S. HRG. 113–643

REFORMING AMERICA'S OUTDATED ENERGY TAX CODE

HEARING

BEFORE THE

COMMITTEE ON FINANCE
UNITED STATES SENATE

ONE HUNDRED THIRTEENTH CONGRESS

SECOND SESSION

SEPTEMBER 17, 2014

Printed for the use of the Committee on Finance

U.S. GOVERNMENT PUBLISHING OFFICE

94–550—PDF WASHINGTON : 2015

For sale by the Superintendent of Documents, U.S. Government Publishing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
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REFORMING AMERICA'S OUTDATED ENERGY TAX CODE

TUESDAY, SEPTEMBER 17, 2014

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 10:22 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Ron Wyden (chairman of the committee) presiding.

Present: Senators Stabenow, Nelson, Cardin, Bennet, Casey, Hatch, Grassley, Crapo, Enzi, Cornyn, Thune, Isakson, and Portman.

Also present: Democratic Staff: Ryan Abraham, Senior Tax Counsel; Michael Evans, General Counsel; Jocelyn Moore, Deputy Staff Director; Kevin Rennert, Senior Advisor for Energy; and Joshua Sheinkman, Staff Director. Republican Staff: Chris Campbell, Staff Director; Jim Lyons, Tax Counsel; and Mark Prater, Deputy Staff Director and Chief Tax Counsel.

OPENING STATEMENT OF HON. RON WYDEN, A U.S. SENATOR FROM OREGON, CHAIRMAN, COMMITTEE ON FINANCE

The CHAIRMAN. The Finance Committee will now come to order.

Around the world, countries driven by tough global competition, dramatic demographic shifts, climate change, and an investment boom in clean technology are ripping up the 20th-century energy playbook and laying out a new path forward. Our country—with a long tradition of innovation and entrepreneurship—has the opportunity to lead the way.

In order to lead, our challenge is to guarantee that outdated energy policies do not pull America back into the pack. And on our watch, leading the pack on energy—and striving for American energy exceptionalism—means leading the pack on tax reform. Here are a few examples of what leadership will look like.

For the first time, our tax code must take the costs and benefits of energy sources into account. Our committee—on a bipartisan basis—needs to be part of a robust conversation about how best to determine costs and benefits. I believe the list of factors must include considerations that do not always figure in today, such as energy efficiency, affordability, pollution, and sustainability.

Second, it is past time to replace today's crazy quilt of more than 40 energy tax incentives with a modern, technology-neutral approach. Let us clear the hurdles that slow down America's energy innovators, and let us introduce a new level of competition and fairness into the marketplace.

Third, the disparity in how the tax code treats energy sources—and the uncertainty that it causes—has to end. Traditional sources benefit from tax incentives that are permanently baked into law. But clean energy sources are stuck with stop-and-go incentives that have to be renewed every few years.

The Congress has developed a familiar pattern of passing temporary extensions of those incentives, shaking hands, and then heading home. But short-term extensions cannot put renewables on the same footing as the other energy sources in America's competitive marketplace.

Clean energy projects take time to plan, and they take time to finance. The facilities and machinery take years to get up and running, especially with sources like hydropower, geothermal, and biomass. Predictable, level-playing-field tax policies could clear the way for America's clean energy sector to thrive at home and outmatch the global competition that hungrily eyes the multi-trillion-dollar market for energy goods and services.

It is important to recognize, finally, that better tax policy alone does not address all of America's energy needs. Yet energy tax reform has to be part of an overall strategy that moves our country towards a cleaner energy future. That cohesive, overall strategy for American energy is what is lacking today.

That is what, on a bipartisan basis, this committee has to change. I see energy tax reform as a way for the Finance Committee to come together to drive America's energy policy towards a modern, level-playing-field approach. Today's hearing is an opportunity for us to begin to map out the road ahead.*

[The prepared statement of Chairman Wyden appears in the appendix.]

The CHAIRMAN. As is our tradition, we are going to do this in a bipartisan way. Senator Hatch has been very constructive in advancing that. Senator Hatch, why don't you make your opening statement?

OPENING STATEMENT OF HON. ORRIN G. HATCH, A U.S. SENATOR FROM UTAH

Senator HATCH. Thank you, Mr. Chairman. I appreciate you for holding today's hearing. Discussions about our Nation's energy policy are always timely.

It has always been my position that, when it comes to energy policy, we need an all-of-the-above approach. Indeed, there is no such thing as too much energy. We need to encourage energy production across the board, and we need to do so in an effective, cost-efficient manner.

Sadly, this is not the approach we have seen under the current administration. President Obama claims that he supports an all-of-the-above approach to energy policy. However, the truth is that the Obama administration's real energy policy boils down to a belief that fossil fuels are bad, and that the Federal Government should enact policies to punish the production and use of fossil fuels.

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*For more information, *see also,* "Present Law and Analysis of Energy-Related Tax Expenditures," Joint Committee on Taxation staff report, September 16, 2014 (JCX–100–14), *https://www.jct.gov/publications.html?func=startdown&id=4667*.

Just ask the coal miners and consumers of electricity negatively affected by the Obama administration's war on coal. And just look at the administration's Fiscal Year 2010 Treasury Green Book. Regarding the administration's proposal to repeal the provision in our tax code for intangible drilling costs, it states: "To the extent expensing encourages overproduction of oil and gas, it is detrimental to long-term energy security and is also inconsistent with the administration's policy of reducing carbon emissions and encouraging the use of renewable energy sources through a cap-and-trade program."

This approach, in my view, represents a backwards view of our Nation's energy policy. Instead of discouraging the domestic production of oil and gas, we should welcome the recent production increases that we have seen. Increases in the domestic production of oil and gas reduce our dependence on foreign oil and create many high-paying jobs. That being the case, the energy boom in places like the Bakken shale region, as well as the Uintah Basin in Utah, and areas down in Texas that have just been discovered, is something to be supported, not punished.

President Obama's first misguided effort to transform our energy policy came in the form of cap-and-trade. In 2008, talking about his cap-and-trade plan and in a refreshing moment of candor, Candidate Obama stated: "Under my plan of a cap-and-trade system, electricity prices would necessarily skyrocket."

After the 2008 elections, Speaker Pelosi rammed President Obama's wrongheaded cap-and-trade proposal through the House, and nothing further was done with it. Proponents of a cap-and-trade approach have, for the most part, acknowledged that this proposal is dead. However, instead of admitting failure and moving on, they are repackaging cap-and-trade by calling it a carbon tax.

I am no marketing expert, but if you could not sell the American people on a bad idea, adding the word "tax" to it is not going to make it look any more appealing. Raising the price of electricity, natural gas, and gasoline does not sound like a good idea to most hard-working, middle-class Americans. Yet, that is precisely what a carbon tax would do.

My view on this is simple: if you really want to pursue a policy that ships jobs overseas, enact a carbon tax. If we purposefully enact policies to make energy—something every business needs—more expensive, American businesses and jobs will go to China, India, and elsewhere. It is just that simple.

Cap-and-trade and the carbon tax are not the only bad ideas out there. In addition, over the last few years, we have seen the administration's continued refusal to approve no-brainer energy projects like the Keystone Pipeline. Our entire pipeline infrastructure needs to be updated and enhanced, yet the Obama administration continues to sit on its hands.

In December 2014, then-Chairman Baucus put forward an energy tax proposal that he claimed was technology-neutral. However, by picking carbon emissions as the standard for judging whether a technology would get Federal dollars or not, the proposal is biased against fossil fuels such as coal, oil, and natural gas.

Now, as we all know, many of our Nation's energy tax issues are addressed in the tax extenders package, which is one of the many

reasons why it is so important that Congress act as soon as possible to pass that legislation. I hope we can do it in the lame duck session.

We did our work on the extenders package here in the committee. I will not go into the particulars of what happened on the floor with that bill—if I did, we would likely be here all day. Instead, I will just say that we need to set partisanship and political gamesmanship aside and get the extenders package across the finish line as soon as possible.

Ultimately, when we turn to tax reform—hopefully soon—I believe we need to examine all existing tax provisions, including energy tax provisions, under President Reagan's three criteria for tax reform: fairness, simplicity, and efficiency.

Looking at the witnesses, it is clear that we have a good representation of different viewpoints about the various energy sources addressed throughout the tax code. My hope is that this hearing will contribute to our tax reform efforts.

I want to thank you, once again, Mr. Chairman, for holding this important hearing, and I really look forward to hearing what this panel has to say about all these things.

The CHAIRMAN. Senator Hatch, thank you, and you make a number of important points. I especially want to support the urgency that you are conveying with respect to the extenders package.

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

The CHAIRMAN. Colleagues, as you know, this was something we did in a bipartisan way in the committee. Just this past Monday, we had scores of businesses all across the country—because they had to make another quarterly tax payment—in effect, making an interest-free loan to the government because it has not been possible to do what Senator Hatch talked about, which was to get this extender package passed and signed into law. So I appreciate your making those points and look forward to working with you.

We have an excellent panel of guests, including the Honorable Don Nickles, president and CEO of the Nickles Group here in Washington; Mr. Norman Augustine, retired chairman and CEO of Lockheed Martin in Bethesda; Dr. Gilbert Metcalf, professor of economics at Tufts; Mr. Ethan Zindler, head of policy analysis for Bloomberg New Energy Finance; and Dr. David Kreutzer, research fellow in energy economics and climate at the Heritage Foundation. We welcome all of you.

You can see there is substantial interest among Senators. We would like you to try to keep your opening remarks to 5 minutes or so. We will make your prepared remarks a part of the hearing record in their entirety, and it will leave us plenty of time for questions.

We now have a veteran of this committee, appropriate to begin with. Mr. Nickles, welcome.

STATEMENT OF HON. DON NICKLES, PRESIDENT AND CEO, THE NICKLES GROUP, LLC, WASHINGTON, DC

Senator NICKLES. Mr. Chairman, thank you very much. It is a pleasure to be before this committee with you and other former colleagues as well as new Senators whom I did not have the pleasure

of serving with. I think it is the best committee in the Senate, and I served on a lot of them. I enjoyed this committee more than any other.

Issues before this committee are actually why I ran for Senate back in 1980. Congress passed a bad law called the Windfall Profits Tax. That motivated me to run for Senate more than anything else, and probably made the difference in my election. It basically taxed domestic production but did not tax foreign imports, and therefore it encouraged imports and discouraged domestic production. It was really a bad, bad idea. It took 9 years, but we eventually repealed it—I was very proud of that. Tax policies matter, and this committee can make a difference.

Mr. Chairman, you mentioned having a tax policy that is neutral among fuels, and I have to take issue with that a little bit. You cannot afford to make fossil fuels' tax equal to the enormous subsidy that wind currently receives. Everybody knows wind receives a credit—it says in your report 2.3 cents per kilowatt hour. What your report does not say is, that is equal to 40, 50, even 60 percent of the wholesale price of electricity.

If you wanted to have something comparable for oil, you would need a $50 or $60 a barrel subsidy for oil. You do not want that—or $2 for gas—we cannot afford it, and nobody asked for it. So there is no comparison. The 1-year extension of the Production Tax Credit is $13.3 billion. That is enormous, and it is too much.

I was here when the PTC passed. I remember people saying it would jumpstart the industry. Well, the industry has been jumpstarted. It has done quite well. Some people say it can stand on its own. It is time for it to stand on its own. Enough is enough.

And who benefits from the PTC subsidy? Mr. Buffett—who is a big wind investor—has said of wind energy: "We get a tax credit if we build a lot of wind farms. That is the only reason to build them. They do not make sense without the tax credit."

His MidAmerican Energy Company is collecting wind subsidies based on their installed capacity. If they operate at 30 percent of capacity, then this year alone he will receive $138 million in tax credits. That is 1 year. Over 10 years, that is more than a billion dollars. I will bet you that, over 10 years, that number is a lot closer to $2 billion. Well done Warren Buffett, a good investor taking advantage of an over-generous tax credit that Congress passed. But enough is enough, and the PTC does not need to be and should not be extended forever.

The credit has been on the books for 22 years. I was here when people said, "It will be temporary. We just need a jumpstart." I do not fault that reasoning, but the jumpstart has occurred.

To make matters worse, when the PTC was extended 2 years ago, Congress lessened requirements to qualify for the tax credit. Instead of a wind farm placed in service to qualify, all you had to do was start construction. Then the IRS came up with a new regulation and said you only have to invest 3 percent to qualify for the PTC. So you invest 3 percent and you are going to get 10 years' worth of tax credits. Wow. This is an enormous, way too generous subsidy. It is crowding out a lot of other fuels.

I know some of the proponents say that it creates a lot of jobs. For every job that it creates, it is costing more jobs in other energy

sectors: natural gas, coal, or nuclear power. Wind blows in some areas where they do not need the energy, but wind producers—selling not to the marketplace but only for the tax credit—and other energy producers actually receive negative prices.

You cannot start and stop a nuclear power plant. Gas plants are not made to stop and start every few hours. It really is absurd how wind is distorting the electric grid and the marketplace.

I mentioned the idea of having tax parity—well, do the oil companies have unfair advantages? No. Intangible drilling costs are out-of-pocket expenses. That is not a subsidy. That is not Uncle Sam writing a check. Most of that is wages. Any business, in my opinion, should be able to deduct wages in the year they occur. I do not look at that as a subsidy.

The other big subsidy is section 199. That is a differential on manufacturing taxes. Wait a minute. Oil and gas companies actually pay a higher corporate tax rate than all other manufacturers. When Congress passed a differential tax on manufacturers, I argued against it. I think we should have one uniform corporate tax rate. Right now you have a 35-percent rate for most corporations, 32 percent for manufacturers, and 33 percent for oil companies. It should be uniform.

Mr. Chairman—I compliment you for this—you have been working on reforming the tax code for a long time. I do hope that this Congress will work together to really reform the tax code. It needs to be reformed if we are going to be competitive internationally. It needs to happen.

One other little piece of advice—I compliment the chairman—when you marked up the extenders bill, you had a markup. Members on both sides offered amendments. That is the way it is supposed to work. That is the way it happened when I was on this committee, and it worked.

We also amended bills on the floor. Tax bills, budget bills, and so on were allowed amendments on the floor. I think if that is done, it would restore comity in the Senate. I think it would restore respect to the Senate. All members would get to participate and have an opportunity to voice their ideas. The amendment process—the democratic process, quite frankly—would work, and the Senate would no longer be the dysfunctional group that I am afraid that it has turned out to be the last few years.

I encourage you to take bills to the floor and offer ample opportunities for all sides to offer amendments. I think it would really help the system.

The CHAIRMAN. Thank you very much. I know we are going to have questions in a moment.

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

The CHAIRMAN. Mr. Augustine?

STATEMENT OF NORMAN R. AUGUSTINE, RETIRED CHAIRMAN AND CEO, LOCKHEED MARTIN CORPORATION, BETHESDA, MD

Mr. AUGUSTINE. Well, thank you very much, Mr. Chairman and members of the committee. My remarks today will be based on the work of the American Energy Innovation Council, of which I am a member. We refer to it as the AEIC. I appear as an individual

today. I believe my views, though, do represent those of the other members of our council.

The AEIC has a somewhat interesting background. About 5 years ago, seven of us, who were then CEOs or former CEOs of major non-energy companies, were discussing our concern over the Nation's energy situation and concluded that we had—in our careers—to make some tough decisions and that perhaps we could be helpful in making suggestions with regard to energy. We have been supported by the Bipartisan Policy Council founded by colleagues of yours, Senators Baker, Daschle, Dole, and Mitchell. We represent no other organization. We are just a group of individuals who are very informal. Our membership is listed in my written statement.

The focus to date has been on research and development, which is where the answers to so many of the questions in energy production reside. The search for answers to those questions certainly depends on an enlightened tax policy. I would emphasize that I am an engineer, not an economist. Tax policy is not my forte. On the other hand, the members of our group are business persons who, of course, have had some experience in the practical aspects of tax matters.

Very few issues have greater importance for the Nation's well-being than our energy policy, whether it be the impact of foreign sources of energy making us vulnerable to geopolitical coercion in peacetime, the impact on open conflict, the impact on the natural environment, and certainly the impact on the economy as a whole, especially including jobs.

The AEIC has published two reports and a number of case studies. The first of those reports pointed to the need for greater investment in energy R&D. Today that is less than ½ of 1 percent of the Nation's energy bill, which makes it clearly an outlier as compared with other disciplines. The second report dealt with the role of the government in resolving these energy challenges. Aside from the more conventional roles such as regulation and enforcement, the government has an especially important role in energy in terms of providing certain kinds of funding, participating in some efforts itself, and assisting in the implementation of many of the new concepts that have been brought out.

We particularly emphasize the importance of the government supporting basic research and also helping corporations get through the two valleys of death that financial folks refer to when trying to introduce new ideas through technology. The first of these valleys of death would be the time between the discovery of new knowledge and the proof of principle and a prototype. The second—which is particularly important in the energy area—is the matter of going from a prototype, a feasibility prototype, into a full-scale viability demonstration, including the economics of the concept. The second is particularly challenging in the energy area because of the major costs of new infrastructure and the longevity of that infrastructure.

With regard to tax policy, there are certain features that we believe are important. One is that—clearly—we encourage the development of clean, affordable, sustainable domestic energy sources. The second is that we seek to be technology- and energy source-

sensitive in our tax policy—that is, focused on outcomes, not on input constraints—and not de facto favor any particular source or technology.

We think it is very important that our tax policy be predictable. If there is anything people in business dislike, it is uncertainty. We believe, on the other hand, that tax policy should not be permanent in this area. It should be open for review, but without sudden changes.

Energy tax modification, in our view, takes place best in an environment of overall tax reform. That is so that we can avoid non-optimized tax policies.

In conclusion, as you might suspect, my colleagues and I on the AEIC are very strong proponents of the free enterprise system. At the same time, there are some things that the free enterprise system cannot or will not do. Among those in the energy area, certainly, is investing in very high-risk, very long-term, uncertain payoff research. That is a role where the government would seem to need to intervene.

The other area would be dealing with these areas referred to as valleys of death, where work that is of the public interest needs to be accomplished, but the financial markets that exist today simply will not permit industry to undertake those projects, all of which makes government involvement extremely important, including maintaining a stable, unbiased if you will, tax policy.

Thank you very much. I will be happy to answer any questions you might have.

The CHAIRMAN. Mr. Augustine, thank you very much.

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

The CHAIRMAN. Our next witness will be Dr. Gilbert Metcalf. Doctor, welcome.

STATEMENT OF GILBERT E. METCALF, Ph.D., PROFESSOR OF ECONOMICS, TUFTS UNIVERSITY, MEDFORD, MA

Dr. METCALF. Chairman Wyden, Senator Hatch, and members of the committee, thank you for the invitation to testify on reforming the energy tax code today. I am a tax economist and teach tax principles at Tufts University, so let me began with three design principles for thinking about reforming the energy tax code.

First, energy tax policy should address the unequal playing field that results from not recognizing the social cost of pollution in energy tax production and consumption. A tax on pollution internalizes the externality so that firms take into account the social costs of pollution. This approach implicitly makes clear that pollution-generating activities have social benefits as well as costs. An optimal policy must balance those costs against the benefits, and a tax is an efficient means of effecting that balance.

Alternatively, a subsidy to clean energy production can also level the playing field between clean and dirty energy in terms of ensuring that the private cost of energy between fuels reflects the differentials due to pollution externalities.

In addition to using the tax code to level the playing field between clean and dirty energy sources, good policy will provide sta-

bility and clarity in the tax code, important design principles given the long-lived nature of most major energy capital investments.

Finally, policy should be designed to avoid giving tax benefits to firms or individuals for activities they would have undertaken with or without the tax incentive. Such inframarginal activities reduce the bang for the buck for any given policy.

So let me address these design principles in the context of greenhouse gas emissions, given the important role the energy sector plays in contributing to those emissions, and given the importance of addressing climate change. Economists associated with both the Republican and Democratic parties have long advocated using a carbon tax to reduce greenhouse gas emissions.

In a recent analysis, I modeled a $20-per-ton carbon tax and estimate that it would raise roughly $100 billion dollars annually in the initial years. This would provide sufficient revenue to lower the payroll tax by roughly 1½ percentage points or the corporate income tax by 8 percentage points.

These examples highlight that carbon revenue provides fiscal flexibility to contribute to a comprehensive tax reform package focusing on efficiency and equity improvements while maintaining overall budget neutrality for the Federal government. The fiscal benefits are clear. However, as they say in the late night infomercials: "But wait, there's more."

With the carbon tax in place, the various renewable energy tax preferences could be eliminated, as could oil and gas preferences including, among other things, percentage depletion and expensing of intangible drilling costs. Eliminating these subsidies provides another $30-plus billion over a 5-year budget window that could be used to finance further reductions in marginal tax rates or other tax reform initiatives.

But wait, there's more. A stable and well-designed carbon tax would make the EPA's Clean Power Plan unnecessary. This would provide additional administrative and efficiency cost savings.

All taxes involve dead-weight loss, and a carbon tax is no exception. We live in a world in which we require tax revenue to fund important government activities. When given a choice between taxing goods—capital and labor—or taxing bads—pollution—I favor the latter. A wealth of economic analysis supports this view. In general, reputable studies of carbon taxes, including the Energy Information Administration's various analyses, find modest and negligible economic losses from a well-designed carbon tax.

Despite the efficiency benefits, as well as the revenue benefits of a carbon tax, it is clear that this policy would be a major political lift in Washington right now. Given that fact, well-designed tax preferences for clean energy production are a reasonable second-best policy to level the playing field.

A preference-based energy tax reform should consist of two elements. First, the tax preferences for coal, oil, and gas should be repealed. Repealing these incentives would level the playing field between oil and gas and coal assets and other physical assets. In other words, we would apply income tax principles to these goods and services.

Second, a tax credit for clean energy production or investment should be based on principles of technology neutrality. And here

the Senate Committee on Finance chairman's staff discussion draft from last December takes a number of important steps in the right direction, by reducing the number of incentives; focusing on measuring results rather than rewarding particular technologies; and eliminating the policy uncertainty that results from the need to reauthorize tax preferences regularly, while ensuring that clear and transparent benchmarks are set so that the policies may phase out as they are no longer needed.

Such an approach would provide greater clarity and rationality to the current tax code. While an improvement, it is not as efficient as a carbon tax, but, given that we are operating in a second-best world, this approach would likely provide significant gains in low- and no-carbon energy provision at a cost-effective price.

Thank you for this opportunity to speak, and I look forward to your questions.

The CHAIRMAN. Thank you very much.

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

The CHAIRMAN. Mr. Zindler, welcome.

STATEMENT OF ETHAN ZINDLER, HEAD OF POLICY ANALYSIS, BLOOMBERG NEW ENERGY FINANCE, WASHINGTON, DC

Mr. ZINDLER. Good morning. Thank you, Chairman Wyden, Senator Hatch, and the committee staff, for this privilege today. It is truly an honor to be before you and offer my thoughts.

I join you today in my role as an analyst with Bloomberg New Energy Finance, which is a market research division of Bloomberg LP focused on the transitions underway in the global energy markets. Our firm's clients include financiers, energy equipment makers, independent power producers, utilities, oil majors, nongovernmental organizations, and government agencies in over 50 countries—in short, folks who want to make money investing in new energy technologies.

My remarks today represent my views alone, not the corporate positions of either Bloomberg LP or BNEF. I invite the committee to review the accompanying slides I have submitted as I read my remarks. I will focus my comments today on how the two largest U.S. non-hydro renewables sectors, wind and solar, are impacted by their respective tax credits. I recognize there are a number of other intriguing ideas on the table about reforming the tax code, including the Baucus white paper from last year and the ideas that Gib just mentioned as well. I look forward to talking about these during the Q&A.

Let me start by making two basic assertions. First, the energy sector is in the midst of a fundamental transformation. How we produce, deliver, consume, and even think about energy are all changing rapidly and, I would argue, irreversibly. And second, these trends, which began in the last decade and picked up steam in the past 5 years, are going to continue over the next 2 decades. This is inevitable thanks to incredible advancements in natural gas extraction, declines in solar module prices, improvements in wind turbine technology, and greater connectivity and intelligence of electricity-consuming devices and of the grid itself—to name just four changes.

Since 1992, the Production Tax Credit has played a vital role in subsidizing and spurring the construction of U.S. wind projects. The PTC's current $23 per megawatt-hour benefit coupled with accelerated depreciation benefits has allowed wind capacity to grow nearly ninefold since 2009. The PTC's importance has been illustrated each time Congress has allowed it to lapse. Each time, installations have fallen sharply. Last year we saw the sharpest fall of all.

Today, the PTC remains officially off the books, meaning that new greenfield projects generally do not qualify for the project. However, due to a critical change in the 2012 Taxpayer Relief Act, the credit continues to have important market impact. That change effectively allows most projects that began but did not complete construction before the credit sunset to still qualify. This adjustment has helped to sustain the wind industry this year and will continue into 2015. In all, we anticipate 15 gigawatts of new capacity will be installed in the U.S. in 2014 and 2015, marking a significant rebound from last year, when just 1 gigawatt was installed.

So, what happens if Congress does not extend the credit? In our view, the market will, as it has in the past, experience a sharp decline in activity, potentially resulting in layoffs for manufacturers with operations on U.S. soil. A somewhat similar cliff now looms for the solar sector, which enjoys the benefit of the Investment Tax Credit allowing developers to receive a credit equal to 30 percent of their project's capital expenditures.

The ITC is now due to sunset at the end of 2016. At that time, when the ITC steps down to 10 percent, we anticipate another drop in solar installations similar to what we have historically witnessed with wind. One option that has been proposed has been for the ITC to adopt the same placed-in-service language as the PTC. Such a move would—in our view—help sustain the solar industry longer-term.

Critics charge that these tax credits provide little motivation for these nascent sectors to improve their economics and become price-competitive. But recent evidence suggests that the wind and solar industries are rapidly reducing costs, in large part, to compete with natural gas-fired generation.

In the case of solar, the cost of a photovoltaic panel today is 50 cents a watt approximately, by our calculation, compared to over $3 a watt as recently as 2008. This has created areas in the U.S. where so-called "socket parity" now exists for new solar. That means, for a new homeowner or a business owner, it can actually make more economic sense to put a system on their roof in the long run than to pay the utility for the power that they would otherwise receive.

In the case of large-scale solar projects which are connected into the utilities, we have seen prices associated with power contracts decline recently in the last few years. There is a slide associated that demonstrates that. The main reason for this has less to do with technology and more to do with economies of scale, as the PV industry is now 10 times the size it was just 5 years ago. Similarly, wind generation costs have dropped in recent years, though in this case the reasons have more to do with technological advancements.

Further improvements are coming, in our view. These technologies will not stop evolving, and their costs will not stop declining. For this reason, we project that wind and solar will ultimately account for at least 20 percent of all capacity in the U.S. by 2030. This may sound ambitious, but on a generation basis, which is the actual number of megawatt-hours that get generated, we anticipate that coal, gas, and nuclear will still meet the large majority of demand by 2030. And no, I should point out, our forecast does not assume that these tax credits are extended. We think this is going to happen anyway.

In closing, I would just reiterate my two basic points: (1) major changes in the energy sector are upon us, and (2) these are going to continue through 2030 as the trends set in recent years continue. Thus, the question becomes, what role will the U.S. play in this revolution? Will the U.S. market follow a smooth or rocky path toward clean energy deployment? Will the U.S. be a market-maker or price-taker? Will the U.S. primarily be a clean energy equipment importer or exporter?

Inconsistent and unpredictable short-term policy-making will not fundamentally undermine the long-term changes underway in the energy sector worldwide. These are now inevitable, thanks to technological innovation, economies of scale, and yes, policy support coming from many nations around the globe, including, most notably, China. But inconsistent policy-making can impact the role the U.S. plays in this change. Thus, the decisions Congress makes on certain aspects of the tax code today could have far-reaching implications for U.S. competitiveness tomorrow.

Once again, I thank the committee for this opportunity, and I look forward to your questions.

The CHAIRMAN. Thank you very much.

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

The CHAIRMAN. Dr. Kreutzer?

STATEMENT OF DAVID W. KREUTZER, Ph.D., RESEARCH FELLOW IN ENERGY ECONOMICS AND CLIMATE CHANGE, CENTER FOR DATA ANALYSIS, THE HERITAGE FOUNDATION, WASHINGTON, DC

Dr. KREUTZER. Chairman Wyden, Ranking Member Hatch, and other members of the committee, I want to thank you for giving me this opportunity to speak to you today about energy tax policy.

My name is David Kreutzer, and, at the risk of embarrassing a staffer, I want to point out it is "e" before "u." I only mention it because that misspelling grows like kudzu when it gets into records, and it is hard to extinguish.

The CHAIRMAN. David, we will make sure it is expunged.

Dr. KREUTZER. All right. I appreciate that. [Laughter.]

I am a research fellow in energy economics and climate change at the Heritage Foundation. However, the views I express are my own. They should not be construed as representing any official position of the Heritage Foundation.

I want to make several points regarding carbon taxes. First, carbon taxes do economic damage. As was mentioned by my colleague to the right, there is with every tax something called excess burden or dead-weight loss. It is true with a carbon tax.

If you look at the numbers on the carbon tax, when I talk about the damage, I am getting these estimates from three analyses of carbon taxes: two done by the Energy Information Administration and one done by us at Heritage using a clone of their energy model, which is described in the appendix of my written testimony.

I do not find those impacts to be moderate. In the $20-per-ton carbon tax case of the Boxer-Sanders bill that we analyzed at Heritage, the peak year job losses were 400,000; that is, employment fell more than 400,000 jobs below the baseline that we would have had without a carbon tax. I do not find that moderate or trivial.

GDP losses for all three analyses of the carbon tax by 2030 would be measured in trillions of dollars, which comes out roughly to, if you want to look at a nominal family of four, in the order of $1,000 per year. I do not think that is moderate or trivial.

And you do not get these losses back. With all of these models, the economy recovers at some point. But you have people being employed at worst jobs. If you look even at the EIA's analysis, even going out to 2040, which I think is a bit too far for much belief, we still have GDP $140 billion or so below the baseline, which is the equivalent of the GDP generated by a million people. So you have a million people working for nothing.

So, carbon taxes do damage to the economy in ways that simply cannot be avoided—you cannot slice the pie differently and not have those damages.

Second, I want to point out that I do not think you can justify these carbon taxes by the impact they will have on world temperature. The carbon tax that the EIA has analyzed in their Annual Energy Outlook 2014 would cut carbon dioxide emissions from power generation by about 50 percent by 2050.

If you look at a carbon tax calculator that has been created to look at how much that would affect world temperatures, the best guess is it would cut world temperature by the end of this century by ½ of 1 degree centigrade. That would be about .09 degrees Fahrenheit, less than one-tenth of a degree Fahrenheit.

Some people say, well, that is just the first step. Well, if you cut it by 50 percent, there is only one step left after that before we have to hold our breath. If you are looking at trying to get other countries to come in to join us because we are providing some sort of leadership, you would only have to look at this week's Climate Summit at the UN to see the leaders who are not showing up from India, from China, from Germany, from Australia, from Canada, to get an idea of what our leadership is likely to bring.

Third, I would like to talk about the social cost of carbon. The social cost of carbon is generated from three fairly sophisticated computer programs that at their core are fundamentally vacuous. They are flawed, and they do not give us numbers that are meaningful.

At the Heritage Foundation, we have installed two of those programs. The third program, the proprietor refuses to allow anybody to publish anything on using his model—and that is the PAGE model—without the right of co-authorship, which eliminates the possibility of having independent analysis.

The two we looked at—they are used by the EPA to estimate the social cost of carbon, which is driving the cost benefit analysis for

virtually all of their carbon regulations—did not even use the OMB guidance for the discount rate that you need. The social cost of carbon estimates look at—supposedly we are able to calculate economic damage from climate warming 300 years down the road, in the year 2300.

I think it is unlikely we know what is going to happen to the climate in 2300, and even less likely that we know what is going to happen to the economy because of the climate in the year 2300. But they pretend to make that measure anyway.

It is important to use the right discount rate. The OMB gives guidance for 3 percent and 7 percent. The EPA and the interagency working group did not use the 7 percent.

What happens if you use the 7 percent rate? One of the two models that we used, the PAGE model by Richard Tol, actually goes negative. So, if you believe the logic here of getting the markets to balance things properly, as Professor Metcalf has pointed out, that would imply we should subsidize CO_2 emissions. Now, I do not know that we want to use a tool that cannot decide whether we should subsidize CO_2 emissions or tax CO_2 emissions to drive CO_2 tax policy.

In summary, carbon taxes do damage to the economy. All the carbon taxes that I have seen proposed would have, at most, a negligible impact on world temperatures. And the social cost of carbon is not a tool that is ready at this point to be used for serious regulatory analysis.

Thank you very much.

The CHAIRMAN. Thank you very much.

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

The CHAIRMAN. Before we get to questioning, colleagues, there is an important bit of committee business that needs to be done.

Senator Grassley turns 81 today. Senator Hatch and I have decided, knowing of his enormous affection for Dairy Queen, we are getting him a gift certificate. Some of you may want to honor him in different ways, but I just wanted all of our colleagues to know.

Now, with respect to Senator Nickles's comments, I want to pursue a different line of questioning before this sparring back and forth, with respect to renewables and fossil fuels, goes too far.

Until recently, I chaired the Senate Energy Committee. I come from a State without a drop of fossil fuels. My first hearing was on natural gas, which kind of shocked and amazed everybody. The reason I did it is that I am not interested in this sparring back and forth and back and forth, because I want us to advocate a technology-neutral kind of policy.

Here is what concerns me. Right now, given the fact that the wind Production Tax Credit has expired, if you start a new wind farm now, you get nothing because the Production Tax Credit has expired. If you start a new oil-drilling operation now, you get access to the permanent subsidies. So this is—and, Senator Nickles, you are right to say—this is going to be a part of the tax reform debate. Senator Hatch and I are going to pursue these issues in a bipartisan way. They were central to coming together with Senator Coats on the bill.

So I want to start with the clean energy sector and my comments earlier. I talked about something I think we can all come together on, and that is America leading the pack in what I call "American energy exceptionalism." I want to apply that principle to the clean energy sector. In my statement, I talked about what are we going to have to do to thrive at home and particularly to beat the global competition, because this is a market for energy goods and services that is estimated as a multi-trillion-dollar market.

Let us start with you, Mr. Zindler, because you come from exactly that field. Looking at the energy markets, looking at the potential—I am going to give everybody a chance to do this, but, if you got a chance to look at one policy change that would be market-oriented for us to tap the potential for the clean energy sector here at home and around the world, what would it be? You start us, Mr. Zindler.

Mr. ZINDLER. Well, it is a very good question. There are a variety of them, I would say. It does strike me that something that tries to take into account—let us just back up for 1 second.

Our perspective globally is, frankly, fairly optimistic, like you see here for the U.S. We think we are going to see a lot more adoption of clean energy technologies in countries around the world. In fact, the rates of adoption in the developing world are probably even going to be faster, because some of them have the best natural resources for wind and solar. A number of them have hundreds of millions of people who are not on the grid.

The cost of solar is even more competitive when you are talking about literally putting a system on somebody's roof as opposed to having to build a hub and spoke type of delivery system. It is somewhat analogous to what is going on with telecom and with not building hard landlines for telephones in a lot of these countries.

So we think that the opportunity is enormous. The growth rates that we are seeing in the developing world are enormous.

So then the question is, if you want to be a competitive country in trying to service these nations and export, what can you do to be supportive? I am, sort of, of the view that, to some degree, where we are now is a very interesting point and that a lot of these technologies are close to competitive on their own without subsidies, but not there yet in many parts of the world.

So the real question is—and this gets to what Norm Augustine was saying—what do we do to support the next generation of technologies, the ones that are going to be down the road, the ones that my chart shows taking over the world 5 or 10 years from now? How can we support them through greater R&D, whether it is tax credits or whether it is grants or other types of things? From the U.S. competitiveness perspective, from my perspective, a lot of what you would want to think about in terms of long-term competition are things that support technology under development now but also technology that will make an impact in about 5 or 10 years from now.

The CHAIRMAN. Why don't we see if we can get Mr. Augustine in on this, and then somebody who disagrees with Mr. Zindler and Mr. Augustine.

Mr. Augustine?

Mr. AUGUSTINE. Thank you. I would focus on increasing the Nation's investment in research and development in two ways.

The first would be to substantially increase the research budget that is supported out of the Department of Energy. I would single out ARPA–E * as an example. It is badly underfunded for its potential.

The second thing would be to make the R&D tax credit permanent. Make it outcome-focused rather than having any built-in biases one way or the other in terms of technology resources.

The CHAIRMAN. Well, there is a lot of interest, as you know, Mr. Augustine, in this committee in making the R&D tax credit permanent.

Nobody is required to disagree with Mr. Zindler or Mr. Augustine. Does anybody want to?

Dr. KREUTZER. Yes. I just want to add a little bit. I also taught economics and tax policy for 26 years at Ohio University and later James Madison University.

The definition of net income or profits that we use in the tax code is one that was actually developed for owners and potential owners of firms to get an idea of what the situation for their firm was. It is not a good definition for tax policy.

For instance, using an example that Senator Nickles brought up, if I buy a ream of paper to use in the office headquarters, I get to deduct that 5 bucks from this year's tax. If I buy a ream of paper to use in the printer in the trailer out at the drilling site, then it is an intangible drilling cost. If you get rid of that deduction, I have to expense that $5 ream of paper that is identical to another one used somewhere else in the company for—who knows—15 or 20 years.

It makes much more economic, straightforward sense for tax policy, I think, to have expensing for everything. I think that would promote all sorts of investment. You would not have to worry about whether you get to deduct it in 5 years, or 3 years, or 2 years. You get to take it off now.

I think people would understand—if I spent $5 buying something, I should be able to take that off of my revenue for this year.

The CHAIRMAN. I am well over my time.

Senator Hatch?

Senator HATCH. Well this has been a very interesting panel, as far as I am concerned. Let me ask this question for Dr. Kreutzer and Senator Nickles.

A number of tax policy experts believe that the tax system should only be used to raise the revenue necessary to fund a constitutionally limited Federal government, and that we should not get involved in social engineering through the tax code. Now these experts suggest that energy policy should not be run through our tax code as part of the tax reform exercise of lowering tax rates. This is one approach to dealing with energy tax provisions. I would like to have both of your thoughts on such an approach to energy tax reform.

Senator NICKLES. Well, Senator Hatch, just a couple of comments. If you do really good tax reform, you do not need energy tax

*The Advanced Research Projects Agency—Energy.

issues. Let the marketplace work. By that I mean, allow expensing where expensing makes sense. Everybody is talking about subsidies, and I keep hearing people mention subsidies for the oil industry. Basically, you are talking about expensing. You are talking about expensing out-of-pocket costs that are non-recoverable, most of which are wages.

I have always said—I have said it on both sides of this table—everybody in any business should be able to expense their wages. They should not, in my opinion, get a tax credit for the wages. That is Uncle Sam writing a check. There is a big difference between a tax credit and expensing.

That is what is wrong about the Production Tax Credit. It is a tax credit. Uncle Sam is writing a check to enormous investors, some of whom are billionaires, to produce products. That is an enormous subsidy—absurdly large—in comparison to allowing somebody to deduct their out-of-pocket expenses incurred.

So I hope, when you are doing overall tax reform, you will keep that in mind. You can always debate how long we should amortize something, whether it is a pipeline, a building, you name it. We have different amortization schedules for everything.

I have always believed that the shorter you can keep that time—allowing people to deduct what they wrote a check for—makes good sense. What does not make sense is having Uncle Sam write you a check that pays 30, 40 even 50 percent of the value of the commodity. Unfortunately, that is what happens with the wind Production Tax Credit.

Senator HATCH. Dr. Kreutzer?

Dr. KREUTZER. I think having it done through expenditure is probably a little bit cleaner and more up-front. You are seeing the dollars actually spent for the various projects.

I am probably willing to subsidize many fewer things than most of the people in the room or on this panel. I agree with Senator Nickles. I think the market works pretty well in this regard. I do not see many valleys of death that are followed by something other than great plains of death and mountains of death on the investment.

If an investment is a good idea, we see it being made. We see George Mitchell for years and years putting his money behind the technology that allows us to get to the shale gas, which he did primarily with his own money.

So I think it is a good idea to simplify the tax. I think if you went to straight expensing, you could turn K Street into public housing. There would be no need for three-fourths of the lobbyists in this town, because so much of it is based on, should we accelerate it 3 years or 5 years or whatever.

I agree in general. I think it is better to do expenditures for things you want to promote instead of trying to jimmy it up.

Senator HATCH. Let me ask you another question, Dr. Kreutzer. What economic effect would a carbon tax have on U.S. workers, businesses, and consumers, in your opinion?

Dr. KREUTZER. As I say in my testimony, it would be negative overall. We would see some significant damages, especially in manufacturing, obviously in the energy-intensive sectors. The reason for this is that 85 percent of the energy that we get in the U.S.

is based on hydrocarbons. So a carbon tax is going to hit all of them. It will hit coal heavier than petroleum, and petroleum heavier than natural gas, but it is going to hit all of that 85 percent.

We will see families of four—again, a nominal family of four—facing $1,000 per year of lost income. That does not come back.

Senator HATCH. I got that. Let me ask this question for everybody on the panel.

Congress is in the process, once again, of extending certain expiring tax provisions, more commonly known as tax extenders. In the context of tax reform, I am curious if anyone on the panel believes we should set up a system whereby energy tax provisions are either made a permanent part of the tax code or dropped altogether. In other words, should we get out of the business of enacting temporary energy tax provisions?

Senator NICKLES. I definitely think so. I think they have had their time. Enough is enough. Some of these subsidies, as I have mentioned, are really not affordable, and they have distorted the marketplace in the electric sector significantly.

I am amazed going through the list of all of the tax provisions that are there, absolutely amazed. I know you all have a difficult job. I know you have to deal with extenders. I happen to favor expensing. I have already mentioned that. That is one of the extenders.

I am a small businessman. You could make me amortize that computer over 2 years, or my cell phone over 2 years, or the paper I buy over 2 years. I am able to expense it. I think that makes good sense. I do not look at that as a subsidy. I had to write a check for that. I think I should get the deduction, but to receive tax credits for all of these various different energy provisions does not make sense. Uncle Sam does not write checks for drilling companies to drill wells.

I am on the board of a big refining company, Valero. Uncle Sam does not write checks for us to be refining. People talk about all of these subsidies as if they apply to fossil fuels as well as to renewables. There is a big difference, and I take issue with that.

Senator HATCH. All right. Mr. Augustine, and then I would like—if you could keep your answers fairly short, I would appreciate it, because my time is up.

Mr. AUGUSTINE. Yes, I think it would be proper to reflect the views of my group that we would not favor temporary tax provisions in general. We would favor phasing them out over a period of time. Sudden changes are disruptive.

The problem with temporary provisions tends to be that they cause management to act in ways that are not optimal in the long term. I would point out, though, that there are other investments that would be important for the government to make.

Senator HATCH. Dr. Metcalf?

Dr. METCALF. So I think you want to fish or cut bait. You want clarity and permanence. So I think temporary provisions are not good, but whether you have them or not depends on how you want to address the problems that we face in terms of the unlevel playing field because of the social cost of fossil fuels.

One comment on expensing: if we were at a hearing on a consumption tax versus an income tax, I think I would be a great fan

of expensing as a principle of consumption taxation. But we do have an income tax by and large, and one of the principles of an income tax is that you allocate the costs as you accrue the revenue.

So, if I buy a ream of paper for my business and use it this year for revenue I earn this year, then of course, I take that as a deduction. But the whole principle of an income tax is that we allocate the expenses to match the revenue over time. Of course, a drill rig is earning revenue over time, and so proper tax treatment would call for amortization. So I think we need to be careful what we are calling a subsidy and what we are calling a simple cost of business.

Senator HATCH. Mr. Zindler?

Mr. ZINDLER. I guess I would just echo that. I am having a little trouble with this parsing between expensing and tax credits. In both cases, as I understand as a taxpayer, that means less revenue that is coming in for the American government. Is that the bottom line? They are both subsidies, right? Unless I am missing something here.

[Off mic.]

Mr. ZINDLER. They are not? They do not both result in less tax being collected?

The CHAIRMAN. Let us have Senator Hatch ask the questions and see if we can get colleagues some time here. [Laughter.]

Mr. ZINDLER. I am sorry.

Senator HATCH. I kind of like that. I like seeing the fight going on here. [Laughter.]

Dr. Kreutzer?

Dr. KREUTZER. No. Expensing changes when you pay the tax. You get a tax credit that reduces how much you pay.

I think if we have good tax policy, we want it to be permanent. I think the reason we see the temporary provisions is that so many people think, well, there are a bunch in there that are bad, and I would rather have a bad tax policy be temporary than permanent. So that is the battle.

In general, if you have decided on what is good tax policy, there is no good argument for having it be temporary and renewable.

The CHAIRMAN. Senator Stabenow is next.

I just want to make one point with respect to your comment, Mr. Zindler. What will get us out of the parsing business, this back and forth, is if we can really advance a policy built around technology neutrality. So to the extent any of you can help us do that, that will be constructive.

Senator Stabenow?

Senator STABENOW. Well, thank you very much, Mr. Chairman. This is a very important discussion, I think, in terms of the future of our country in so many ways, in terms of jobs and energy. Thanks to all of you.

Don, it is great to see you again. I am still in your old office, and it is doing well. So, thank you for that.

Let me say though—I am going to challenge you. I want to talk a little bit about oil, because I think you have kind of made light of expensing on oil. The reality is that we have had a permanent tax policy since 1916 in some way incentivizing and supporting oil. As a manufacturing State, I am sure I would have supported that then, and we have seen—at least, in the last 30 years—fossil fuel

energy companies getting subsidies in some form or other, write-offs, worth over $166 billion after being adjusted for inflation. So that is just 30 years. That is not 100 years.

So I would argue for folks who have said, we should not pick winners and losers—well, as I have said before, we picked a winner, and they won. So now the question is, can we create more competition for different kinds of energy and create a policy that makes sense for all of them? We still have, regardless of the amount, stop-start provisions on alternatives, whether it is biofuels, whether it is wind, whether it is solar, all of which are very important.

When we look at all of the pieces from the section 199 manufacturers' deduction—which I would argue against as a manufacturing State; I would question whether that is manufacturing on the oil and gas side—we have depletion methods, and expensing and amortization periods, and passive loss limits, and deductions for underground injections, and marginal well tax credits, and enhanced oil recovery credits. I mean there are a lot of things that we have done in support of one sector of our energy provision industry. So I think at this point that it is important that we have certainty, even if it is phase-outs, on the rest of it to create a level playing field.

I have to say, Mr. Zindler, you were talking about solar in other countries. I just came from a trip to Africa with a number of members where we saw individual solar units way up in the mountains of Ethiopia where they are still using an ox and a plow, but they have a cell phone and they have solar. It is a very interesting situation, and it is individual units that they are coming in with.

But when we talk about leveling the playing field, I think an interesting policy—and, Mr. Zindler, I will ask you this—is something called master limited partnerships. Senator Coons has a bill that I am pleased to be a cosponsor of that is bipartisan, with Senator Moran and Senator Murkowski, that would take a form of financing that is currently only available for oil and natural gas and coal extraction and pipelines—so fossil fuels—and expand it to alternative energy. I am wondering if you might speak to allowing clean energy sources to use the same kind of financing structure, the MLP structure, and whether or not that would be a good way to open up and encourage investment in clean energy.

Mr. ZINDLER. Thanks for the question. The MLP subject is an interesting one. It is a very complex one, so I will try not to get into too many details.

I will say that the spirit in which that legislation is being pursued, to me, to some degree makes a lot of sense, in the sense that the costs of capital for renewable energy products, typically these days you could argue, are artificially high, in part because they rely on this tax credit system. There are a limited number of players that provide tax equity financing. And in part, that is because investors, these retail mom and pop investors, can invest in the companies that make these technologies, but if you look at those stock valuations, they kind of go up and they go down; they are risky.

There are very few avenues for the sort of mom and pop investors to simply buy a share of an operating wind farm. And those are fairly low-risk investments that can offer cash flows that are

similar to a bond, particularly a high-yielding bond. So the idea of a master limited partnership is one that I think makes a lot of sense for the industry, in that it could potentially open a new pool of capital, make a new pool of capital available to wind and solar and other projects.

One interesting note though is that this idea has been on the table now for, I think, 2½ to 3 years, since Senator Coons first announced it. In the interim, interestingly enough, Wall Street has found a number of interesting ways to try to sort of replicate this in their own way. So there has been this series of so-called yield companies that have been floated over the public exchanges.

What these essentially are are companies that own perfectly well-operating wind or solar projects. They simply put them together, and then they IPO them on the stock exchange. Investors know that they are not investing in Google, they are not investing in Facebook, they are investing in something that will produce a reliable, solid dividend for them in much the same way that a bond or other types of things would. So we have seen market activity to try to actually create an MLP-type world, but there are limits on how effective that could be, and the MLPs offer a further option for public investors.

Senator STABENOW. Thank you. I did not mention one other piece to this story about looking at solar in Africa, and that is that these were individual Chinese units that were highly subsidized and being sold for a very small amount. When we look at China investing $54 billion a year in clean energy technologies to win the race, I worry that if we are not in the race and providing some solid long-term policy, we are going to lose jobs here. We are going to lose jobs in the long run.

So, Mr. Chairman, I know I am out of time. Thank you.

The CHAIRMAN. Thank you, Senator Stabenow.

Senator Enzi?

Senator ENZI. Thank you, Mr. Chairman, and thank you for holding this hearing. As the accountant, I am extremely interested in tax reform. A lot of these details are very exciting for me. I do think that we can make the tax code a lot fairer and simpler, and I am interested in doing that.

I am glad that this is an energy hearing, because energy is Wyoming. We have every kind of energy in Wyoming. The southern part of Wyoming is rapidly growing in wind turbines because Denver is the mile-high city, and you have to go uphill to get to Wyoming. And when you go uphill, you get above the trees. And when there are no trees, there is a lot of wind.

In fact, on the first turbines that were put up there, the rotors blew off. They now have them designed so that when the wind gets to 80 miles an hour, they turn the blades into the wind, so they stop. But if they do not turn fast enough, it blows the whole tower apart. So we are big on wind. We have a lot of sunshine, more days of sunshine than almost anywhere but Arizona, I think.

But for a long time, we have been involved in oil and gas and coal. In fact, 40 percent of the Nation's coal comes from my county. There are 92 train-loads of 150 cars a day that leave our county full of coal.

So I pay a lot of attention, of course, to what is happening in the way of taxes and tax credits. I do blame the oil and gas industry for a poor naming of their part of the tax code, because they call it intangible drilling costs, which sounds like it really did not happen. But it is real stuff. It is like that ream of paper that Dr. Kreutzer mentioned. It is also the pipe that goes down in the hole. It is also the cost of getting the lease to begin with, and all of the costs associated with that. We do not allow them to deduct any of that until they actually have some production. So it is not a deductibility of expenses, and it is even done over a longer period of time.

One of the things I always caution the committee on is, if we eliminate some of these things, first of all, we ought to be sure that it is not the same as somebody else is getting, just under a different name. I will use one example that we have talked about a little bit which I expect will never happen, and that is elimination of the individual's mortgage deduction.

If we were to eliminate that overnight—or many of these other things that we talk about—we would create a real cash flow problem in the United States. Yes, the government would do really well in the year that we did those.

So I keep talking about transition on any of these. We do have a little bit of a transition on the Production Tax Credit, because it extends for another 10 years. So that gives people a chance to adjust to it as it disappears. I have talked about transition enough that most of the members of the committee talk to me about transitioning——

The CHAIRMAN. People need to understand how exciting in the tax reform area it is to do the transition work. I mean this is really root canal kind of stuff. [Laughter.]

I just want to commend Senator Enzi for constantly, in all of our tax reform discussions, coming back to that point. It is fine to talk about how you are going to be somewhere in a few years, but if you do not do what Senator Enzi is talking about, which is describe how you are actually going to get there step by step, tax reform does not come together. So I appreciate my colleague talking about that.

Senator ENZI. I appreciate that, Mr. Chairman.

I do think that oil and gas development is important, just as important as any of the other energy sectors. One of the tax increases the administration wants is changing the deductibility of intangible drilling and development costs. Those are comparable, perhaps, to research and development, but I think they are more comparable to amortization and depreciation. So the loss of this deduction for producers would reduce their available capital immensely.

So, Senator Nickles, can you speak to why this deduction continues to be vitally important to the industry and how the elimination of the deduction would impact the economy?

Senator NICKLES. Thank you, Senator Enzi. The biggest economic boon to this country has been the explosion of oil and gas activity, primarily because of fracking. There has been big growth in drilling, and you see oil production going up, gas production going up, jobs, severance taxes, you name it. Those are real jobs. Some people do not make the connection that extending the subsidies for

wind actually works to the detriment of some of those jobs, but it does.

If Congress passed the administration's proposal on intangible drilling costs, you are telling the person who is drilling a well that he cannot expense the wages on that well. He has to amortize that over 5 years, a portion of it. That, to me, makes no sense. As an example, look at Harold Hamm, the biggest developer in the Bakken. He is spending more money than he makes back into that field. Why cause him to put a lot less money in that field? You are going to have a lot less production.

The administration's proposal would dramatically scale down the activity in the oil patch. Surely, this Congress is going to look at that and say, wait a minute. Uncle Sam is not writing a check to Harold Hamm to drill that well. Does he get to expense his costs in the year incurred? Yes. Is that Uncle Sam writing a check for it? No. Uncle Sam is writing a check to Warren Buffett to produce windmills—$138 million.

There is a big difference. Warren Buffet receives a subsidy. Harold Hamm is allowed to expense something. You can debate over how long it should be, but I think people should be able to deduct, at least, their wages in the year incurred.

Senator ENZI. Thank you, Senator. I did have a question on percentage depletion deduction that I was going to ask Dr. Kreutzer, but I will submit that in writing. I also have a number of questions on the Production Tax Credit, and wind and solar, and I will be submitting those questions too. If you would be so kind as to answer them for me, I would appreciate it. It will be helpful in our debate about tax fairness.

The CHAIRMAN. Thank you, Senator Enzi.

Senator Bennet?

Senator BENNET. Thanks, Mr. Chairman. Thanks for holding this hearing, and thank you to the witnesses for being here.

One of the things I would add to your list as we think about tax reform is the extent to which incumbent interests use the tax code to their benefit and to the detriment of innovators in the economy. We should be on the lookout for that everywhere in our statute books, especially in the context we were having a discussion about, which is winners and losers. I think we will have an interesting opportunity to debate that.

I guess I would start with Mr. Augustine, East High grad from Denver, CO. It is nice to see you. When you guys were looking at the R&D question, was there a conclusion about why it is such a small percentage of the overall energy economy that we spend on research and development?

Mr. AUGUSTINE. There really was not a great discussion of that in that particular group. Based on other conversations and studies, I think one factor is that, up until recently, the energy economy was moving along fairly smartly. We did not realize we had the kind of problems we have today. It was somewhat status quo.

I think also a factor is that the investments in the energy arena tend to be very long-lasting. The facilities that are built last a very long time. There is not the drive to constantly bring in new technology and update what you have.

I would cite as an example of the contrary, Intel Corporation. The CEO of Intel has told me that of the revenues that Intel receives on the last day of any fiscal year, 90 percent of them come from products that did not exist on the first day of that fiscal year. Whereas, if you are in the energy business—I was on the ConocoPhillips board for many years—your investments are very high and they last a very long time. So you do not have that drive.

Senator BENNET. Yes. Mr. Zindler, it has been our experience in Colorado—and, Senator, it is great to have you here—that we have had great growth in oil and gas jobs, and we have had great growth in wind jobs. I have not detected that the wind jobs are taking away the oil and gas jobs.

I wonder if you could talk a little bit more about the effect of the on-off switch that has happened with the wind PTC and the damage that would be done to the manufacturing base that relates to wind technology in this country if we do not figure out some way to stop sending the kind of signal that we have sent.

Mr. ZINDLER. Sure. Thanks very much. Well first, just to be clear on my comments regarding the drilling costs, I am only saying these are all subsidies and we should just be honest about it. I am not saying one is better. I leave that to all of you to make the value judgments on which ones you want to be supportive of, but they are all subsidies supporting these——

Senator BENNET. You are saying the mechanics of either the government writing a check to somebody or somebody writing a check to the government——

Mr. ZINDLER. Right. Which, by the way, the government does not write a check. They simply expect you to pay less taxes thanks to the tax credit.

Senator BENNET. Right.

Mr. ZINDLER. Anyway, that aside, both represent supports, and arguably, both are very important if you want to pursue what has been described as an all-of-the-above kind of policy strategy for U.S. energy. I think it is interesting that we have not seen what I would call any kind of crowding out—to the best of my knowledge—of the wind industry crowding out the natural gas industry.

The natural gas industry has been surging. I give full credit to George Mitchell and others whose incredible innovations have gone on and taken place over the years, as well as the new discoveries and the abilities to exploit them in the various shales around the U.S. It has really been an incredible thing, and it is helping American economic competitiveness.

In terms of the wind industry and the potential impact, there are approximately 10 gigawatts of potential capacity of manufacturing on U.S. soil. We are thinking that about 15 gigawatts are going to be built between this year and next.

So, if you simply were to drop that down very substantially in 2017, 2018, and beyond, yes, you end up with a situation where you might have a considerable amount of built manufacturing capacity that essentially goes idle, similarly to what happened a couple years ago, the last time the industry faced this.

Senator BENNET. Thank you. Professor Metcalf, one last question for you. In your testimony, you talked about the attractiveness of so-called technology-neutral tax credits. The chairman has talked

about that as perhaps the most realistic proposal to energy tax policy. I think I agree with that, but it is important for us to get the details right to ensure the policy works as well as existing credits. For example, Mr. Zindler was just talking about natural gas.

Some of us have thought about, well, would you have a standard of emissions as a way of making sure that natural gas was a beneficiary as part of this? I just wonder whether you could talk a little bit about the details of what would be a sensible neutral credit.

Dr. METCALF. Thank you. So it is an excellent question.

Senator BENNET. Finally. [Laughter.]

Dr. METCALF. So again, I think with all of these policies, we are trying to address market failures. And just a quick comment on your initial question about R&D: information is a pure public good, and we know that private markets under-provide information, so providing support for R&D is, I think, quite valuable and in that way quite important in the energy sector.

So what we really want to do is to get the relative price of fossil fuels and non-fossil fuels right, taking into account the social cost of greenhouse gas emissions. So you need a baseline. Now, whether the baseline is the current emissions per million BTUs of natural gas or whether it is, say 90 percent of that level, I think that is something that is an important question. I do not, quite frankly, know what the right number is. Part of it depends on where we think that we can incentivize technology in the short run for natural gas to improve their emissions, and it might be around capturing fugitive emissions or other kinds of things like that.

Once you have that baseline, then you do provide the right incentives, both for natural gas, as well as for wind and solar. It does give you the right signal, the price signal.

And just one last very quick point: we have been talking a lot about expensing of intangible drilling costs. I just want to point out that the cost to the tax system of percentage depletion is double that of intangible drilling costs. We should not forget that either.

Senator BENNET. I want to apologize for going over, Mr. Chairman. It is the first time ever, but thanks for the great panel.

The CHAIRMAN. No, not all. Thank you for the important point.

Senator Cardin?

Senator CARDIN. Mr. Chairman, first, thank you very much for holding this hearing. It is incredibly important that we update our tax incentives for the energy realities of today. So I thank you for doing this, and I thank you for your leadership.

I do want to point out that, in the legislation this committee has approved, we have already taken, I think, an important step on energy conservation with section 179D. I hope we will get that to the finish line. That allows not only the extension of 179D, but the improvements, with your help, that we put in here that deal with nonprofits being able to take advantage of the 179D credits. And we are working together to deal with pass-through entities and how we can make it work for them. I hope we also can get to existing structures using the 179D, because energy conservation is one of the easy areas that we should be able to deal with in an energy policy in this country.

I want to spend my time getting answers from the panel on dealing with an area that we have not really focused on, which is tax

incentives. We spent a lot of energy and time talking about how we generate electricity and what we can do to encourage the generation of electricity, but we have not talked about how we can make more efficient the transmission and storage of energy in this country.

There are a lot of new technologies focused on how we can do this in a much more efficient manner that could save energy, could save costs. I am interested in hearing from the panel their ideas on what we can do to encourage a more efficient system. Now, it can come from traditional sources, such as coal generating electricity or it could come from our renewable sources, such as solar or wind.

How do we tackle the issue of this country being more efficient in the way that we store and transmit energy in America? Who wants to tackle that first?

Yes, sir?

Dr. METCALF. That is a great question. I have done a fair amount of research thinking about our transmission grid in the United States, and some thinking as well about storage. They are different issues in my mind.

Storage is really an issue of research and development, coming up with technologies to store electricity at a cost-effective price. There is a lot of interesting work going on to do that. Of course, there is long-term storage. There is short-term storage for smoothing out fluctuations in energy. So I think continued R&D support is critical for making advances on the storage side. Of course, we have had storage going back a long time. Pump storage for hydroelectricity is a form of electricity storage, though it is less popular these days.

On transmission, I think that we do have a good provision in the tax code in terms of accelerated depreciation for transmission. Here I think some of the challenges may be more on a regulatory basis. We are looking to move electricity great distances from resource-rich areas where we can produce wind to population-rich areas where we want to consume it. Often this requires sending that electricity across State lines, and then you have federalism issues and who gets to write the rules on this. Is it the Federal government? I think some advances were made in recent years on that, but that——

Senator CARDIN. Mr. Zindler, do you want to jump in here? I know there are some concerns about the difficulty of storing and transmitting with solar, with wind. I know there are some regulatory issues. There is no question about that, but can the tax code be more efficient in helping us deal with this?

Mr. ZINDLER. It is an interesting question. Thinking about storage and balancing is something that, as you look to the long-term future and you see more of these variable sources of energy deployed, you certainly have to take into account.

As far as the tax code is concerned, it is a good question. I think one of the more interesting—it is actually a non-tax solution, but in California, they have begun to mandate that the utilities put a certain amount of power storage onto the grid. I think that is not necessarily a bad idea, given the kinds of new challenges that we are facing.

It is hard for utilities and others to justify some of these investments right now, but the need for storage that will be there 5 or 10 years down the road sort of calls out, in my view, for policymakers to think about putting in place policies that create the right kinds of incentives.

Senator CARDIN. Does anyone else wish to comment? I have 18 seconds left, so somebody could take it.

Dr. KREUTZER. I think the grid operators and utilities should be the ones that come up with the money for doing this, unless it is basic research on technology that does not exist. But if there is a cheap source of energy that is variable and intermittent, then they would get the benefit of coming up——

Senator CARDIN. I think that point is well-taken. The problem is, it is just not being done today. I hear more and more of the generators saying, well, we cannot deal with the storage and transmission, therefore, we are either wasting energy or we are not producing as much as we would otherwise produce.

Mr. Chairman, thank you very much.

The CHAIRMAN. Senator Cardin, thank you for bringing up storage, because, obviously, the sun does not always shine, and wind does not always blow. The Department of Energy actually—back when I was chair—put together a report that came in, essentially, at the end of last year, and we are supposed to see soon what they have done to actually implement it. So most of the action has been on the regulatory side, but I am glad you are raising it here, because clearly this ought to be part of the tax debate too.

All right. The birthday man of the hour, the recipient of the Dairy Queen gift certificate, has arrived. [Laughter.]

Senator GRASSLEY. Thank you. Mr. Chairman, you probably know that while Senator Nickles was in the Senate, we probably only disagreed on one thing.

The CHAIRMAN. I understand that. [Laughter.]

Senator GRASSLEY. So I never had an opportunity to ask him a question where he had to answer. [Laughter.]

I am not going to go into a lot of this stuff—I got here late—that I assume has already been asked dealing with oil and what some of us would say would be preferences for one energy, where we would like to ask you, why for those and not for others?But I would like to make this point and ask you, when it comes to understanding why eliminating one tax preference that you might support might be a job-killing tax hike, while eliminating another is ending a subsidy, do you believe that raising taxes on alternative energy and raising their cost of doing business will lead to job losses, and is there a difference, then, between a job loss in the oil and gas sector versus one lost in the renewable energy sector?

Senator NICKLES. Senator Grassley, it is a pleasure to see you and happy birthday to you, and just two or three very quick comments.

You and I served together for 24 years. You know I do not like subsidies, any subsidy. I happen to think there is a difference in allowing somebody to deduct an out-of-pocket expense. I do not consider that a subsidy. I do consider it a subsidy, a tax credit, if it is refundable, and someone is receiving a check. If not, they are reducing their taxes by a certain amount.

In energy—as some people in this room know—I led the effort to repeal the windfall profits tax. We finally did. I led the effort to decontrol natural gas. We finally did. I want the marketplace to work in energy, and it can. It has proven to be effective.

Credits distort the marketplace, particularly if the credits are enormous. In the case of wind—to give a tax credit of 2.3 cents per kilowatt hour compared to, let us say an average cost of 6 cents—you are talking about a subsidy that is about 40 percent of the wholesale price. That is enormous.

If it was going to be comparable to oil—big oil as you might say, Senator Grassley—that would be roughly $2 per Mcf. Those are enormous subsidies. When people talk about parity, I say, you cannot afford parity—you cannot afford to extend the subsidies that are in the Production Tax Credit to other forms of energy. It just is not doable.

There is one other comment I would just make. Senator Enzi is here. I noticed the CEO of Wyoming Power is building a multibillion-dollar wind farm in Wyoming, and he said he can do it without the tax credits. He says it is market-competitive. I hope it is.

The PTC has been on now for 22 years and is going to extend another 10. That is 32 years. That is long enough.

I do see an enormous difference between the PTC, which I do consider a subsidy, and intangible drilling costs. Another big subsidy for big oil—according to the administration—is section 199, the manufacturing rate. I know, Senator Grassley, you will remember that I argued against having a lower manufacturing rate—a lower corporate rate. When you all are rewriting this next year, I hope you eliminate this disparity between manufacturers and nonmanufacturers.

In the definition of manufacturers, you have movie production, you have Starbucks, you have a whole lot of people that—really, those are manufacturers? Oil production, I might say, and——

Senator GRASSLEY. Can I interrupt your filibuster, because——

Senator NICKLES. Sure. [Laughter.]

Senator GRASSLEY. My question was, is a job loss in one industry any different than a job loss in another? You make the point that, if we do away with these, there is going to be job loss in the petroleum industry, in the gas industry. What about job losses in the alternative energy industry if we end these?

Senator NICKLES. I would think that they would be made up by other industries. I think wind, particularly, is crowding out other sources. It is crowding out a coal plant in Wyoming that shut down. It may force nuclear power plants to be shut down prematurely. Those are jobs as well.

Natural gas is kind of the swing fuel. Right now it is the competitive fuel, because natural gas sells for about $4 per Mcf. So if the jobs are not being created in wind, I think they will be created or added—not deleted—in the other industries. I would think you would not see overall job loss. You may have some reduction in the wind sector, maybe not, because Wyoming says it can go on its own, but there might be some. My guess is it will be made up in other sources.

Energy needs to be produced. We have a hunger for energy. We need to provide it. Our economy depends on it.

Senator GRASSLEY. Mr. Chairman, you might wonder, with his being in the U.S. Senate, how I was able to get the Wind Energy Tax Credit passed. [Laughter.]

The CHAIRMAN. None of us underestimates your incredible legislative prowess.

Senator NICKLES. Not only were you the father of wind, but you were the father and sustainer of ethanol for many years. My compliments to your effectiveness. [Laughter.]

Senator GRASSLEY. Well, thank you. [Laughter.]

The CHAIRMAN. Thanks.

Senator GRASSLEY. You bet.

The CHAIRMAN. My colleagues are heading to the exit. I just want to ask one last question, again, in the interest of trying to go forward and not continue just the sparring that we have seen.

I am sure that you have already picked up that, with respect to tax reform, everything has to be on the table, because, if everybody walks in and says, look, I am for tax reform except for that one thing that is important to me or my constituents and is so incredibly wholesome, you are never going to be able to have tax reform, because you will have 100 Senators all doing that.

Senator Gregg, who was—and Senator Nickles remembers this—Leader McConnell's go-to person on economics, sat next to me every week on a sofa for 2 years to produce our tax reform bill, which is still the only bipartisan Federal income tax reform bill. You do not get everything you want. Then you come into a committee like this and say, everything is on the table, and that is how you proceed.

So in that regard, I want to just ask one last question about the technology-neutral approach, which you talked about, Dr. Metcalf, and maybe some others would like to as well. Let us say we take this crazy quilt of these 40-plus incentives and here—on this point, at least, we will not have a riot breakout. Some of them are fossil-related. Some of them are renewables-related. So we can, sort of, start from that point.

Let us say we decided to, in effect, make a change so that for the long-term, the few provisions that we would have would be based on performance, not fuel type. Now, from the seat of my pants—and I would want to talk with you all and others—it strikes me, for example, that natural gas would probably do pretty well with a standard like that. And again, this is just purely, kind of, seat of the pants.

But you started that with Senator Bennet. I have talked about it, and other Senators have talked about it. Is that, sort of, the kind of lodestar we ought to be talking about, seeing if we can move to a tech-neutral kind of approach, so that the focus is on performance and getting out of winners, losers, and all the rest? Some provisions now are for fossil fuels. Some now are for renewables. That is where we want to go. Is that the kind of thing you are talking about, and is that what we ought to be building around?

Dr. METCALF. Given that we are not in a world where we are going to be looking at carbon pricing, then I think this is the right approach to be taking. And you really said something very important, that it is performance-based. What we care about is not how

many generating plants we build, but how much clean electricity we get out of them or how much lower-emission electricity we get out of these plants. So that really speaks to the value of a production-based approach. Though I understand that there are, perhaps, liquidity reasons why investment approaches would be valuable as well.

So performance, I think, is important, and here I absolutely agree with Mr. Nickles that we do not want to be supporting mature industries. In that regard, I think the oil and gas industry is no longer an infant industry. I think percentage depletion is not related to the actual cost incurred, so I think we can make savings there.

This actually provides some of the revenue to pay for these things, because you have the tough job of actually having to finance these tax breaks in the system. So a performance-based system will incentivize cleaner use of natural gas, and it will incentivize other technologies, and it will incentivize technologies that we do not even know about yet that will come along, whether it is cellulosic ethanol or other technologies. By not linking it to particular fuel types, we open the door to inventors and researchers to come up with technologies that will fit into this technology-neutral approach.

The CHAIRMAN. Let us do this. You can tell that I am interested in this. I think this has the potential to be something that could be bipartisan. All of these capable people are toiling away on tax reform. If you or any of the panel members have further thoughts on this technology-neutral kind of approach, call all these good people nights and weekends and take their free time. [Laughter.]

This is extraordinarily important.

Senator Nickles, you are absolutely right with respect to the challenge of tax reform. When Senator Gregg retired, Senator Coats came in. Senator Coats had a number of areas that were important to him in the energy area, and you can see that I tried to address those as part of our reform bill going forward.

The old notion—I think I still ascribe this to Senator Bradley at the time—is that tax reform is always totally, completely, and thoroughly impossible until about 15 minutes before it comes together. That means that this debate is in the "to be continued" department.

We are going to keep the record open for all who would like to offer added submissions. With that, the Finance Committee is adjourned.

[Whereupon, at 12:03 p.m., the hearing was concluded.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

TESTIMONY
OF
NORMAN R. AUGUSTINE
BEFORE THE
COMMITTEE ON FINANCE
OF THE
UNITED STATES SENATE

SEPTEMBER 17, 2014
WASHINGTON, DC

Mr. Chairman and members of the Committee, thank you for this opportunity to share with you some thoughts on the challenge of providing safe, clean, affordable, sustainable and secure energy in sufficient amounts to power our nation in the years ahead, and especially the critical role of tax policy and federal and private research and development in achieving these goals.

My remarks today will be based upon the work of the American Energy Innovation Council, an independent and informal group of seven members who came together in 2010 because of our common concern over what we consider to be America's insufficient response to one of the greater challenges facing our nation today; namely, the provision of energy. In this capacity we represent no other group. We speak simply as seven citizens who, in the course of our careers, have been called upon to meet various challenges and make difficult decisions and would like to share that experience as it relates to meeting the energy challenge.

My associates in this endeavor are John Doerr, partner at Kleiner Perkins Caufield & Byers; Bill Gates, chairman and former CEO of Microsoft; Charles Holliday, chairman of Bank of America and former chairman and CEO of DuPont; Jeff Immelt, chairman and CEO of GE; and Tom Linebarger, chairman and CEO of Cummins, Inc. Tim Solso, former chairman and CEO of Cummins and Ursula Burns, chairman and CEO of Xerox, are founding emeritus members of AEIC. Technical and administrative support for our work has been provided by the Bipartisan Policy Center (of which I am on the Board of Directors). The Bipartisan Policy Center was founded by Senators Howard Baker, Tom Daschle, Bob Dole and George Mitchell as a non-profit organization seeking principled solutions to difficult public issues through analysis and respectful dialogue.

Your committee is well aware of the extent to which energy issues permeate the challenges faced by our nation. These include the impact on the economy of the often uncertain availability of energy supplies, energy price volatility, and total energy costs; the hazards of energy-related pollution on our nation's and planet's natural environment; and the role of constrained and manipulated energy supplies as a source of geopolitical friction and even armed conflict. Thus, while fully recognizing the many demands facing America today, the provision of safe, clean, affordable and sustainable energy is, by virtually any standard, one of the foremost challenges we face—particularly given how intertwined energy is with a host of strategic issues.

While my testimony today is drawn from the work of the American Energy Innovation Council–or AEIC–and while I am honored to have been invited by the Committee to appear before you—I have no special authority to speak for the group as a whole. I do, however, believe that my testimony represents the general views of my colleagues. AEIC considers that a combination of robust government and private sector research and development (R&D) investment related to energy AND thoughtful tax policy must work together to drive innovation and encourage private sector development and deployment of new technologies.

In the past few years, AEIC has issued two major reports and a series of case studies on the role of government research, development and government/industry/academia partnerships in driving innovation in energy. The first of these reports highlighted the need for a more vigorous public commitment to energy technology development. America's investment in energy

innovation from the public and private sectors together is less than one-half of one percent of the nation's energy bill. This fraction is eclipsed by the innovation investment in most other sectors, particularly in the high-tech arena. Meanwhile, we send one billion dollars abroad each day to pay our energy bill to foreign producers, not all of whom share our overall interests. AEIC has called for roughly tripling U.S. energy R&D spending as a key economic, national security, energy policy and environmental priority.

AEIC's second report addressed the bounded but important role the federal government must play in catalyzing American ingenuity as it seeks to meet the nation's energy demands of the future. While most of the current means of energy production are likely to be with us for a very long time, each suffers from one or more shortcomings, whether it be cost, pollution, safety, limited scalability, sustainability, or lack of domestic sources. If these liabilities are to be overcome, the nation will need to depend much more heavily on innovation. By that, we mean utilizing high quality research to create new knowledge; world-class engineering to convert that knowledge into new or upgraded energy sources and delivery means; and enlightened entrepreneurship to translate those sources and delivery means into the marketplace. Fortunately, America has excelled in all three of these activities in a variety of different fields. Taken together, these activities make up innovation—although it must be noted that we are now losing our lead in at least two of these attributes.

More recently, our group released a series of staff papers showing the critical role the government has played as a catalyst to private-sector innovation. We examined several significant advancements such as unconventional gas exploration and production; aeroderivative gas turbines; alternative vehicle technologies; advanced diesel internal combustion engines; and, low-emissivity windows, to see just how the government and private sector interacted.

The government contribution has generally taken the form of supporting research into fundamental phenomena and lowering the risks of applying new technologies. The latter has been accomplished with mechanisms such as seed-grants, loans, cost-sharing of demonstration projects; diffusion of technical knowledge, partnerships, and standardizing information to help markets work better. The former role has taken the form of creating new knowledge, an asset that represents an important public good but one for which market participants generally lack incentives to pursue. This includes basic and, to a lesser degree, applied research, and driving demand for private-sector technology innovation, such as through direct procurement or establishing performance standards.

In both of these areas of government involvement, the government and private sector complement each other. The private sector translates ideas into products and markets; thus, feedback from private partners is critical for productive public-sector activities. But without the investment of the government in the creation of knowledge, the private sector would lack what is in many cases its most important resource. Furthermore, our case studies show that the dividing line between private-sector and government efforts is often blurred. For example, public-private partnerships generally use cost-sharing, generating R&D efforts that neither party on its own would undertake. Similarly, government funding of R&D through national laboratories and universities invests many young scientists and engineers with skills that they subsequently take

to the private sector. In some cases, the government has been the primary or even sole customer of particular energy technologies, resulting in a collaborative effort with private-sector vendors.

In pursuing the creation and deployment of new or improved technologies, it is not uncommon to encounter what many innovators refer to as "The Valley of Death"—that period wherein an idea appears promising but has not yet been demonstrably shown to be workable in practice—and therefore is deemed too risky to warrant support by most private investors. To surmount the latter generally requires some form of convincing proof-of-principle demonstration, which in turn requires significant, sustained, and hard-to-come-by financial resources—often leading to underinvestment in potentially promising innovation.

There is also a second valley of death that occurs between proof-of-principle, say using a prototype, to verification of market utility and economic viability with a near commercial-scale demonstrator. This second valley of death, which also deters investors, is a consequence of the size characteristic that often accompanies energy projects, making it very expensive to remove uncertainties as to ultimate scalability of an otherwise promising development.

Further complicating energy innovation is the capital intensiveness of most forms of energy production, delivery and storage, a characteristic that makes the economic threshold for replacing old plants with new ones very high. In short, due to the risk, expense, and uncertainty entailed, private sector investment will often be unavailable to bridge these valleys—which is why there is a critical role for publically funded support, particularly for basic energy research and developmental scaling. In both of these regards it is important that government efforts focus on approaches that offer the potential of quantum gains, even if accompanied by substantial risk of failure, since it is in this arena that the private sector, responding to the demands of the financial markets is unlikely to invest. Government should not devote its limited resources to seeking marginal gains, even if they are high confidence.

Each of these challenges can be addressed through a combination of robust government investment in basic scientific breakthroughs related to energy AND thoughtful tax policy. Working together, these pursuits can drive innovation and encourage private sector development and deployment of new technologies.

AEIC strongly supports robust, public investment in energy technology and innovation through such avenues as the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) and Energy Efficiency and Renewable Energy (EERE) programs. Similarly, we have supported the America INNOVATES Act that calls for better coordination among innovation activities at DOE and gives the National Labs needed flexibility for partnerships with businesses and universities while reducing administrative burdens. We have supported the aims of the 2007 America COMPETES legislation and strongly call for its reauthorization to include continuation and expansion of ARPA-E.

Regarding tax policies to spur clean energy innovation, technology development and deployment, AEIC supports a number of basic characteristics well known to the members of this committee. We believe that energy tax policies should:

1. Encourage development and deployment of domestic, clean, low emission sources of energy;
2. Strive to be technology- and energy source- neutral; and
3. Be predictable, not subject to year-to-year renewals, but also not permanent.

Under a technology- and source-neutral approach, existing source-specific tax incentives could be phased out over time in order to allow a predictable transition for investors and an optimal investment strategy for the nation. In this regard, former Chairman Baucus and current Chairman Wyden have both stressed the necessity of encouraging sustainable domestic, low emissions energy sources even as existing incentives are reformed. Phasing out existing source-specific energy subsidies and incentives will unencumber revenue, a portion of which we believe should be devoted to increasing U.S. energy R&D investments.

We recognize that large scale energy tax reform is most likely to occur in the context of broad-based, overall tax reform, which like almost all business leaders, and indeed most Americans, we strongly encourage. We only reiterate that such tax reform should provide clear incentives for energy research and innovation, as energy remains a critical driver of US economic growth and job creation.

Regarding the R&D tax credit, we would comment only that encouraging the private sector to invest in energy development is critical, and therefore that some predictable form of R&D tax credit for energy should continue.

Again, we believe it is the interplay between basic R&D investments and technology-neutral tax incentives that is most likely to lead to a bright future of US technology development and deployment.

As one who has long been involved in national security policy, including having served as CEO of Lockheed Martin and as Under Secretary of the Army, I would stress the security advantages of developing domestic sources of energy, especially those that transition away from dependence on foreign oil.

Although I must confess that I, and I believe my colleagues, are strong devotees of free enterprise are opposed to government intervention in markets to the extent practicable, the energy dilemma seems to be exactly the sort of issue which governments are designed to help solve, at least in democracies with free markets. That is, this is a case wherein there is an important public benefit to be had by the citizenry as a whole, but for which private entities cannot, or will not, provide all the needed investment because of financial risk, extensive delays in receiving returns, small or even negative returns and the possibility that the returns will not even accrue to the investor or performer. The latter is particularly true of the pursuit of basic research.

This circumstance is one that has long been recognized by our government in a number of areas, including many involving the application of technology. Commercial nuclear power was the result of government investments in Naval reactors; commercial jet aircraft trace their origin to military transports; GPS to military positioning systems; the internet to packet-switched

networks demonstrated by ARPA; and communication and weather satellites to military space programs. These achievements were in some cases by-products of the government's pursing other missions in the interest of its citizens—but the provision of energy is itself a mission of the utmost importance to the citizenry.

Principal objections to greater government participation in, and particularly the funding of, such activities are that: government involvement may unfairly favor one private entity over another; the government should not be in the business of "picking winners and losers"; foreign firms, not U.S. firms, may prove to be the ultimate beneficiary of the U.S. taxpayers' investments; and there are other important demands for the application of the government's finite financial resources.

In fact, the government's work in the early research phase can be, and generally is, made available to all interested parties. Consider NASA's aeronautics research and its impact on making commercial jet airliners a reality or the role of SEMATECH in the microelectronics industry. With regard to picking "winners and losers," the government in effect does this every day at places like DARPA, ARPA-E, NSF and NIH. The key to success under this circumstance is to maintain an open competition for ideas, transparency of results, and recent competent individuals to government service who can weigh the options that are available—having carefully considered the private sector's perspective along with all other relevant perspectives. In the case of funding large demonstrations, the solution once again resides in maintaining fair and open competition. With respect to foreign firms occasionally being the principal beneficiaries, this is simply a fact of life in the globalized marketplace permeated with instant communications. The way to prosper is not to seek to hide information but rather to be quicker to the market with a better overall product that one's competitors. Finally, with regard to the other funding demands faced by the government, few issues have greater potential positive or potential negative impact on our nation than the availability of clean, sustainable, safe and affordable energy.

It goes without saying that the members of the AEIC are aware of the intense fiscal problems facing the nation—and you as its leaders. But we are also aware from our own businesses that during difficult times it may be necessary and appropriate to *increase* spending in some areas while at the same time making overall reductions. There is an important distinction to be made between spending for investment and spending for consumption. Whatever the case, it is important to recognize that not all investments in innovation will "pay off"...some, perhaps most, will fail. This is simply a fact of life. Supporting innovation is neither a short-term strategy nor a pursuit for the uncommitted. This is why a "portfolio" approach is generally a sound approach to such investment.

Finally, it would be inappropriate for me to miss this opportunity to address briefly the precarious position in which America's overall innovation engine finds itself today, not just as it concerns energy needs but as it affects virtually all national issues. Our graduate schools of engineering now train mostly foreign engineers who increasingly say they will be returning home—often with the encouragement of our immigration policies; our public primary and secondary schools, on average, trail far behind those of most of the developed world; our great public research universities are challenged as never before by steep reductions in their funding;

the consumer market is moving to the developing nations; our national debt is so immense that it makes investment in the future particularly challenging; our stated corporate tax rates are now the highest in the world; our patent system is antiquated, as are our export controls; and U.S. corporations spend over twice as much on litigation as on research. This is not a formula for sustaining the success we have enjoyed in the past.

Fortunately, America still has a great deal remaining on the asset side of its balance sheet, foremost among which is our freedom and our free enterprise system. It includes our high-quality, albeit endangered, research universities; a culture of innovation and prudent risk taking; the rule of law; the sanctity of contracts; and so much more. But today's trends are not in our favor, and when one considers the rapidity of advancement in technology it is apparent that a nation can lose its position in a technology driven, innovative economy very quickly. We now rank number ten in the world in investment in R&D as a fraction of GDP. In terms of technological focus, we rank 79th among 93 nations in the fraction of Baccalaureate degrees that are awarded in the field of engineering—most closely resembling Mozambique in this regard. These developments have consequences that span from national security to health care and from our standard of living to the preservation of our planet's environment. The energy challenge we face today is, in my judgment, merely a reflection of this much broader challenge.

Thank you for the opportunity to share these candid thoughts with you, and, speaking as one of a group of private citizens, thank you for the attention you are devoting to this critical issue.

Questions for the Record
Senate Finance Committee
"Reforming America's Outdated Energy Tax Code"
Hearing Date: September 17, 2014
Questions for Mr. Norm Augustine

Question from Senator Orrin Hatch

1. *This question is for the whole panel, starting with Senator Nickles and Doctor Kreutzer. There have been several energy tax provisions that many consider government spending through the tax code. These provisions have taken the form of grants or refundable tax credits.*

   I am curious if any of the witnesses believe that the tax code is an appropriate place for government outlays and if we should include any energy tax provisions that result in outlays in tax reform?

   Answer: The American Energy Innovation Council supports tax policies that spur clean energy innovation, technology development and deployment through a number of basic characteristics well known to the members of this committee. We believe that energy tax policies should:

   1. Encourage development and deployment of domestic, clean, low emission sources of energy;
   2. Strive to be technology- and energy source-neutral; and
   3. Be predictable, not subject to year-to-year renewals, but also not permanent.

   Under a technology- and source-neutral approach, existing source-specific tax incentives could be phased out over time in order to allow a predictable transition for investors and an optimal investment strategy for the nation. In this regard, former Chairman Baucus and current Chairman Wyden have both stressed the necessity of encouraging sustainable domestic, low-emissions energy sources even as existing incentives are reformed. Phasing out existing source-specific energy subsidies and incentives will unencumber revenue, a portion of which we believe should be devoted to increasing U.S. energy R&D investments.

   Like many business leaders and most Americans, we recognize and encourage large scale energy tax reform to occur in the context of broad-based, overall tax reform. We only reiterate that such tax reform should provide clear incentives for energy research and innovation, as energy remains a critical driver of US economic growth and job creation.

   The United States faces economic, security, and environmental challenges associated with its energy system. To better address these challenges, energy tax reform should be concerned with providing predictability for long-term investments, promoting energy

market competition, incentivizing technology innovation, and improving policy cost-effectiveness. In following these principles, the tax code will support the private sector in making investments that ultimately lower the cost of energy, increase the diversity of our energy supply, increase international competitiveness, and mitigate threats to our security and environment.

The question is not whether or not to include outlays in energy tax reform, but what policies will most effectively meet the aforementioned goals. Federal appropriations for energy technology R&D address the aforementioned goals by increasing investment in and productivity of scientific research, R&D, pre-commercial demonstration projects, and pilot commercial projects. They create new economic possibilities and thereby widen the option space for business decisions and public policy.

Tax provisions complement federal appropriations by providing a demand signal for new energy technology development and deployment, resulting in learning-by-doing and economies of scale that lower the costs of new energy sources. Given the magnitude of the challenges facing the country, we should consider how a reformed tax code might best complement appropriations to drive successful energy innovation—and we should do so in light of the aforementioned principles of providing predictability for long-term investments, promoting energy market competition, incentivizing technology innovation, and improving policy cost-effectiveness .

Outlays may make tax provisions more accessible. For example, small businesses often cannot take advantage of the research and experimentation tax credit, as they lack sufficient tax liability. Making the research and experimentation tax credit partially refundable would enable small businesses to access the credit, spurring greater innovation investments and business formation.

Additionally, outlays may make tax provisions more cost-effective. Refundable tax credits could be a more efficient means to incent energy sector activities than non-refundable tax credits. For example, project developers generally enter into costly tax equity investment transactions to monetize the renewable electricity production tax credit. The transaction costs and higher capital costs associated in monetizing the tax credit reduce its effective value substantially and diminishes its cost-effectiveness. A refundable production tax credit at much lower level than a non-refundable tax credit could still achieve the same effective value, since companies could avoid tax equity transaction costs and achieve lower costs of capital by levering the direct outlays. As a result, refundable tax credits could provide the same incentive at a far lower adverse impact on government ledgers than non-refundable tax credits.

Ultimately, outlays through the tax code are not subject to the same oversight as outlays from appropriations, and they warrant greater controls, such as an automatic sunset or other limitation on the total outlay. Moreover, outlays are best considered in the context of a regular budgeting process.

Questions from Senator Mark Warner

1. *In your testimony you talked a bit about the need to have a commitment to innovation and R&D when it comes to meeting the future energy demands for our nation. Outside of improvements in innovation, what additional changes in the tax code could be made to help address the shortcomings that exist in in the various energy producing sectors we have?*

   Answer: We can provide technology-neutral incentives for clean energy. For international competitiveness and for environmental and health reasons, such as addressing climate change, the United States must lead in the development of clean energy technology. Whether renewable sources like wind and solar, carbon capture associated with coal and gas, or advanced nuclear reactors, we must invest in the technologies that will ensure the longevity of our energy system and become increasingly popular worldwide.

   Yet energy is not valued in and of itself, but rather for the goods and services it provides. This means that product differentiation does not drive innovation in energy supply options in the same way that it would for other types of products and services; therefore, there is not a market for the benefits of clean energy. Tax expenditures to support clean energy provide an effective price signal, which influences the decision-making of energy sector companies.

2. *You also mentioned your thoughts on private sector engagement-and that they might be hesitant to get involved on the innovation end because of the costs and uncertainty associated with it. What are some possible suggestions that might incentivize their involvement?*

   Answer: The private sector has tended to systematically under-invest in energy research, development, and demonstration (RD&D) relative to the potential gains to the economy—even where a market for the desired technology exists—because it is difficult for any individual firm to monetize all the benefits of these types of investments. The person or firm that generates new knowledge through RD&D is not the only person or firm that can use it in their work. Thus, new knowledge can "spill over" to others, which can reduce costs, create new products, and develop further innovations. In this way, knowledge spillovers generate economy-wide benefits greater than any single private valuation—which is why they drive economic growth. This spillover feature of RD&D is also one of the reasons why companies systematically under-invest in it.

   Because a company cannot capture the full value of the new knowledge they create, companies and industries will invest less in RD&D than would maximize overall economic growth.

   The energy sector in particular has suffered from under-investment in RD&D activities for several specific reasons:

   - Energy is not valued in and of itself, but rather for the goods and services it provides. This means that product differentiation does not drive innovation in energy supply options in the same way that it would for other types of products and services.

- Many energy technologies are capital-intensive and long-lived, with the result that many require significant up-front cash with a slow return. Slow turnover of capital assets combined with the need for large up-front investments mean that the sector as a whole is subject to a high degree of inertia, a tendency to avoid risk, and domination by incumbent firms.
- Energy markets are not perfectly competitive, due to regulatory uncertainty, market fragmentation, and distortions introduced by past policies—all of which generally slow the adoption of innovative technology.

Direct federal appropriations for energy RD&D provide one incentive for sustaining private investment in energy RD&D. We see time and again that sustained federal energy RD&D investments—such as in unconventional gas, aeroderivative turbines, and other technologies—promote private investments in those same areas and ultimately produce an economy-wide return. The tax code can complement these efforts by mitigating the aforementioned systemic barriers to private sector investment in energy innovation.

Investments through the tax code, such as the research and experimentation tax credit, assist the private sector insofar as they provide a monetary benefit to RD&D investments that are otherwise difficult or impossible for a firm to monetize. We believe that reforming the research and experimentation tax credit and making it a permanent provision would incent more private sector energy innovation investment.

Broader policy signals can offer businesses the confidence to make long-term innovation investment decisions. Putting a value on clean energy over an extensive period, for example, will lead businesses to invest in clean energy technologies to realize that value. Tax expenditures for clean energy do this by providing a price signal to energy market participants. Additionally, over the long-term, a fee on CO2 emissions should be considered.

3. *If you support an "all of the above" approach to energy policy, as I do, you want to ensure all of the eggs in our energy basket have an opportunity to grow. Whether it's a continuation of the benefits on hybrid and electric vehicles, a continuation of the Solar ITC (investment tax credit), or putting back into place modified residential energy retrofits (as I recommended with 25(c) in the EXPIRE Act). But I also know that getting to comprehensive tax reform will require give and take on both sides. My question is can you do all of this and reduce the overall tax rate? Where would the money come from?*

Answer: I do support an all-of-the-above approach to our energy future. The reason I support an all-of-the-above approach is because it is a means to addressing economic, security, and environmental challenges, not an end in itself. Diversification of energy sources and continued effort to innovate in all domains is critical to ensuring affordable, reliable, and clean energy.

We can ensure that all of the "eggs" in our energy "basket" have an opportunity to grow if we incent investments that drive energy technology maturation and eliminate the provisions that support already-mature energy technologies. One method is by ensuring that tax incentives phase out over time with the maturation of energy technologies, based on a predictable schedule, a set of market indicators, or some other automatic sunset mechanism.

If lowering the overall tax rate and broadening the base of taxable activities requires immediate reductions in existing tax expenditures, then invariably some consolidation of existing tax incentives or reductions in expenditures will be necessary. If phase-out is not possible, another option is to make a clear performance metric for what we wish new energy technologies to do—for example, provide power at some standard of cleanliness—and tie tax incentives to that standard in a technology-neutral way. Doing so can consolidate many provisions while still enabling growth across a wide array of our energy sources. While we support an all-of-the- above approach to meet our larger energy policy goals, that does not mean an all-of-the-above tax code.

Additionally, over the long-term, a fee on CO2 emissions should be considered. Although previous Congressional attempts to price CO2 and other greenhouse gas emissions failed to gain widespread support and are unlikely to gain political traction in the near-term, there are a number of ways to structure a fee for CO2 emissions that could generate significant federal revenue in the future, including for tax provisions that promote energy innovation.

4. *In addition to providing certainty, it's also important to look at how we measure volatility with this. We certainty want to incentivize certainty and price signals will motivate those in industry. How can using the tax code to do an all of the above approach to energy policy, reduce price volatility?*

Answer: Energy price volatility is primarily a concern for oil and gas. For oil in particular, commodity prices are determined on a global market and are thus subject to global dynamics. If demand for a fuel is inelastic, then changes at the margin in supply can have large price impacts. To the extent that the tax code can incent the diversification of our energy supply and increase the availability of substitutes for oil—such as biofuels and electric- or gas-powered vehicles—and for gas—such as renewable electricity and advanced nuclear power—that availability of substitutes will increase the elasticity of demand and attenuate the impact of price volatility on consumers. If the tax code can incent innovation investments that reduce the price of substitute technologies, then it can contribute to reducing the impact of price volatility for energy commodities while still promoting an all-of-the-above approach.

Senate Committee on Finance
U.S. Senator Orrin Hatch (R-UT), Ranking Member
http://finance.senate.gov

Hatch Statement at Finance Hearing on Energy Taxation

WASHINGTON – U.S. Senator Orrin Hatch (R-Utah), Ranking Member of the Senate Finance Committee, today delivered the following opening statement at a committee hearing on energy taxation:

Thank you, Mr. Chairman, for holding today's hearing. Discussions about our nation's energy policy are always timely.

It has always been my position that, when it comes to energy policy, we need an all-of-the-above approach. Indeed, there's no such thing as too much energy. We need to encourage energy production across the board and we need to do so in an efficient, cost-effective manner.

Sadly, this is not the approach we've seen under the current administration.

President Obama claims that he supports an all-of-the-above approach to energy policy. However, the truth is that the Obama Administration's real energy policy boils down to a belief that that fossil fuels are bad, and that the federal government should enact policies to punish the production and use of fossil fuels.

Just ask the coal miners and consumers of electricity negatively affected by the Obama Administration's war on coal.

And just look at the administration's Fiscal Year 2010 Treasury Greenbook. Regarding the administration's proposal to repeal the provision in our tax code for intangible drilling costs, it states: "To the extent expensing encourages overproduction of oil and gas, it is detrimental to long-term energy security and is also inconsistent with the administration's policy of reducing carbon emissions and encouraging the use of renewable energy sources through a cap-and-trade program."

This approach, in my view, represents a backwards view of our nation's energy policy.

Instead of discouraging the domestic production of oil and gas, we should welcome the recent production increases that we've seen. Increases in the domestic production of oil and gas

reduce our dependence on foreign oil and create many high-paying jobs. That being the case, the energy boom in places like the Bakken Shale region, as well as the Uintah Basin in Utah, is something to be supported, not punished.

President Obama's first misguided effort to transform our energy policy came in the form of cap-and-trade.

In 2008, talking about his cap and trade plan and in a refreshing moment of candor, Candidate Obama stated: "Under my plan of a cap-and-trade system, electricity prices would necessarily skyrocket."

After the 2008 elections, Speaker Pelosi rammed President Obama's wrongheaded cap-and-trade proposal through the House, and nothing further was done with it.

Proponents of a cap-and-trade approach have, for the most part, acknowledged that this proposal is dead. However, instead of admitting failure and moving on, they are repackaging cap-and-trade by calling it a carbon tax.

I'm no marketing expert, but if you couldn't sell the American people on a bad idea, adding the word tax to it is not going to make it look any more appealing.

Raising the price of electricity, natural gas, and gasoline does not sound like a good idea to most hard-working, middle-class Americans. Yet, that's precisely what a carbon tax would do.

My view on this is simple: If you really want to pursue a policy that ships jobs overseas, enact a carbon tax. If we purposefully enact policies to make energy – something every business needs – more expensive, American businesses and jobs will go to China, India, and elsewhere.

It's just that simple.

Cap-and-trade and the carbon tax aren't the only bad ideas out there.

In addition, over the last few years, we've seen the administration's continued refusal to approve no-brainer energy projects like the Keystone Pipeline. Our entire pipeline infrastructure needs to be updated and enhanced, yet the Obama Administration continues to sit on its hands.

And, in December 2014, then-Chairman Baucus put forward an energy tax proposal that he claimed was technology neutral. However, by picking carbon emissions as the standard for judging whether a technology would get federal dollars or not, the proposal is biased against fossil fuels such as coal, oil, and gas.

Now, as we all know, many of our nation's energy tax issues are addressed in the tax extenders package, which is one of the many reasons why it is so important that Congress act as soon as possible to pass that legislation.

We did our work on the extenders package here in the committee. I won't go into the particulars of what happened on the floor with that bill – if I did, we'd likely be here all day. Instead, I'll just say that we need to set partisanship and political gamesmanship aside and get the extenders package across the finish line as soon as possible.

Ultimately, when we turn to tax reform, hopefully soon, I believe we need to examine all existing tax provisions – including energy tax provisions – under President Reagan's three criteria for tax reform: fairness, simplicity, and efficiency.

Looking at the witnesses, it is clear that we have a good representation of different viewpoints about the various energy sources addressed throughout the tax code. My hope is that this hearing will contribute to our tax reform efforts.

Thank you, once again, Mr. Chairman, for holding this important hearing, and I look forward to hearing from the panel today.

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CONGRESSIONAL TESTIMONY

The Impacts of Carbon Taxes on the U.S. Economy

Testimony before
Committee on Finance
United States Senate

Wednesday, September 16, 2014

David W. Kreutzer, PhD
Research Fellow in Energy Economics and Climate Change
The Heritage Foundation

My name is David Kreutzer. I am Research Fellow in Energy Economics and Climate Change at The Heritage Foundation. The views I express in this testimony are my own, and should not be construed as representing any official position of The Heritage Foundation.

Carbon Taxes, Energy Costs, and Economic Activity

Hydrocarbon fuels provide 85 percent of energy in the U.S. So, a tax on carbon dioxide will drive up energy costs. These higher energy costs work their way through the economy raising costs of production, reducing income, and reducing employment. Analyses by both The Heritage Foundation and the Energy Information Administration (EIA) project impacts of carbon taxes that show employment losses exceeding 1,000,000 jobs and income losses (gross domestic product) exceeding a trillion dollars by 2030.

Taxes have two general categories of costs. The first is the tax revenue, called the direct burden in economic jargon. The second is the cost imposed by the tax's price distortions, called the excess burden. A simple (if extreme) example will illustrate these different impacts.

Suppose there is a $3,000,000 per gallon tax imposed on dairy products and with this tax in place a single gallon of ice cream is purchased each year. The tax revenue (direct burden) is $3,000,000. The excess burden is the value lost by destroying the dairy industry—farmers, processors, and vendors, etc.—minus any gains by those who produce and sell whatever substitutes replace a portion of the lost dairy products. In addition the excess burden would include the lost value to consumers who give up ice cream, milk, and cheese, etc., for less appealing alternatives.

The economic impacts outlined above (and discussed further below) include only the excess burden. At least in the Heritage analysis, the tax revenue is rebated immediately and directly to taxpayers. What remains is the damage done to the economy.

Boxer–Sanders Carbon Tax

In 2013 Senators Barbara Boxer (D–CA) and Bernie Sanders (I–VT) proposed a carbon tax in their Climate Security Act of 2013.[1] The tax started at $20 per metric ton and would rise by 5.6 percent per year, reaching $50 per metric ton by 2030 (the endpoint for the Heritage analysis).

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[1]Climate Protection Act of 2013, http://www.sanders.senate.gov/imo/media/doc/0121413-ClimateProtectionAct.pdf (accessed September 10, 2014).

Using the Heritage Energy Model (HEM), a derivative of the Energy Information Administration's National Energy Modeling System (NEMS), Heritage projected what the economic impacts would have been had the bill become law.[2]

The impacts would have included (dollar values are adjusted for inflation):

- Gross domestic product (GDP) loss of $146 billion in 2030;
- Income loss of more than $1,000 of income per year for a family of four;
- Over 400,000 lost jobs by 2016;
- Drop in coal production by 60 percent and drop in coal employment by more than 40 percent by 2030;
- Rise in gasoline prices of $0.20 by 2016 and $0.30 before 2030; and
- Rise in electricity prices of 20 percent by 2017 and by more than 30 percent by 2030.

Though renewable energy grew compared to baseline levels, it was not enough to make up for the lost hydrocarbon energy. In addition it is certain that businesses and households economized on energy use both by doing without and by employing more energy-efficient technologies. These responses would stimulate employment in certain sectors, but the net effect is an overall loss in employment. The projected employment loss for 2016 was 400,000 jobs. Of course, the energy-dependent sectors would suffer relatively larger job losses. Chart 1 from the Heritage analysis shows job losses as a percent of baseline employment.

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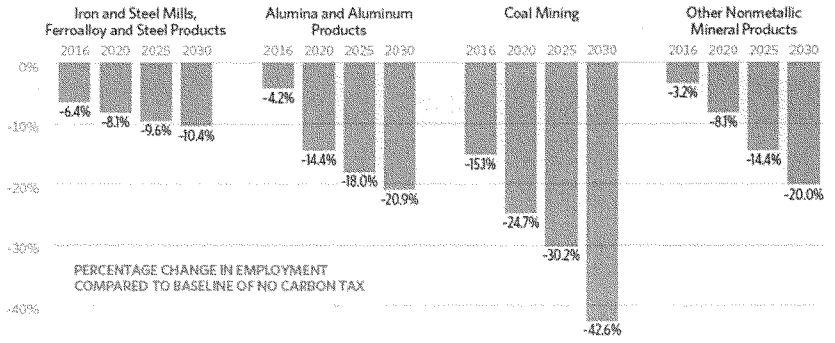
[2]David W. Kreutzer and Kevin Dayaratna, "Boxer–Sanders Carbon Tax: Economic Impact," Heritage Foundation *Issue Brief* No. 3905, April 11, 2013, http://www.heritage.org/research/reports/2013/04/boxer-sanders-carbon-tax-economic-impact.

CHART 1

Boxer-Sanders Effect on Employment in Select Industries



Source: Heritage Foundation calculations using the Heritage Energy Model. See Methodology for details. IB 3905 heritage.org

EIA Estimates of Carbon-Tax Impacts

In early 2013, a Heritage paper looked at the economic impacts of a carbon tax that was included as a side case in the EIA Annual Energy Outlook 2012.[3] That analysis noted the following impacts of a $25 per ton tax on carbon dioxide (CO_2):

- Cut the income of a family of four by $1,900 per year in 2016 and led to average losses of $1,400 per year through 2035;
- Raise the family-of-four energy bill by more than $500 per year (not including th cost of gasoline);
- Cause gasoline prices to increase by up to $0.50 gallon, or by 10 percent on an average gallon price; and
- Lead to an aggregate loss of more than 1 million jobs by 2016 alone.

Again, it should be noted that the NEMS and the HEM both include the changes in behavior and investment in energy-saving technology that firms and households will undertake to adjust to higher prices. So, the projected income and job losses are over and above any offsetting gains found in industries and services that provide low-carbon and no-carbon alternatives.

The Annual Energy Outlook 2014 (the most current edition) also has a $25 per ton carbon-tax side case.[4] Again the GDP losses are significant, exceeding $150 billion for

[3]David W. Kreutzer and Nicolas Loris, "Carbon Tax Would Raise Unemployment, Not Swap Revenue," Heritage Foundation *Issue Brief* No. 3819, January 8, 2013, http://www.heritage.org/research/reports/2013/01/carbon-tax-would-raise-unemployment-not-revenue.
[4]U.S. Energy Information Administration, *Annual Energy Outlook 2014* Table Browser, "Reference" and "Greenhouse gas $25" cases, Macroeconomic Indicators,

many years, and the jobs losses are severe, with employment in some years falling below the no-carbon-tax reference case by more than one million jobs.

So, carbon taxes will drive up energy costs, reduce employment, and cut income.

Impact on Climate

Some would argue that the CO_2 reductions create benefits from reduced global warming and the value of these benefits more than offsets the cost of a million lost jobs and trillions of dollars of lost income. There are several ways of looking at these suggested benefits.

Temperature Impact

Estimates of a carbon tax's impact on world temperature do not lend much support for a carbon tax. Climatologists Pat Michaels and Chip Knappenberger provide an online calculator to estimate the impact of various cuts in CO_2 emissions.[5] The calculations are based on the MAGICC model developed at the National Center for Atmospheric Research.

The AEO2014 side case for the $25 per ton carbon tax would cut energy-related CO_2 emissions by about 50 percent by 2050 (overall emissions would probably drop by a slightly smaller percentage). These cuts translate to a temperature moderation of about 0.05 degree centigrade (about 0.09 degree Fahrenheit) by the end of this century. Few would argue that this virtually unmeasurable impact is worth the million lost jobs and trillions of dollars of lost income.

Even eliminating carbon-dioxide emissions entirely and assuming the highest sensitivity of world temperature to carbon-dioxide levels (which happens to be the sensitivity that is furthest from that in recent research) would project a temperature moderation of less than 0.2 degree centigrade.[6] Of course, eliminating CO_2 emissions entirely, if possible, would have much higher costs to the economy than even those of the $25 carbon tax modeled by the EIA or the Boxer–Sanders tax modeled by Heritage.

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http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2014&subject=5-AEO2014&table=18-AEO2014&region=0-0&cases=co2fee25-d011614a,ref2014-d102413a (accessed September 11, 2014).

[5]Patrick J. Michaels and Paul C. "Chip" Knappenberger, "*Current Wisdom*: We Calculate, You Decide: A Handy-Dandy Carbon Tax Temperature-Savings Calculator," Cato Institute, July 23, 2013, http://www.cato.org/blog/current-wisdom-we-calculate-you-decide-handy-dandy-carbon-tax-temperature-savings-calculator (accessed September 11, 2014).

[6]For examples of recent estimates of climate sensitivity see Nicholas Lewis, "An Objective Bayesian Improved Approach for Applying Optimal Fingerprint Techniques to Estimate Climate Sensitivity," *Journal of Climate*, Vol. 26, No. 19 (October 2013), pp. 7414–7429; Alexander Otto et al., "Energy Budget Constraints on Climate Response," *Nature Geoscience*, Vol. 6, No. 6 (June 2013), pp. 415–416; and Magne Aldrin et al., "Bayesian Estimation of Climate Sensitivity Based on a Simple Climate Model Fitted to Observations of Hemispheric Temperatures and Global Ocean Heat Content," *Environmetrics*, Vol. 23, No. 3 (May 2012), pp. 253–271.

The Social Cost of Carbon

The social cost of carbon (SCC) is, in theory, a measure of the damage done to future economies from the emission of another ton of CO_2 for the year in which the CO_2 is emitted. In concept, the CO_2 emitted adds a warming effect to the atmosphere for the year in which it was emitted as well as subsequent years (to varying degrees) for centuries to come. The added warming in each year will have economic impacts from the warming and from sea-level rise. The present value of these damages is summed to get the SCC for the year of emission.

An interagency working group (IWG) produced a technical support document (TSD) in 2013 setting out a schedule of SCC values by year and by the discount rate used in the present-value calculations. The IWG used three integrated assessment models (IAMs) to estimate the SCC values for each year. Though interesting theoretical exercises, the information needed to flesh out the IAMs does not exist. As a result arbitrary values are inserted to paper over the missing critical information generating useless output from technically sophisticated models. Others have noted these fatal problems with the IAMs.[7] In addition, the IWG ignored guidance from the Office of Management and Budget (OMB) regarding appropriate discount rates and did not use the most up-to-date equilibrium climate sensitivity distributions.

Heritage analyzed two of the three models used by the IWG—the DICE model and the FUND model. The proprietor of the third model, PAGE, insists on the right of co-authorship for any publication using his model. Because this insistence seriously compromises the independence of evaluating the model, Heritage did not do so. This also raises a question as to the propriety of basing costly federal regulation, at least in part, on a model that cannot be rigorously and independently evaluated.

When Heritage evaluated the FUND and DICE models it was clear that the resulting SCC estimates were very sensitive to the choice of discount rates and equilibrium climate sensitivity.

Equilibrium Climate Sensitivity

Although global-warming activists consistently claim that the science on global warming is settled, anyone who has any familiarity with the scientific process would understand that research is a constant, ongoing process. For instance, one critical component of unsettled science is how much warming will be generated by a given increase in atmospheric CO_2 levels. This important (possibly all-important) relationship is called the

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[7]For instance, Robert Pindyck says that "IAM-based analyses of climate policy create a perception of knowledge and precision, but that perception is illusory and misleading." Robert Pindyck, "Climate Change Policy: What Do the Models Tell Us?" *Journal of Economic Literature*, September 2013, pp. 860–872. Also see Anne Smith et al., "A Review of the Damage Functions Used in Estimating the Social Cost of Carbon," American Petroleum Institute, February 20, 2014, http://www.afpm.org/WorkArea/DownloadAsset.aspx?id=4111 (accessed September 11, 2014).

Equilibrium Climate Sensitivity (ECS). The ECS typically gives an expected warming in degrees centigrade for a doubling of atmospheric CO_2 levels.

Instead of using a single number, or point estimate, for the ECS, the IAMs use a distribution of possible values for the ECS. In essence, the distribution is a spectrum of values in which potential temperatures are weighted by their probability of occurrence. Because of the myriad factors that affect measured temperatures, estimates of ECS distributions are themselves uncertain and evolve as new data and theory are added to the process.

The IAMs used by the IWG to estimate the SCC are grounded on the specification of such an ECS distribution. Since 2010, the IWG has used an ECS distribution based on an academic paper by Gerard Roe and Marcia Baker published seven years ago.[8] Since then, a number of updated ECS distributions have been estimated, suggesting lower probabilities of extreme global warming.[9]

For instance, substituting the ECS of Otto et al. for the outdated Roe and Baker distribution, used in the 2013 TSD, causes the SCC for 2020 to drop 41 percent with the DICE model and over 60 percent with the FUND model.[10] There were similar reductions on the SCC for other years as well.

Discount Rate

Swapping income today for greater income in the future is investment. The logic underpinning a carbon tax is the same.—lower GDP today will provide even greater benefits in the future. Because there are many investment opportunities that can swap current income for even greater future benefits, it is necessary to compare alternative investments to the investments in moderating global warming. In the jargon of Economics 101, what is the opportunity cost of such an investment, and what is the alternative investment of the same magnitude that would provide the greatest alternative future benefit?

Stated another way, the trade-off is this: Instead of forcing the current generation to invest in climate policy, they could be forced to invest in infrastructure, machinery, tools, factories, or anything else that would lead to greater production (and therefore consumption) capacity in the future. It would not make sense to invest for future generations at 3 percent when, instead, they could reap the reward of a 7 percent return.

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[8]Gerard H. Roe and Marcia B. Baker, "Why Is Climate Sensitivity So Unpredictable?" *Science*, Vol. 318, No. 5850 (October 26, 2007), pp. 629–632.
[9]See supra note 6.
[10]Using the 3 percent discount rate chosen by the IWG.

Discounting is the tool used to make these comparisons and the correct rate is critical. OMB guidance stipulates that cost-benefit analysis should use discount rates of 3 percent and 7 percent.[11]

The IWG's TSD used 2.5 percent, 3 percent, and 5 percent discount rates, but neglected to report SCC values based on 7 percent. The IWG settled on 3 percent as the most reasonable discount rate and those are the values that have been used in regulatory rule-making. Comparing the SCC values in the DICE model for the year 2020, Heritage found the value dropped nearly 85 percent when the 7 percent discount rate was used. In the FUND model the SCC drops more than 100 percent and actually goes negative when the 7 percent discount rate is used.

Following the logic of a carbon tax implies that CO_2 emissions should be subsidized when the SCC is negative.

Declining Discount Rates and Economic Growth Rates

The case for very low discount rates (declining discount rates) is derived from Martin Weitzman's 1998 article on discounting the far-distant future.[12] Weitzman argues that when there is uncertainty about future discount rates, the lowest discount rate is the appropriate rate for "the far-distant future." In practice this has led to the case for using declining discount rates (DDRs). That is, the farther in the future a cost is incurred or a benefit is received the lower should be the discount rate.

In a recent article in *Science*, Arrow et al. provide a summary of and supporting example for the declining discount rate argument.[13] However, a close reading of both the *Science* article and Weitzman's original article reveals just how critical, and arguably contrived, are the assumptions needed to justify declining discount rates. Nevertheless, even with the assumptions ceded, declining discount rates cannot be used with the IAMs as set up in the IWG's analysis. The low discount rates that motivate DDRs require extended periods of stagnant growth; and the growth rates used by the IWG in the IAMs are too high to meet this criterion.

The following table is taken from Arrow et al.:

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[11]U.S. Office of Management and Budget, "Regulatory Analysis," Circular A-4, September 17, 2003, http://www.whitehouse.gov/omb/circulars_a004_a-4/ (accessed September 11, 2014).
[12]Martin L. Weitzman, "Why the Far-Distant Future Should Be Discounted at Its Lowest Possible Rate," *Journal of Environmental Economics and Management*, Vol. 36 (1998), pp. 201–208.
[13]K. Arrow et al., "Determining Benefits and Costs for Future Generations," *Science*, Vol. 341 (July 26, 2013), pp. 49–50.

PRESENT VALUE OF A CASH FLOW OF $1000 RECEIVED AFTER *T* YEARS					
t	Value ($) of $1000 at a discount rate of				Certainty equivalent (%)
	1%	4%	7%	Equally likely 1% or 7% expected value	
1	990.05	960.79	932.39	961.22	3.94
10	904.84	670.32	496.59	700.71	3.13
50	606.53	135.34	30.20	318.36	1.28
100	367.88	18.32	0.91	184.40	1.02
150	223.13	2.48	0.03	111.58	1.01
200	135.34	0.34	0.00	67.67	1.01
300	49.79	0.01	0.00	24.89	1.01
400	18.32	0.00	0.00	9.16	1.01

The column heading "Equally likely 1% or 7% expected value" and their description in the text, "Suppose that we think the interest rate is equally likely to be 1% or 7% in 100 years," could reasonable be interpreted as implying an annual coin flip to choose the discount rate. Instead, they have averaged the present value of two very unlikely outcomes—the first where the chosen interest rate is 1 percent every year for 100 years and the other is where the chosen interest rate is 7 percent every year for 100 years. Though the discussion about correlated discount rates later in the paper alludes to this assumption, many, if not most, readers are likely to believe the odds of 1 percent or 7 percent are equally likely in every year. Under the assumption that 1 percent and 7 percent have an equal chance every year, the two cases shown above each have a 7.9 x 10^{-31} chance of occurring. Most of the paths in the example above will have combinations of some years with a 1 percent rate and other years with a 7 percent rate.

Extreme Assumptions Needed for Declining Discount Rates

The *Science* paper refers to several other papers that also derive these declining discount rates. A necessity for all of them is that the lower discount rate must be in force for an extended period.

For a 300-year time horizon, the simplest split of equally likely 1 percent and 7 percent discount rates would be 150 years at 1 percent and 150 years at 7 percent. Discounting $1,000 for 150 years at 1 percent gives a present value of $224.79. Discounting this value for the remaining 150 years (for a total of 300 years) at 7 percent gives an ultimate present value of $0.0088. Note that using the average discount rate of 4 percent for the whole 300 years gives a present value of $0.0078. In fact, for the present value to even reach as high as $1.00, the 1 percent discount rate has to apply to at least 232 of the 300

years. If 1 percent and 7 percent are equally likely for each of those years, the probability of this occurring is 2.05×10^{-22}.

Correlated Discount Rates and Economic Growth Rates

To extricate themselves from the dismal probabilities of the previous paragraph, proponents of declining discount rates appeal to the possibility of correlated discount rates. In essence, the coin flips stop early in the game and we are stuck with the rate chosen on that last flip, which at the time of analysis is unknown.

Weitzman illustrates the uncertainty this way:

> When I try to imagine how the future world might look a century from now, I start by trying to conceptualize how people a century ago might have attempted to envision our world today. We have available now some important technologies, like computers or airplanes, that were essentially unimaginable 100 years ago. Maybe a now unimaginable "photon-based technology" will replace today's electronic technology and deliver such prodigious rates of technological progress with a clean environment that historians then will look back on the previous 100 years and smile at the modest projections of even the growth optimists at the close of the twentieth century. Or, who knows, maybe a century from now people will feel crowded and polluted and very disappointed in a pace of technological change that failed to maintain the productivity growth of the "golden age" of the industrial revolution during the earlier two centuries from 1800 to 2000.[14]

The people in the future envisioned by the IWG (and embedded in their IAMs) need not worry. They will not be disappointed because the IWG assumes future growth in per capita GDP that actually exceeds that of the U.S. for the past two centuries.

The per capita GDP growth rates for the reference scenarios listed by the IWG ranged from 1.58 percent to 2.03 percent per year with an average of 1.8 percent per year. On the other hand the Maddison Project estimates per capita GDP levels for the U.S. that grew only 1.56 percent per year from 1800 to 2000.[15] Over those same two centuries the real compounded annual rate of return in U.S. stock markets has been a "remarkably stable" 6.8 percent per year.[16] It would be reasonable to assign an even higher projected rate of return on capital in an environment where growth is projected to be in excess of 1.56 percent.

In short, the growth rates built into the IAMs exceed that of the past two centuries in the U.S. (and the world) and therefore rule out the possibility that Weitzman offers as

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[14] Weitzman, op. cit., page 203.

[15] J. Bolt and J. L. van Zanden, "The First Update of the Maddison Project; Re-Estimating Growth Before 1820," Groningen Growth and Development Centre, University of Groningen, 2013, Maddison Project *Working Paper* 4, http://www.ggdc.net/maddison/maddison-project/home.htm (accessed February 26, 2014).

[16] Jeremy J. Siegel, *The Concise Encyclopedia of Economics: Stock Market*, 2nd ed., Library of Economics and Liberty, http://www.econlib.org/library/Enc/StockMarket.html (accessed February 26, 2014).

justification for the very low discount rates. The IWG cannot simultaneously entertain arguments for low discount rates and project high GDP growth rates. At least until economic growth in the IAMs is re-worked to match the lower rates implied by DDRs there can be no argument for DDRs in the IAMs.

Summary

- Carbon taxes are bad for the economy as economic analysis by both the Heritage Foundation and the U.S. Energy Information Administration have projected.
- Reducing CO_2 with a carbon tax will have at most tenths of a degree moderation in global warming.
- Social cost of carbon estimates from the Interagency Working Group's 2013 technical support document are simply not credible and cannot justify the million lost jobs and trillions of dollars in lost income from a carbon tax.

Appendix

Overview of the Heritage Energy Model

The Heritage Energy Model (HEM) is a derivative of the National Energy Model System (NEMS).[17] NEMS is used by the Energy Information Administration (EIA) of the Department of Energy as well as various nongovernmental organizations for a variety of purposes, including forecasting the effects of energy policy changes on a plethora of leading economic indicators. The methodologies, assumptions, conclusions, and opinions in this report are entirely the work of statisticians and economists at The Heritage Foundation's Center for Data Analysis (CDA) and have not been endorsed by and do not necessarily reflect the views of the developers of NEMS.

HEM is based on well-established economic theory as well as historical data and contains a variety of modules that interact with each other for long-term forecasting. In particular, HEM focuses on the interactions among (1) the supply, conversion, and demand of energy in its various forms; (2) American energy and the overall American economy; (3) the American energy market and the world petroleum market; and (4) current production and consumption decisions as well as expectations about the future.[18] These modules include:

- Macroeconomic Activity Module,[19]

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[17]U.S. Department of Energy, Energy Information Administration, "The National Energy Modeling System: An Overview," http://www.eia.gov/oiaf/aeo/overview/pdf/0581(2009).pdf (accessed April 3, 2013).
[18]Ibid., pp. 3–4.
[19]HEM's Macroeconomic Activity Module makes use of the IHS Global Insight model, which is used by government agencies and Fortune 500 organizations to forecast the manifestations of economic events and policy changes on notable economic indicators. As with NEMS, the methodologies, assumptions, conclusions, and opinions in this report are entirely the work of CDA statisticians and economists and have not been endorsed by and do not necessarily reflect the view of the owners of the IHS Global Insight model.

- Transportation Demand Module,
- Residential Demand Module,
- Industrial Demand Module,
- Commercial Demand Module,
- Coal Market Module,
- Electricity Market Module,
- Petroleum Market Module,
- Oil and Gas Supply Module,
- Renewable Fuels Module,
- International Energy Activity Module, and
- Natural Gas Transmission and Distribution Module.

The HEM is identical to the EIA's NEMS with the exception of the Commercial Demand Module. Unlike NEMS, this module does not make projections regarding commercial floor-space data of pertinent commercial buildings. Other than that, however, the HEM is identical to NEMS.

Overarching the above modules is an Integrating Module that consistently cycles, iteratively executing and allowing the various modules to interact with each other. Unknown variables that are related (such as if they are a component of a particular module) are grouped together, and a pertinent subsystem of equations and inequalities corresponding to each group is solved via a variety of commonly used numerical analytic techniques, using approximate values for the other unknowns. Once these group's values are computed, the next group is solved similarly and the process iterates. Convergence checks are performed for each price and quantity statistic to determine whether subsequent changes in that particular statistic fall within a given tolerance. After all group values for the current cycle are determined, the next cycle begins. For example, at cycle j, a variety of n pertinent statistics represented by the vector $(x_1^j, x_2^j, \ldots, x_n^j) \in \mathbb{R}^n$ is obtained.[20] The HEM provides a number of diagnostic measures, based on differences between cycles, to indicate whether a stable solution has been achieved.

Carbon Tax Simulations and Diagnostics

We used the HEM to analyze the economic effects of instituting the Boxer–Sanders proposal. The HEM is appropriate for this analysis, as similar models have been used in the past to understand the economic effects of other carbon-tax proposals.[21] In particular, we conducted simulations running a carbon fee that started in 2014 at $20 (in 2013 dollars) and increased by 5.6 percent per year and compared this against a baseline model without any carbon tax. We chose a revenue-neutral carbon tax where 100 percent of the carbon tax revenues are returned directly to taxpayers. We ran the HEM for 12 cycles to

[20]S. A. Gabriel, A. S. Kydes, and P. Whitman, "The National Energy Modeling System: A Large-Scale Energy-Economic Equilibrium Model," Operations Research, No. 49 (2001), pp. 14–25.
[21]The Department of Energy, for example, has used NEMS to evaluate some carbon-tax proposals. See, for example, U.S. Department of Energy, Energy Information Administration, "AEO Table Browser," http://www.eia.gov/oiaf/aeo/tablebrowser/ (accessed April 2, 2013).

get consistent feedback into the Macroeconomic Activity Module, which provided us with the figures presented.

The diagnostic tests, based on differences between cycles, at the end of the 12 runs suggested that the forecasts provided by the model had stabilized. The 12 cycles were therefore sufficient to attain meaningful convergence, thus providing us with macroeconomic statistics from which we can make informative inferences.

Questions for the Record
Senate Finance Committee
"Reforming America's Outdated Energy Tax Code"
Hearing Date: September 17, 2014
Questions for Dr. David Kreutzer

Question from Senator Orrin Hatch

1. *This question is for the whole panel, starting with Senator Nickles and Doctor Kreutzer. There have been several energy tax provisions that many consider government spending through the tax code. These provisions have taken the form of grants or refundable tax credits.*
   I am curious if any of the witnesses believe that the tax code is an appropriate place for government outlays and if we should include any energy tax provisions that result in outlays in tax reform?

   Answer: Though fundamental scientific research can be an appropriate target for financial support from the government, it is not appropriate for the government to use either explicit expenditures or tax preferences to give one source of energy an advantage over others. However, the complexity of the current tax code often makes it difficult to distinguish between tax treatments that reflect actual costs of business from tax treatments that are unwarranted preferences. For example, the Section 199 manufacturing tax deduction is often depicted as an oil and gas subsidy. It is not an oil gas subsidy, it is a tax deduction available to all manufacturers, where "manufacturer" is so broadly defined that it includes newspaper publishers and software sellers. The effective impact of the Section 199 deduction is to reduce the corporate income tax by about three percent for this broadly defined set of manufacturers, except for the oil and gas industry for which the cut is only about two percent. Tax policy (for all industries including energy) would be much cleaner, less confusing, and fairer if all businesses could simply expense all costs. For a given year, the taxable income would be the simple difference between revenues and costs for that year. Of course if expenditures exceed costs for a year (such as when a firm starts up) then the costs can be spread out over subsequent years. Under such a system, refundable tax credits and other preferences could not hide behind the smoke screen of federal tax complexity.

Questions from Senator Mark Warner

1. *If you support an "all of the above" approach to energy policy, as I do, you want to ensure all of the eggs in our energy basket have an opportunity to grow. Whether it's a continuation of the benefits on hybrid and electric vehicles, a continuation of the Solar ITC (investment tax credit), or putting back into place modified residential energy retrofits (as I recommended with 25(c) in the EXPIRE Act). But I also know that getting to comprehensive tax reform will require give and take on both sides. My question is can you do all of this and reduce the overall tax rate? Where would the money come from?*

   Answer: An "all of the above" energy policy makes sense when it is a policy to allow cost-effective energy sources to thrive. "All of the above" cannot make sense if it is a policy to subsidize all energy sources that are not cost competitive. There simply are too many non-viable energy sources. For example, at the risk of provoking a letter-writing campaign from beekeepers and candlestick makers, I suggest we should not try to power a significant portion of our economy with beeswax.

   The energy sources that make sense are those that can be provided at a cost consumers are willing to pay. In these cases there is no need for any sort of special tax treatment as these forms of energy will be profitable without preferences.

   A common argument in favor of tax preferences and subsidies for some forms of energy is that others create negative externalities. In most cases these externalities have already been addressed through rules to limit these externalities. However, it is argued, none of these rules directly addresses the externalities from the CO2 emissions.

   Perhaps, but that does not make the case that the externalities from CO2 emissions are sufficiently large and negative to justify costly policies. Despite popular perceptions, it is not clear that CO2 emissions create externalities that are decidedly negative at this time. For instance, very reasonable alternative specifications for the models used by the Environmental Protection Agency to determine the impact of CO2 emissions (called the Social Cost of Carbon or SCC) dramatically change the value and even produce negative costs (implying net benefits from CO2 emissions).[1]

   Another common misperception is that markets do not account for the exhaustibility of non-renewable energy resources. Past experience and a robust economic literature indicate that markets do effectively allocate resources even when they are non-renewable.[2]

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[1] See, Kevin D. Dayaratna and David W. Kreutzer, "Unfounded FUND: Yet Another EPA Model Not Ready for the Big Game," Heritage Foundation *Backgrounder #2897*, April 29, 2014 (http://www.heritage.org/research/reports/2014/04/unfounded-fund-yet-another-epa-model-not-ready-for-the-big-game); and Kevin D. Dayaratna and David W. Kreutzer, "Loaded DICE: An EPA Model Not Ready for the Big Game," Heritage Foundation *Backgrounder #2860*, November 21, 2014 (http://www.heritage.org/research/reports/2013/11/loaded-dice-an-epa-model-not-ready-for-the-big-game).

[2] For a summary see: Jeffrey A. Krautkraemer, "Nonrenewable Resource Scarcity," *Journal of Economic Literature*, vol. 36, no. 4, December 1998, pp. 2065-2017.

Though funding basic scientific research may be a legitimate role for the federal government, there is no need for special tax preferences for any form of energy.

2. *In addition to providing certainty, it's also important to look at how we measure volatility with this. We certainty want to incentivize certainty and price signals will motivate those in industry. How can using the tax code to do an all of the above approach to energy policy, reduce price volatility?*

   Answer: The certainty that government should provide industry is a 100 percent certainty of zero special tax preferences.

TESTIMONY

Statement of
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Reforming America's Outdated Energy Tax Code

before the
Committee on Finance
U.S. Senate

September 17, 2014

Chairman Wyden, Senator Hatch, and Members of the Committee, thank you for the invitation to testify this morning on reforming the treatment of energy in the tax system. I make the following points in my testimony today.

- Energy policy is shaped in important ways by the federal tax system. While taxes on fuels are one instrument of tax policy, subsidies in the form of accelerated depreciation, percentage depletion, production and investment tax credits play an equally if not more important role.
- Economic efficiency is best achieved by setting tax rates to align the private and social costs of producing and using energy. In the context of energy, taxes should be levied on energy sources based on the negative externalities associated with their production or consumption.
- A well-designed carbon tax would align the private and social costs of burning fossil fuels. It could also raise significant revenue that could help finance equity and efficiency improving tax reforms.
- With a well-designed carbon tax, there would be no need for tax-based energy subsidies of any kind. In addition to eliminating tax expenditures on the oil and gas industry, tax expenditures for renewable sources could also be eliminated.
- In the absence of carbon pricing, a second-best technological neutrality can be achieved through the use of subsidies. The technology-neutral tax credit sketched out in the December 2013 Senate Finance Committee Staff Discussion Draft takes important steps in the right direction towards a balanced tax code that supports social efficiency in energy production.

I. Background

The tax code has long been an important instrument for energy policy. Accelerated depreciation, percentage depletion, deductions, and tax credits are all tax-based tools for reducing the cost of producing energy. The Energy Information Administration's most recent analysis of federal financial interventions in energy markets notes that expenditures through the tax system account for 43 percent of all federal support (see Table 1 below).[1] This is lower than the share in 2007 when tax expenditures accounted for nearly two-thirds of total federal support and reflects, in large measure, the importance of the 1603 cash grant program for renewable electricity production through the American Reinvestment and Recovery Act (ARRA).

Subsidies through the tax code play an especially important role in supporting fossil fuel and renewable energy production. They play a smaller role in supporting nuclear power production though this could change over the next decade. Production tax credits for new nuclear power production put in place in the Energy Policy Act of 2005 could significantly increase federal tax expenditures for this source of electricity. Support for renewable energy through tax expenditures has risen with its share in FY 2010 exceeding one-half of the energy related tax expenditures in the tax code. Finally,

[1] Energy Information Administration. 2011. *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010*. Washington, DC: EIA. A tax expenditure is a reduction in tax revenue arising from a special provision for some type of economic activity.

EIA documents that total federal subsidies and support for energy have more than doubled between 2007 and 2010 (in year 2010 dollars). Energy related tax expenditures have grown more slowly, rising by 41 percent over this period.[2]

Table 1. Federal Support for Energy: FY 2010 ($ Millions)

Fuel	Tax Expenditures	Total Support	Share of Total Support	ARRA Related
Coal	561	1,358	41%	97
Natural Gas and Petroleum Liquids	2,690	2,820	95%	0
Nuclear	908	2,499	36%	147
Renewable Energy	8,168	14,674	56%	6,193
Electricity (not fuel specific)	58	971	6%	495
End Use and Conservation	3899	14,838	26%	7,854
Total	16,284	37,160	44%	14,786

Source: Table ES-2, Energy Information Administration. 2011. *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010.* Washington, DC: EIA.

As of 2013 there were 42 tax preferences related to energy production and consumption.[3] The number of incentives in the tax code makes it difficult to assess their relative effectiveness and the extent to which they favor certain types of fuels over other fuels. I turn to this issue next.

II. Rationale and Guiding Principles for Energy Tax Reform

Let me begin by discussing *why* the federal tax system should intervene in energy markets through either taxes or subsidies. Economic theory provides clear prescriptions for situations where interventions through the tax code can improve social welfare. Externalities provide the most relevant rationale for the energy sector.[4] If the production or consumption of energy has as a by-product the creation of an externality (e.g. pollution) then social welfare can be improved through government intervention. One way to do this is by taxing the externality. Thus a tax on the sulfur content of fossil fuels,

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[2] In contrast, total support for energy doubled in real dollars between 1999 and 2007 while tax expenditures more than tripled. See Energy Information Administration. 2008. *Federal Financial Interventions and Subsidies in Energy Markets 2007.* Washington, DC: EIA SR/CNEAF/2008-01.

[3] *Summary of Staff Discussion Draft: Energy Tax Reform,* Chairman Max Baucus, U.S. Senate Committee on Finance, December 18, 2013.

[4] Another reason for federal involvement in energy markets is an energy security concern related to the heavy reliance of our transportation sector on petroleum. Over ninety percent of primary energy consumption in the transportation sector comes from petroleum based fuels. (EIA data at http://www.eia.gov/energyexplained/). Supply diversification is a reasonable risk management strategy in light of this heavy reliance in transportation on oil (see Gilbert E. Metcalf, "The Economics of Energy Security," *Annual Review of Resource Economics*, forthcoming). I do not pursue this issue here but note that carbon pricing is likely to contribute to fuel supply diversification in transportation.

for example, would be an efficient response to acid rain damages arising from fossil fuel consumption for electricity generation. This is an example of a Pigouvian tax.[5] It "internalizes the externality" by forcing firms to take into account the social costs of pollution by raising their private costs by the value of the social damages that are generated by the pollutant. This approach implicitly makes clear that pollution generating activities have social benefits as well as costs. Optimal policy must balance those costs against the benefits; the tax is an efficient means of effecting that balance.

Rather than taxing activities that create negative externalities, we can provide subsidies to activities that are substitutes for externality generating activities. Put simply, if fuel X generates pollution damages while fuel Y does not, we can raise the price of fuel X relative to fuel Y to reflect the social damages from burning fuel X or we can reduce the price of fuel Y. Either approach encourages firms to use less of fuel X and more of fuel Y. This is the essential approach taken through federal energy tax policy. In large measure, we subsidize energy activities that we would like to encourage rather than tax activities that we would like to discourage.

What are the externalities that are of significant concern that drive federal tax policy towards energy? The externality of primary concern is greenhouse gas emissions that add to the growing concentration of greenhouse gases in the atmosphere. Fossil fuel combustion in the United States was responsible for over three-quarters of domestic greenhouse gas emissions in 2012.[6] Any policy to reduce U.S. greenhouse gas emissions must have as a key element incentives to shift from fossil to renewable fuels consumption.

Energy production and consumption are associated with negative externalities in addition to climate change. I do not focus on those here because many of these negative externalities are currently addressed through regulatory means. For example, the Acid Rain Program run by the Environmental Protection Agency has been a highly cost-effective response to the damages from releasing sulfur dioxide in fossil fuel electric generation units. Moreover the current set of energy subsidies is arguably focused to a large extent on reducing greenhouse gas emissions. For the purposes of this testimony I will take as given that, going forward, tax policy will be predominantly concerned with greenhouse gas emissions and that any assessment of energy tax policy must consider, among other things, the degree to which policy reduces emissions.

In terms of policy design, key principles include stability and clarity in policy, cost effectiveness, and adverse interactions among existing policies. Stability and clarity are important given the long-lived nature of most major energy capital investments. The

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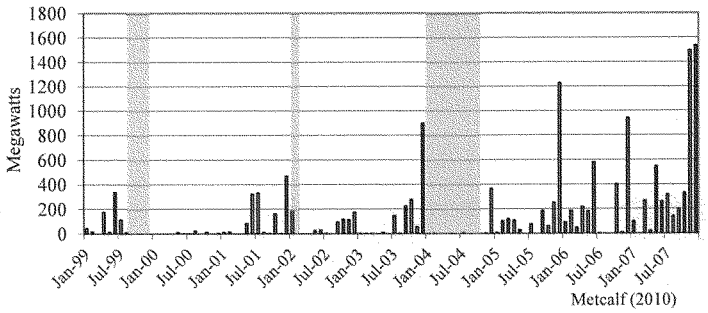
[5] Named for the economist Arthur C. Pigou, an early proponent of this policy instrument in Arthur C. Pigou, 1938. *The Economics of Welfare*. London: Weidenfeld and Nicolson. A comparable approach – and the one taken to address acid rain – is to create a cap-and-trade system for SO_2. Either approach puts a price on emissions of SO_2 and provides the appropriate price signal to electric utilities to reduce emissions.

[6] See Environmental Protection Agency. 2004. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2012*. Washington, DC: Environmental Protection Agency, EPA 430-R-14-003.

historic pattern of two-year authorization cycles for renewable electricity production tax credits has created great uncertainty in the wind industry and led to boom and bust cycles that raise the cost of renewable energy investment. Figure 1 below is from an analysis I did of wind capacity investments in the United States. It illustrates the fall-off in investment during periods in which the section 45 production tax credit lapsed.[7] Greater certainty over the production tax credit would smooth out investment and reduce bottlenecks in turbine and other equipment manufacture that delay projects and raise costs.

Figure 1. Wind Capacity Additions



Energy tax policies are more cost effective to the degree that any tax benefits are closely linked to new and additional projects that would not have been developed in the absence of the tax initiative. More precisely, subsidies should be designed to benefit marginal projects as much as possible. A recent example where this principle was violated was the $.50 per gallon alternative fuels mixture credit. This credit was intended to encourage the addition of biodiesel and other biomass based fuels to petroleum to reduce petroleum use. It became clear that many paper firms were taking the credit for mixing diesel fuel with black liquor, a biomass by-product of paper making that historically has been used by the industry as a fuel source for their boilers. Controversy arose over whether paper firms were adding diesel fuel to black liquor purely for the purpose of claiming the tax credit biodiesel mixture tax credit.[8] This was troubling on two levels. First, a tax credit's cost effectiveness is driven down as credits are taken for inframarginal activities. This is a common problem with any subsidy. We want to provide the incentive to firms that would not have undertaken the desirable activity in the

[7] Gilbert E. Metcalf, 2010, "Investment in Energy Infrastructure and the Tax Code," *Tax Policy and the Economy*, 24: 1 – 33. In all cases the credit was retroactively reauthorized though this was not known with certainty beforehand. Based on a statistical analysis I undertook in that paper, the elasticity of investment with respect to the user cost of capital (which takes into account the production tax credit) exceeds 1 in absolute value. Tax policy is a powerful driver of investment.

[8] See Jan Mouawad and Clifford Krauss. 2009. Lawmakers May Limit Paper Mills' Windfall. *New York Times*, April 18, 2009.

absence of the subsidy. But we don't want to provide the subsidy to firms that would have undertaken the activity regardless of the subsidy. But the example from the paper industry was troubling beyond the inframarginal nature of the subsidy. To the extent that the tax credit raised the demand for diesel fuel in order to make the biofuel eligible for the credit, then it had the perverse effect of raising rather than lowering demand for petroleum products.[9]

III. Carbon Tax as First Best Energy Policy

The most efficient way to reduce greenhouse gas emissions is to put a price on those emissions to align the private and social costs of using greenhouse gas emitting fuel sources. Since energy related carbon dioxide emissions account for the vast bulk of emissions, a carbon tax on fossil fuels would be a cost effective and administratively straightforward way to reduce those emissions. It is a textbook example of a Pigouvian tax. I have written at length on the mechanics of how the U.S. government could design a carbon tax.[10] The message from that research is that it is administratively straightforward to implement a carbon tax in a way that balances equity and efficiency concerns. In a recent paper I carried out an analysis of a $20 per ton carbon tax and estimate that it would raise roughly $100 billion annually in the initial years. This would provide sufficient revenue to lower the payroll tax by roughly 1.5 percentage points (combining cuts to employer and employee rates) or to finance nearly an 8 percentage point reduction in the corporate income tax.[11] Whether the carbon tax revenue is used to lower personal and/or corporate income tax rates, is used to finance investment incentives, is given back to households in some lump sum fashion, or in some combination, what is clear is that the revenue provides the fiscal flexibility to contribute to a comprehensive tax reform package while maintaining overall budget neutrality for the federal government.

If a carbon tax were put in place, it would have an additional revenue benefit as there would no longer be a need for the section 45 and 48 renewable energy tax credits, and various other credits designed to encourage reduced emissions in the energy sector. At the same time other energy related tax credits could be eliminated including expensing for exploration and development costs of oil and gas, replacing percentage depletion with cost depletion, and the accelerated amortization of geological and geophysical expenses in oil and gas. Eliminating all these subsidies would reduce tax losses by more than $30 billion over the FY 2015 – 2019 budget window.

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[9] The perverse impact of policy is not limited to the biodiesel mixing tax credit. Research by Holland, Hughes, and Knittel suggest that low carbon fuel standards may have the perverse effect of increasing net carbon emissions. See Stephen P. Holland, Jonathan E. Hughes, and Christopher R. Knittel. 2009. Greenhouse Gas Reductions under Low Carbon Fuel Standards? *The American Economic Journal: Economic Policy* 1 (1):106-146.

[10] See Gilbert E. Metcalf and David Weisbach, "The Design of a Carbon Tax," *Harvard Environmental Law Review*, 33:2(2009): 499 – 556. Also see Gilbert E. Metcalf, "Paying for Greenhouse Gas Reductions: What Role for Fairness?" *Lewis & Clark Law Review*, 15:2 (2011): 393 - 415.

[11] These estimates include any revenue loss in taxes that must be made up with revenue from the carbon tax. Gilbert E. Metcalf, "Using the Tax System to Address Competition Issues with a Carbon Tax," *National Tax Journal*, forthcoming.

Finally, a stable carbon tax with a tax rate set roughly equal to the social cost of carbon would make the EPA's Clean Power Plan redundant. In addition to avoiding the administrative cost of designing state implementation plans in each state, efficiency would be enhanced to the extent that state plans are not designed to equalize the marginal cost of abatement across the country.[12]

IV. Myths About a Carbon Tax

There are a number of myths about a carbon tax that it is important to dispel.

Myth: A carbon tax is an economy killer. The EIA Annual Energy Outlook 2014 modeled a $25 per ton CO_2 tax rising at five percent through 2040 and estimated near term job losses between 0.4 and 0.8 percent as the economy transitions toward a lower carbon economy. Longer term job losses are much lower. By 2025, employment impacts have become negligible or positive.

The AEO analysis recycles the revenue in a lump sum fashion. Were the revenues to be recycled through reductions in corporate or personal income tax rates, any economic losses including job losses would be reduced due to the reductions in tax distortions arising from lower tax rates.[13] In general studies find modest economic losses from a well-designed carbon tax. These are losses relative to a "business as usual" (BAU) benchmark in which there is no carbon tax. The BAU benchmark shows long-run economic growth so any economic loss from a carbon tax simply means slightly slower growth than in the absence of the tax. In other words, the economy continues to grow in the presence of a carbon tax and our emissions are reduced.

Myth: A carbon tax will be ineffective at reducing global emissions. This is not so much a myth as it is a red herring. The United States is currently the second largest emitter of greenhouse gases globally behind China. Going forward, emissions from developing countries will exceed those from developed nations by a substantial amount. Greenhouse gases are a global pollutant and a global externality. As such, it will require significant effort by all major emitting nations. While a domestic carbon tax by itself will have a modest impact on global emissions, it is an important element in a global strategy to reduce emissions. While there is no guarantee that unilateral action by the United States to reduce emissions will affect policies in China and other major developing countries, it is absolutely guaranteed that failure to act by the United States will mean other major countries will not take action. Any action taken by the United States should include provisions to address failure to act by other major emitting countries. This could include

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[12] If different states have different marginal costs of abatement in equilibrium, there would be potential gains from trade in which low cost states increase their abatement and high cost states reduce their abatement. These gains, however, would not necessarily be realized. A national carbon tax brings about this equilibration across states automatically.

[13] See, for example, Lawrence Goulder and Marc Hafstead, 2013, "Tax Reform and Environmental Policy," RFF Discussion Paper 13-31. While this paper does not measure employment impacts directly, it notes that the loss in GDP (relative to a growing baseline) is reduced by 40 to 60 percent if the revenues are used to cut personal or corporate income tax rates.

border tax adjustments on imports from countries not pricing emissions or carbon tax credits for energy intensive and trade exposed sectors competing with those countries.

Myth: The social cost of carbon cannot be estimated with any precision and therefore cannot serve as the basis for federal policy. Estimating the social marginal damages from greenhouse gas emissions is an immensely complex task and all integrated assessment models (IAMs) that undertake that challenging task make clear that considerable uncertainty exists with respect to estimates. While there is great uncertainty over point estimates of damages at any point in time, there is no reason to believe that the correct estimate of damages is zero. Most criticisms of IAMs complain that the models ignore important non-linear impacts that while low probability would be catastrophic.[14] In other words, the social cost of greenhouse gas emissions is likely biased towards zero. Even MIT economist Robert Pindyck, who has written perhaps the most scathing criticism of IAMs and their use in carbon policy, does not believe the correct carbon price is zero:

> "My criticism of IAMs should *not* be taken to imply that, because we know so little, nothing should be done about climate change right now, and instead we should wait until we learn more. Quite the contrary. One can think of a GHG abatement policy as a form of insurance: society would be paying for a guarantee that a low-probability catastrophe will not occur (or is less likely). As I have argued elsewhere, even though we don't have a good estimate of the SCC, it would make sense to take the Interagency Working Group's $21 (or updated $33) number as a rough and politically acceptable starting point and impose a carbon tax (or equivalent policy) of that amount."[15] (p. 872)

V. Technology Neutral Energy Subsidy Policy

While carbon pricing would be an economically efficient approach to addressing the problem of climate change, the political difficulties associated with implementing a carbon price mean it is likely we will continue to rely on the subsidies through the tax code to provide the appropriate price signals. Subsidies are a mirror of taxes and as such can be used to align prices between clean and dirty fuels to reflect the social marginal damages from burning dirty fuels. A tax on dirty goods raises their price relative to that of clean goods. Similarly a subsidy to clean goods raises the price of dirty goods relative to that of clean goods. There are drawbacks from relying on subsidies rather than taxes as I have discussed elsewhere. But if carbon pricing is not politically feasible, clean energy subsidies can still contribute to economic efficiency.[16]

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[14] See, for example, the issues identified in William Nordhaus, 2014, "Estimates of the Social Cost of Carbon: Concepts and Results from the DICE-2013R Model and Alternative Approaches," Yale University.

[15] Robert Pindyck, 2013, "Climate Change Policy: What Do the Models Tell Us?", *Journal of Economic Literature*, 51(30): 860-872.

[16] I have analyzed the difficulties with using subsidies in Gilbert E. Metcalf, "Tax Policies for Low-Carbon Technologies" *National Tax Journal* LXII.3 (2009): 519-533. See also my testimony before the Senate Committee on Finance on April 23, 2009, available at http://www.finance.senate.gov/imo/media/doc/042309gmtest.pdf.

There are two elements to a cost effective subsidy-based approach to reducing greenhouse gas emissions through the tax code. First, the tax preferences for coal, oil, and gas should be repealed. In particular, expensing intangible drilling costs as well as exploration and development costs of oil and gas wells treat investments in these fossil fuel properties differently than other investments in which up-front costs lead to streams of revenue over time. The standard tax treatment for such costs is to allocate the costs over the life of the well thereby providing an accurate measure of net income under our income tax system. Similarly, independent oil and gas producers should be required to apply cost depletion to their reserves instead of percentage depletion. Again, this is in accordance with standard income tax treatment of asset reserves and levels the playing field between oil and gas assets and other physical assets. My 2010 analysis on the effect of the tax code on energy infrastructure investment found that the expensing of intangible drilling costs and the use of percentage depletion by independent oil drillers led to a negative effective tax rate on capital investment and a thirty percentage point differential between the effective tax rate on firm able to expense IDC's and utilize percentage depletion and those that could not.[17] This contributes to the inefficient allocation of capital across and within industries.

Second, an efficient energy policy should not favor one energy source over another after taking into account any positive or negative externalities associated with its production or consumption. This is the concept of technology neutrality. With our focus on global warming due to anthropogenic greenhouse gas emissions, a technology neutral policy would raise the relative price of dirty to clean fuels by the same amount based on the carbon content of fuels and not based on specific technologies. A tax credit based on the percentage reduction in carbon content per unit of energy of different fuels could be designed to be technologically neutral. The Senate Committee on Finance Chairman's Staff Discussion Draft to Reform Certain Energy Tax Provisions (December 18, 2013) addresses several problems with the existing mix of tax incentives. Specifically the reform proposal in the Staff Discussion Draft:

- reduces the number of incentives and consolidates them into incentives that focus on measuring results rather than rewarding particular technologies (technological neutrality);
- eliminates the policy uncertainty that results from the need to reauthorize tax preferences regularly while ensuring that clear and transparent benchmarks are set so that the policies may phase out as they are no longer needed; and
- makes tax benefits available to all technologies that reduce carbon emissions per unit of energy relative to a benchmark level of carbon intensity.

Such an approach as is sketched out in the Staff Discussion Draft would provide greater clarity and rationality to the current tax code and would be a major improvement over the current system. While an improvement, it is not a first-best policy. By subsidizing clean energy, the overall cost of energy is reduced thereby encouraging

[17] Gilbert E. Metcalf, 2010, "Investment in Energy Infrastructure and the Tax Code," *Tax Policy and the Economy*, 24: 1 – 33.

greater energy use and so giving up one of the channels by which energy-related pollution is reduced. It also is less cost effective to the degree inframarginal investments receive subsidies. Given that we are operating in a second-best world, however, where the political climate is not yet ready for carbon pricing, The Staff Discussion Draft approach would likely provide significant gains in low and no-carbon energy provision at a cost-effective price.

VI. Conclusion

Current energy tax policy can perhaps be best viewed as a transitional policy until policies such as carbon pricing (whether through a carbon tax or a cap-and-trade system) are put in place. A carbon tax would provide the correct signal to the economy about the social cost of energy production and consumption and so improve economic efficiency. It would raise significant revenue that could be used to lower other taxes and so further increase economic efficiency and fairness in the tax system. Finally, it would allow Congress to repeal a large number of energy tax subsidies that would no longer be necessary once carbon pricing is put in place. This further strengthens the federal fiscal position allowing non-energy tax rates to be lowered even further.

Until carbon pricing is politically feasible, there is much Congress can do to modify existing subsidies in the tax system to achieve technology neutrality and stability in energy policy that incentivizes long-lived clean energy investments. Policies should provide a level playing field in the sense that the subsidy per unit of externality avoided should be comparable across technologies. They should also consider the extent to which true reductions in the externality occur and avoid unintended consequences. This is all very easy to say but difficult to do. But so long as our energy policy is built around providing subsidies for activities we wish to support as opposed to taxing those activities we wish to discourage, we will always face difficult design problems that complicate our efforts to achieve efficient and cost effective outcomes. Having said that, streamlining renewable energy tax preferences, making them technologically neutral, and phasing out fossil fuel tax preferences would be a major improvement over the current tax code.

Thank you for the opportunity to testify today.

Questions for the Record
Senate Finance Committee
"Reforming America's Outdated Energy Tax Code"
Hearing Date: September 17, 2014
Questions for Dr. Gilbert Metcalf

Question from Senator Orrin Hatch

1. *This question is for the whole panel, starting with Senator Nickles and Doctor Kreutzer. There have been several energy tax provisions that many consider government spending through the tax code. These provisions have taken the form of grants or refundable tax credits.*

   I am curious if any of the witnesses believe that the tax code is an appropriate place for government outlays and if we should include any energy tax provisions that result in outlays in tax reform?

   Answer: Spending through the tax code can take many forms. It may take the form of tax credits (both refundable and non-refundable) or tax deductions. Tax credits in the area of energy include production tax credits for renewable energy and investment tax credits for certain energy capital spending. Tax deductions include accelerated depreciation (including expensing) for certain oil and gas investments as well as renewable capital and electricity transmission capital and the use of percentage rather than cost depletion for oil and gas reserves.

   The tax system plays a number of beneficial roles beyond simply collecting taxes to fund government services. In particular it can help address market failures. One market failure is pollution. Pollution is simply the recognition that the social cost of some private market activities diverge from the private cost. Health, environmental, and productivity damages from greenhouse gas emissions mean that the social cost of using fossil fuels exceeds the private cost. We know that when we underprice a resource we tend to overuse it. This is costly to society.

   For nearly one hundred years, economists have understood that the tax system can be used to correct pollution based market failures. Specifically a *"Pigouvian Tax"* set equal to the difference between the social and private cost of consuming fossil fuels can improve overall economic efficiency. This is the economic rationale for a carbon tax.

   If the political coalition to enact a carbon tax does not exist, a second-best approach is to provide tax benefits to clean (e.g. non-fossil based) fuels to encourage their use. Since an important mechanism to reduce greenhouse gas emissions is to shift the economy from fossil to non-fossil fuels, we can do that by raising the price of fossil fuels or lowering the price of non-fossil fuels. That is the rationale for the clean energy tax credits in the tax code.

My answer then in brief is that there is a place in the tax code for energy tax provisions that reduce tax collections. But that does not mean that there is no scope for improvement in the complex system of clean energy tax credits that exist. Reducing the number of tax credits and making them technology neutral would reduce confusion and complexity in the tax code.

Providing legislative certainty that the credits will not lapse (or be at risk for lapsing) every two years would also send a strong signal to business that investing in clean energy infrastructure is a prudent and worthwhile investment. Lastly eliminating credits for oil and gas investment (percentage depletion and expensing of intangible drilling costs) would align the oil and gas industry with tax practices of all other major manufacturing sectors. The Committee on Finance's Staff Discussion Draft on Energy Tax Reform from December 2013 is a valuable step in the right direction of rationalizing and simplifying the energy tax code.

Lastly, Congress should move quickly on an energy tax credits extenders bill before the end of the calendar year to avoid doing further damage to our nascent renewable energy manufacturing sector. The United States can be a global leader in clean energy innovation and manufacturing that can provide thousands of jobs for the U.S. economy. But with uncertain and erratic federal policy, we risk ceding our leadership to countries such as China and Germany that have been clear through their policy making that the future of energy in the twenty-first century includes a central role for renewable energy sources. We can be leaders or we can follow as other countries choose to lead. The choice is yours.

Senate Finance Committee – "Reforming America's Outdated Energy Tax Code"
The Honorable Don Nickles, U.S. Senate 1981-2004
Chairman and CEO, The Nickles Group, LLC
September 17, 2014

Chairman Wyden, Ranking member Hatch, and members of the committee, thank you very much for inviting me to speak to you today about energy tax policy. When I look back at my twenty-four years of Senate service, I enjoyed working on this committee more than just about anything else, and in particular working with many of you on tax policy. It is an honor and a privilege to be invited back to work with you on those issues again.

Mr. Chairman, the opinions I give today are solely my own, but I believe it is important to disclose that I and my company The Nickles Group are proud to represent some of the finest energy companies in the world, including ExxonMobil, Exelon, Anadarko Petroleum, National Oilwell Varco, Koch Industries and ITC Holdings. I am also a member of the corporate boards of Valero Energy and the Washington Mutual Investors Mutual Fund.

Chairman Wyden, I sat in this witness chair just a little over two years ago when your predecessor Senator Max Baucus invited me to the committee to talk about tax reform and energy tax policy. I praised Senator Baucus and House Chairman Dave Camp at that hearing for all the work they were doing to prepare for tax reform, and I was excited about the potential for getting the job done. Here we are two years later, and while comprehensive tax reform has not yet been achieved, leaders like Chairman Camp did make significant progress. But as we all know, there is a lot of more work to be done. I know that the leaders of this committee are among the smartest and hardest workers in the Senate, and so I encourage you to continue your work and finish the job.

My primary message at that hearing two years ago was that, if you do tax reform correctly, there would be no reason to hold another "energy" tax hearing,

because a reformed tax code should treat energy companies and the products they produce just like everybody else. No subsidies, and no penalties. If the tax code you devise encourages investment, lowers the corporate rate, and embraces a simplified territorial system, U.S. energy companies will flourish along with all other companies.

There remains a great deal of work to achieve that reformed tax code. In the meantime, a large number of tax provisions primarily affecting businesses have expired and await Congressional action. I agree with Chairman Camp that a few of those provisions – particularly those which encourage investment like bonus depreciation and small business expensing – should be made permanent. Others, such as the wind production tax credit (wind PTC) should remain expired.

Fellow Oklahoman Will Rogers said, "All government programs have three things in common: a beginning, a muddle and no ending." Perhaps the best example of this is the wind PTC.

The wind PTC is an overly-generous subsidy supporting a mature industry which has expanded ten-fold in the last decade and now accounts for over 60,000 megawatts of installed generation capacity. It is an industry that also benefits from a renewable portfolio standard mandate in 29 states and the District of Columbia, and which will further benefit from President Obama's aggressive regulatory agenda on existing and new power plants. The wind PTC's 2.3-cent-per-kilowat subsidy is 30-to-50 percent of the average wholesale cost of electricity in most regions of the country. And as my friend Congressman Mike Pompeo (R-KS) recently pointed out, the wind PTC has been around long enough – twenty-three years – that it is old enough to drink.

In fact, Mr. Chairman, the wind PTC is so generous that in parts of the country where electricity is bought and sold in wholesale markets, wind developers will actually pay the market to take their power because they cannot otherwise collect the subsidy. This ridiculous situation is killing base-load coal and nuclear power in those regions because they cannot afford to give their product away.

Subsidies like the wind PTC are inherently political, but I wonder how many members of this committee know that a few weeks ago the IRS issued regulations that dramatically expanded which windmills qualify for the credit? When Congress last renewed the credit, they changed the effective date to say that anyone who started construction of their wind project by the end of 2013 could qualify for the ten-year subsidy. Originally, the IRS generously interpreted "beginning construction" to be met if the developer spent a mere 5 percent of the total project costs – hardly a high bar. However, apparently even that was not generous enough for the President's friends in the wind industry, so in August the IRS lowered the threshold to 3 percent (IRS Notice 2014-46). I would encourage this committee to ask the IRS which wind projects and which companies benefited from this regulatory generosity, as well as where those companies are domiciled.

My former colleagues, the wind PTC has been around for twenty-three years, and projects that qualified under the President's new regulations will continue receiving the credit until 2024! Please save the American taxpayer $13 billion and let the wind PTC remain expired.

As I previously mentioned, a properly reformed tax code also should not penalize energy companies or their products. That is a message which has clearly been lost on this President, who has year after year asked Congress to increase taxes on domestic oil and gas companies because he does not like their products. I originally ran for the Senate because I wanted to reverse President Carter's energy policies that were hostile to domestic energy production, picked winners and losers, and stifled competition. Today I see our current President seeking to repeat many of the energy and tax policy mistakes of the Carter era.

We are experiencing a major renaissance in the domestic oil and gas industry, Mr. Chairman. The International Energy Agency predicts that the U.S. will be the world's number one producer of oil by 2015. In 2013 we reduced our imports of oil by 15 percent and of natural gas by 32 percent. Our exports of refined

products have increased 60 percent since 2010 and we are now the world's largest combined producer of oil and natural gas.

When the President first proposed his energy tax increases in 2009, the domestic oil and gas industry was investing $232 billion. Last year the industry invested $322 billion, a 40 percent increase. This industry is the shining light in our otherwise lackluster economy, but if the President's proposals had been enacted that amazing growth would have been threatened.

The President's punitive proposals include denying oil and gas companies the Section 199 manufacturing deduction that all other manufacturers receive. In fact oil and gas companies already receive a smaller benefit than all other manufacturers, but the President believes even that should be taken away. He would also dramatically increase the cost of exploring and drilling by increasing the recovery period intangible drilling costs. IDC's are the ordinary and necessary business expenses of this industry, Mr. Chairman, and they should remain immediately deductible. And the President would also like to penalize U.S.-based oil and gas companies and disadvantage them relative to their foreign competitors by denying them a credit for taxes paid to foreign governments. Known as the "dual capacity" provision, this proposal would cause U.S. companies to be double-taxed and would be disadvantage them as they compete to win access to oil and gas production projects all over the world.

Mr. Chairman, I appreciate all the work this committee and the House committee have done over the last two years to prepare for tax reform. Chairman Camp in particular did us all a big favor by putting a complete, detailed plan on the table for everyone to read, model, and evaluate. I certainly do not agree with every aspect of Chairman Camp's plan, but I admire his courage and the tremendous amount of work he and his staff put into the effort. With regard to energy taxes, I think Chairman Camp got more right than wrong. He would end targeted renewable subsidies like the wind PTC, and preserve important cost recovery mechanisms like expensing of intangible drilling costs. He repeals the Section 199 manufacturing deduction for everyone – not just oil and gas – because they all

benefit from a lower corporate rate. And his territorial international tax system would not double-tax U.S. oil and gas companies.

Unfortunately, the energy tax reform and cost recovery discussion drafts released by Chairman Baucus before he left the Senate I fear head largely in the wrong direction. Those discussion drafts would require intangible drilling costs and other company's R&D expenses to be amortized over 60 months. Companies need to be able to expense these costs in the year incurred. Senator Baucus' discussion drafts also took the wind PTC and put it on steroids, creating a never-ending subsidy for renewable electricity based on carbon content. I would encourage the committee to reject this unnecessary and expensive proposal.

Mr. Chairman and members of the committee, we all know that our uncompetitive tax code is badly in need of repair. The Tax Foundation just this week published a new metric which measures the degree to which the 34 OECD countries' tax systems promote competitiveness. At the top of the list was Estonia, with a 21 percent corporate rate and no double taxation of dividend income. The U.S. ranked a miserable 32 out of 34, just barely edging out France and Portugal for the least competitive tax system. Further skewing the tax code to promote renewables at the expense of traditional energy resources will do nothing to make us more competitive.

Thank you again for the opportunity to testify today, Mr. Chairman. I look forward to discussing these issues further.

Questions for the Record
Senate Finance Committee
"Reforming America's Outdated Energy Tax Code"
Hearing Date: September 17, 2014
Questions for the Honorable Don Nickles

Question from Senator Orrin Hatch

1. *This question is for the whole panel, starting with Senator Nickles and Doctor Kreutzer. There have been several energy tax provisions that many consider government spending through the tax code. These provisions have taken the form of grants or refundable tax credits.*

   I am curious if any of the witnesses believe that the tax code is an appropriate place for government outlays and if we should include any energy tax provisions that result in outlays in tax reform?

   Answer: Senator Hatch, I have long opposed using the tax code to redistribute income, for individuals or businesses. Refundable credits are extremely difficult for the IRS to administer and easily subject to fraud and error as we've seen with the Earned Income Tax Credit (EITC) for low-income individuals. The IRS estimates that 21-25 percent ($11.6 billion to $13.6 billion) of EITC payments were issued improperly during fiscal year 2012. I believe it is a mistake to use refundable tax credits for any type of business tax subsidy.

Questions from Senator Patrick Toomey

1. *During your opening remarks, you noted the negative impact that the wind production tax credit (PTC) has on our nation's financial situation and that it destroys one job in the traditional energy sector for each job it creates in the wind energy sector. I also believe the PTC increases the total cost of electricity production—which all Americans pay for through a greater tax burden—and displaces reliable sources of electricity. Do you believe that the wind PTC negatively impacts the reliability and stability of our nation's power grid?*

   Answer: Senator Toomey, the PTC has dramatically expanded the amount of wind generation in the U.S., and that variable nature of that generation has created significant problems for grid operators whose job it is to maintain system reliability and stability. Our nation's power grid must be fine-tuned at every moment to ensure that supply equals demand. Wind generation's variability means grid operators must have sufficient backup in case it stops. However as I testified, wind subsidies are so generous that they are crowding out other types of generation.

   Jonathan Lesser, President of Continental Economics, Inc., presented excellent testimony on this subject last year before the House Energy and Power Subcommittee, which you can find at this link:
   http://democrats.energycommerce.house.gov/sites/default/files/documents/Testimony-Lesser-EP-Energy-Security-Grid-Reliability-2013-5-9.pdf

2. *I believe that natural gas has great potential to become a widely used transportation fuel. It is clean burning and can significantly reduce our dependence on foreign oil. Liquefied natural gas (LNG), for example, could compete against diesel as a fuel source for heavy duty work trucks. The existing tax regime for transportation fuels, however, unfairly discriminates against LNG by taxing a gallon of LNG at the same rate as a gallon of diesel, despite the fact that LNG has roughly 60% of the energy density of diesel. Therefore, I was pleased that Chairman Wyden and Senator Burr worked to include reforms in the most recent Senate Highway Bill that established tax parity between diesel and LNG on an energy equivalency basis, rather than on a volumetric equivalency basis. Unfortunately, differences between the House and Senate bills prevented this provision from becoming law. Do you agree that natural gas could be used extensively as a transportation fuel, and that it is important to reform tax policies that discriminate against the use of natural gas?*

   Answer: Senator Toomey, I once sponsored a similar proposal that equalized the fuel tax rate on propane gas on a BTU basis. I commend you and the Committee leaders for advancing this common-sense proposal that would level the playing field for LNG.

Questions from Senator Mark Warner

1. *You discussed your position on the Wind PTC and how you think it should be addressed in a reform process. I'm curious as to what role you think other renewable incentives might play in the process, like the Solar Investment Tax Credit?*

   Answer: Senator Warner, as stated in my testimony, I would recommend that tax reform treat energy companies and their products the same as all other companies – no subsidies and no penalties. Any tax reform will certainly require a substantial transition period, and it may be appropriate to consider how to transition out of some of the existing subsidy regimes.

2. *If you support an "all of the above" approach to energy policy, as I do, you want to ensure all of the eggs in our energy basket have an opportunity to grow. Whether it's a continuation of the benefits on hybrid and electric vehicles, a continuation of the Solar ITC (investment tax credit), or putting back into place modified residential energy retrofits (as I recommended with 25(c) in the EXPIRE Act). But I also know that getting to comprehensive tax reform will require give and take on both sides. My question is can you do all of this and reduce the overall tax rate? Where would the money come from?*

   Answer: Senator Warner, I work with several of the largest companies in the world in a variety of industries including energy, retail, communications, financial services, and healthcare. All of them recognize the economic benefits that would occur with comprehensive tax reform that lowers the rate and adopts a territorial system of international taxation. All of them have likewise acknowledged that reform would entail some degree of sacrifice related to their existing tax situation. The devil as you know is in the details; however I believe that with sufficient leadership from Congress and the Administration the job can be accomplished.

3. *In addition to providing certainty, it's also important to look at how we measure volatility with this. We certainty want to incentivize certainty and price signals will motivate those in industry. How can using the tax code to do an all of the above approach to energy policy, reduce price volatility?*

   Answer: Senator Warner, permanent tax policy that the energy industry and all other domestic industries can rely upon for planning and investment decisions is essential. Commodity prices experience volatility for a variety of reasons, but you should endeavor to ensure that temporary tax policy is not one of those reasons. As previously stated, I would prefer permanent tax policy that treats energy companies and their products the same as all other companies.

Wyden Hearing Statement on the Future of American Energy Policy

Around the world, countries driven by tough global competition, dramatic demographic shifts, climate change, and an investment boom in clean tech are ripping up the 20th century energy playbook and laying out new paths forward. The United States – with a penchant for innovation and entrepreneurship – can lead the way.

In order to lead, our challenge is to guarantee that outdated energy policies aren't pulling America back into the pack. And on our watch, leading the pack on energy – and striving for American energy exceptionalism – means leading the pack on tax reform. Here are a few examples of what leadership will look like.

For the first time, the tax code must take the costs and benefits of energy sources into account. This committee is going to have a robust conversation about how best to determine costs and benefits. I believe the list of factors must include considerations that don't always figure in today, such as energy efficiency, affordability, pollution, and sustainability.

Second, it's past time to replace today's crazy quilt of more than 40 energy tax incentives with a modern, technology-neutral approach. Let's clear the hurdles that slow down America's energy innovators and let's introduce a new level of competition and fairness into the marketplace.

Third, the disparity in how the tax code treats energy sources – and the uncertainty it causes – has to end. Traditional sources benefit from tax incentives that are permanently baked into law. But clean energy sources are stuck with stop-and-go incentives that have to be renewed every few years.

Congress has developed a familiar pattern of passing temporary extensions of those incentives, shaking hands, and heading home. But short-term extensions cannot put renewables on the same footing as the other energy sources in America's competitive marketplace.

Clean energy projects take time to plan and finance. The facilities and machinery take years to get up and running – especially in sources like hydropower, geothermal, and biomass. Predictable, level-playing-field tax policies could clear the way for America's clean energy sector to thrive at home and outmatch global competitors hungrily eyeing the multi-trillion dollar market for energy goods and services.

It's important to recognize that better tax policy alone will not solve America's energy needs. Energy tax reform must be part of an overall strategy that moves the country toward a clean energy future. That cohesive, overall strategy for American energy is what's lacking today.

That has to change. I see energy tax reform as a way for the Finance Committee to work on a bipartisan basis to drive America's energy policy toward a modern level-playing field approach. Today's hearing is an opportunity for the committee to begin to map out the road ahead.

###

Testimony before the US Senate Committee on Finance
Ethan Zindler
Head of Policy Analysis
Bloomberg New Energy Finance
September 17, 2014

Good morning. Thank you, Chairman Wyden, Senator Hatch and the committee staff for this privilege. It truly is an honor to participate in this important discussion.

I join you today in my role as an analyst with Bloomberg New Energy Finance (BNEF), a market research division of Bloomberg LP focused on the transitions underway in the global energy markets. Our firm's clients include financiers, energy equipment makers, independent power producers, utilities, oil majors, NGOs and government agencies in over 50 nations.

My remarks today represent my views alone, not the corporate positions of either Bloomberg LP or BNEF. I invite the committee members to review the accompanying slides I have submitted as I read my remarks.

I will focus my comments today on how the two largest US non-hydro renewables sectors – wind and solar – are impacted by their respective tax credits. I recognize there are a number of intriguing ideas on how to reform the tax code more holistically as it pertains to energy, including the Baucus white paper from last year. I look forward to discussing these during the Q & A.

Let me start with two basic assertions. First, the energy sector is in the midst of a fundamental transformation. How we produce, deliver, consume and even think about energy are all changing rapidly and, I would argue, irreversibly.

And second, these trends, which began in the past decade and picked up steam in the past five years, are going to continue over the next two decades.

This is inevitable, thanks to incredible advancements in natural gas extraction, declines in solar module prices, improvements in wind turbine technology, and greater connectivity and "intelligence" of electricity-consuming devices and of the grid itself, to name but four changes.

Since 1992, the Production Tax Credit has played a vital role in subsidizing and spurring the construction of US wind projects. The PTC's current $23 per megawatt-hour benefit coupled with accelerated depreciation benefits has allowed wind capacity to grow nearly nine-fold since 2005.

The PTC's importance has been illustrated each time Congress has allowed it to expire without a quick retroactive reinstatement. Each time, installations have fallen sharply. The steepest of these declines came between 2012 and 2013 (SLIDE 1). In fact, last year was the industry's worst since 2004.

Today, the PTC remains officially off the books meaning that new, greenfield projects generally don't qualify for the benefit. However, due to a critical change contained in the 2013 Taxpayer Relief Act the credit continues to have important market impact. That change effectively allows most projects that began but did not complete construction before the credit sunset to still qualify.

The adjustment has helped to sustain the wind industry this year and will continue into 2015. In all, we anticipate 15 gigawatts new capacity will be installed in the US in 2014 and 2015 marking a significant rebound from last year when just 1 gigawatt was installed.

What happens in 2016 if Congress does not extend the credit? In our view, the market will as it has in the past experience a sharp decline in activity, potentially

resulting in layoffs for manufacturers with operations on US soil.

A somewhat similar cliff now looms for the solar sector, which enjoys the benefit of the Investment Tax Credit (ITC) allowing developers to receive a credit equal to 30% of their project's capital expenditures. The ITC is now due to sunset at the end of 2016. At that time, when the ITC "steps down" to 10% of capex, we anticipate a drop in solar installations similar to what we have historically witnessed with wind (SLIDE 2).

One option that has been proposed for the ITC is to adopt the same "placed in service" language associated currently with the PTC. Such a move could have the same positive impact on the solar market as it has on wind, in our view (SLIDE 3).

Critics charge that these tax credits provide little motivation for these nascent sectors to improve their economics and become price-competitive. But recent evidence suggests the wind and solar industries are rapidly reducing costs, in large part to compete with natural gas-fired generation.

In the case of solar, the cost of a photovoltaic panel today is $0.50/Watt, compared to over $3.00/Watt as recently as 2008. This has created areas in the US where "socket parity" exists for new solar installations -- i.e. the cost to the home or business owner is lower than buying from the grid when subsidies are taken into account.

In the case of large-scale solar projects, we have seen the prices associated with power contracts rapidly decline in the last few years (SLIDE 4). The main reason for the price declines: simple economies of scale as the PV industry has grown 10-fold in just the past five years.

Similarly, wind generation costs have dropped in recent years, though in this

case the reasons have more to do with technological advancements. Superior, utility-scale turbines employing longer blades and other improvements are achieving unprecedented capacity factors. In certain parts of the world, wind is the single lowest-cost source of power generation.

And further improvements are coming. These technologies will not stop evolving – and their costs will not stop declining. For this reason, we project that wind and solar will ultimately account for at least 20% of all capacity in the US by 2030 (SLIDE 5). This may sound ambitious, but on a generation basis (actual megawatt-hours generated), we anticipate that coal, gas, and nuclear will still meet the large majority of demand by 2030 (SLIDE 6). And no, our long-term forecasts do not assume these key tax credits get extended.

In closing, I would just reiterate my two basic points: (1) major changes in the energy sector are upon us and (2) these will continue through 2030 as the trends set in motion of recent years continue.

Thus the question becomes what role will the US play in this revolution? Will the US market follow a smooth or rocky path toward clean energy deployment? Will the US be a market maker or price taker? Will the US primarily be a clean energy equipment exporter or importer?

Inconsistent and unpredictable short-term policy-making will not fundamentally undermine the long-term changes underway in the energy sector worldwide. These are now inevitable thanks to technological innovation, economies of scale, and yes, policy support coming from many nations around the globe, including most notably, China.

But inconsistent policy-making can impact the role the US plays in this change.

Thus the decisions Congress takes on certain aspects of the tax code today could have far-reaching implications for US competitiveness tomorrow.

Once again, I thank the committee for this opportunity. I look forward to your questions.

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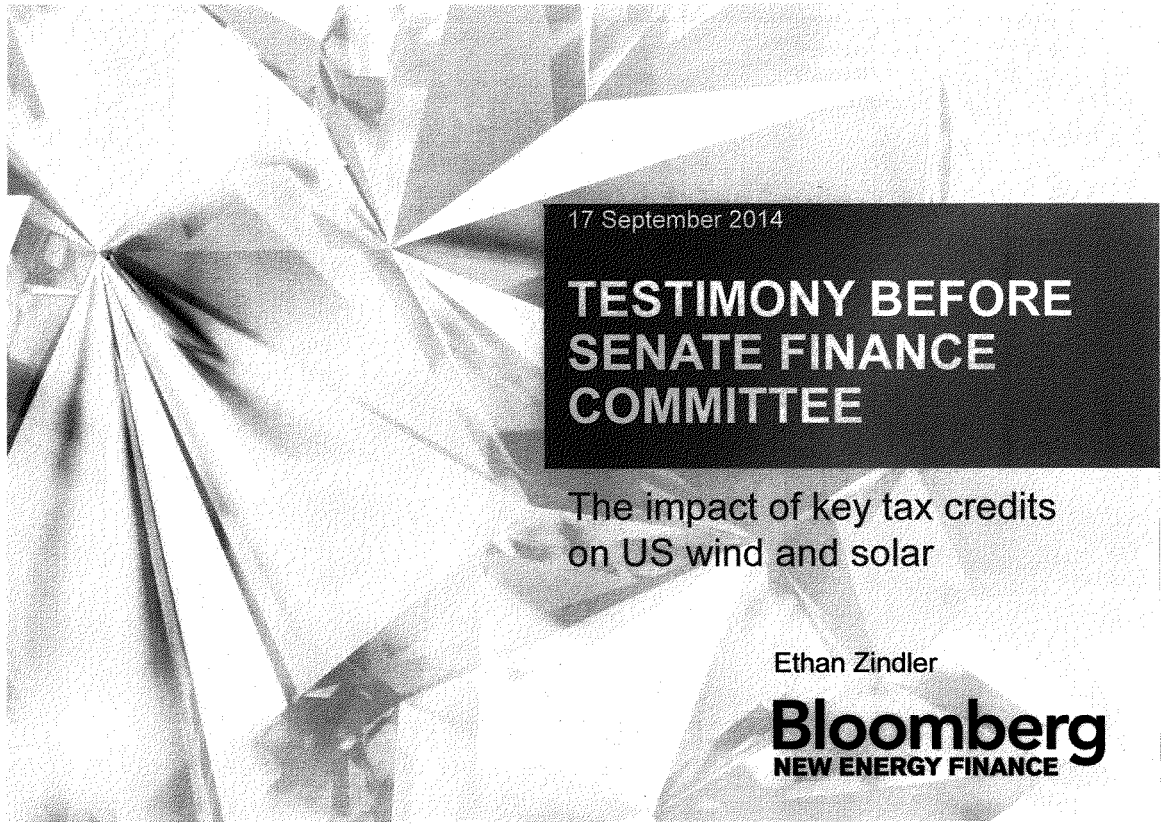


17 September 2014

TESTIMONY BEFORE SENATE FINANCE COMMITTEE

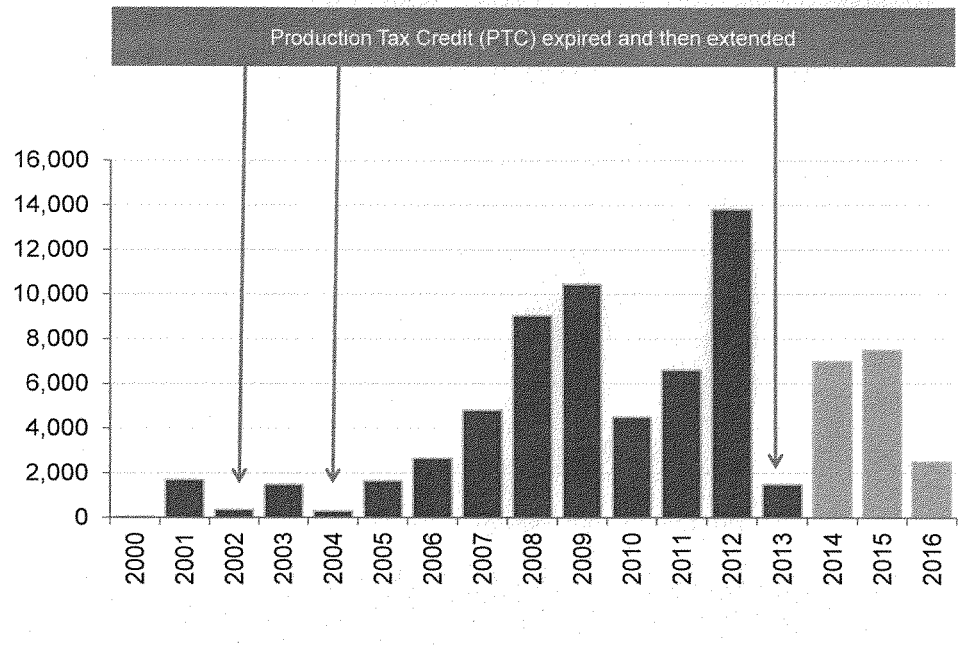
The impact of key tax credits on US wind and solar

Ethan Zindler

Bloomberg
NEW ENERGY FINANCE

US ANNUAL WIND BUILD, 2000-2013 AND 2014-2016 FORECAST (MEGAWATTS)

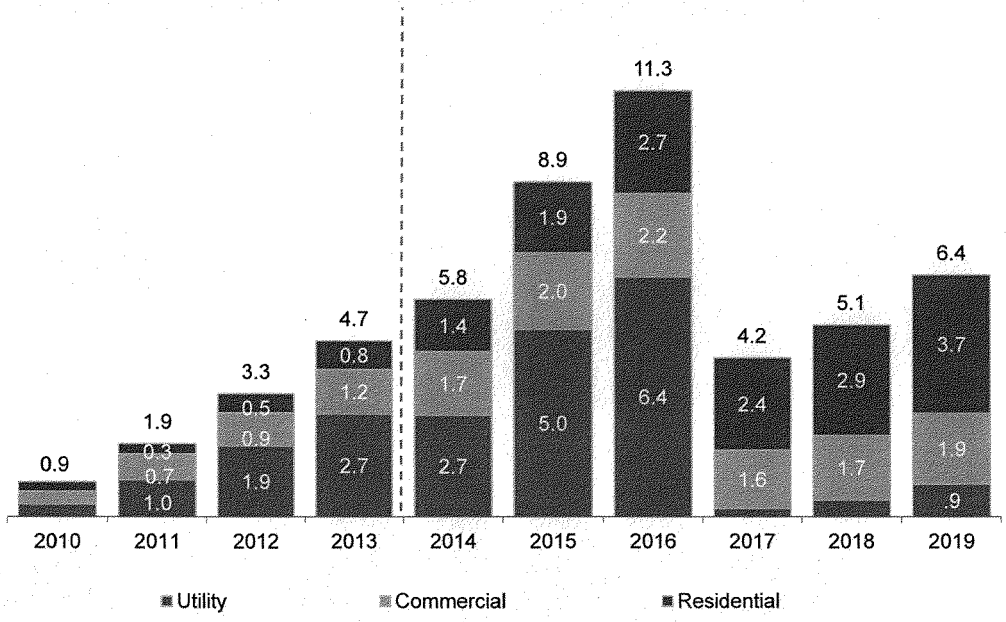
Bloomberg NEW ENERGY FINANCE



Source: Bloomberg New Energy Finance

US PHOTOVOLTAIC BUILD, ASSUMING INVESTMENT TAX CREDIT STEP DOWN TO 10% IN 2016 (GIGAWATTS)

Bloomberg NEW ENERGY FINANCE



Source: Bloomberg New Energy Finance

US PHOTOVOLTAIC BUILD WITH ITC 'BEGIN CONSTRUCTION' RULE CHANGE (GIGAWATTS)

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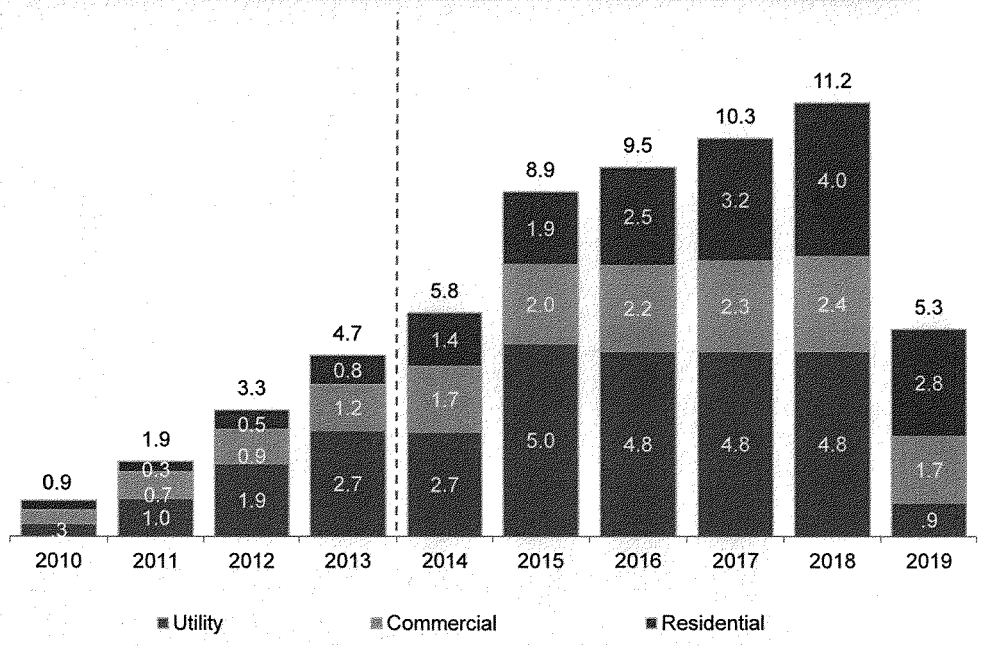
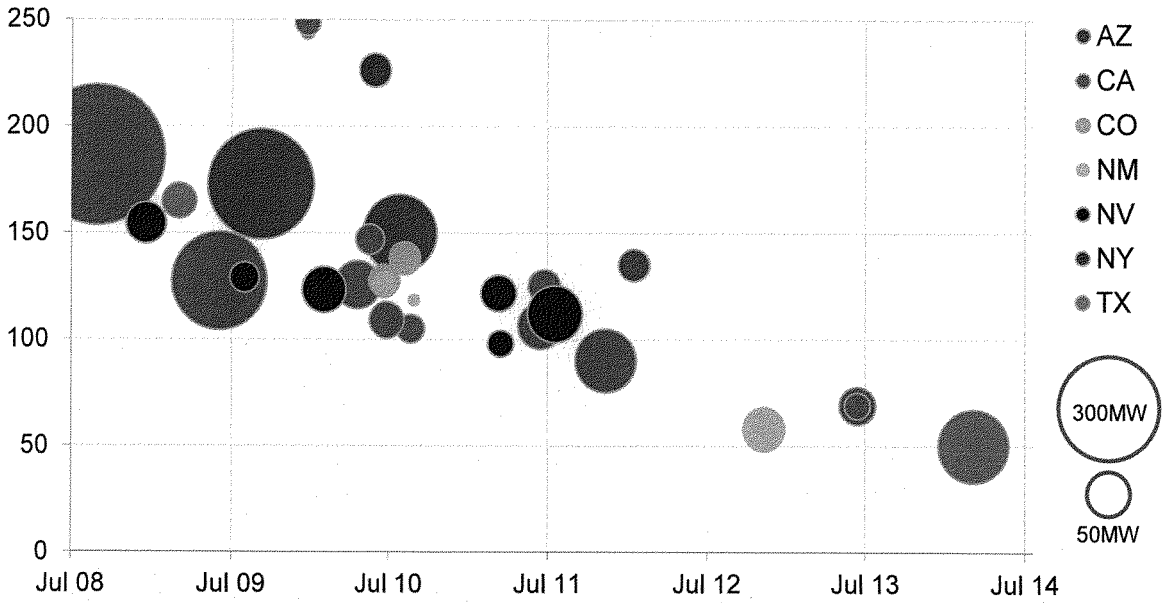


Source: Bloomberg New Energy Finance

US SOLAR POWER PURCHASE AGREEMENT PRICES BY SIGNING DATE, H2 2008 – H1 2014 ($/MEGAWATT HOUR)

Bloomberg NEW ENERGY FINANCE



Note: Does not include PPAs under 5MW. 'PPA price' is calculated as the average offtake price over the period of project operation. Topaz PPA price estimate based on first-year total PPA revenues ($198.8m)

Source: Bloomberg New Energy Finance, FERC

US FORECAST CUMULATIVE INSTALLED POWER GENERATING CAPACITY BY TECHNOLOGY (GIGAWATTS)

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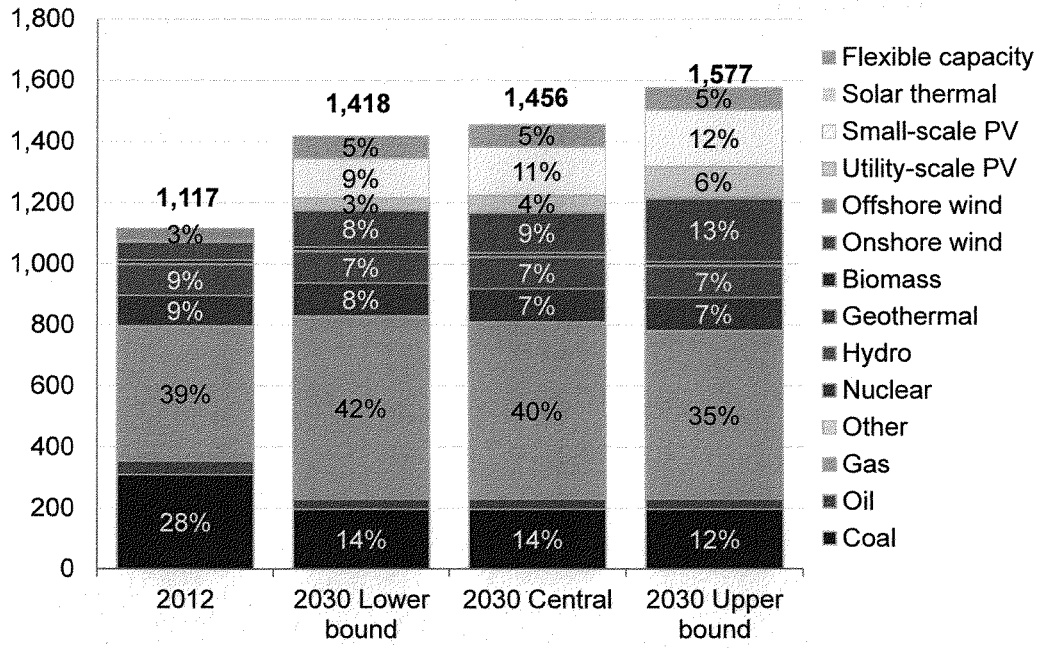

Source: Bloomberg New Energy Finance 2030 Market Outlook

US FORECAST POWER GENERATION BY TECHNOLOGY, 2012-30 (TERAWATT HOURS)

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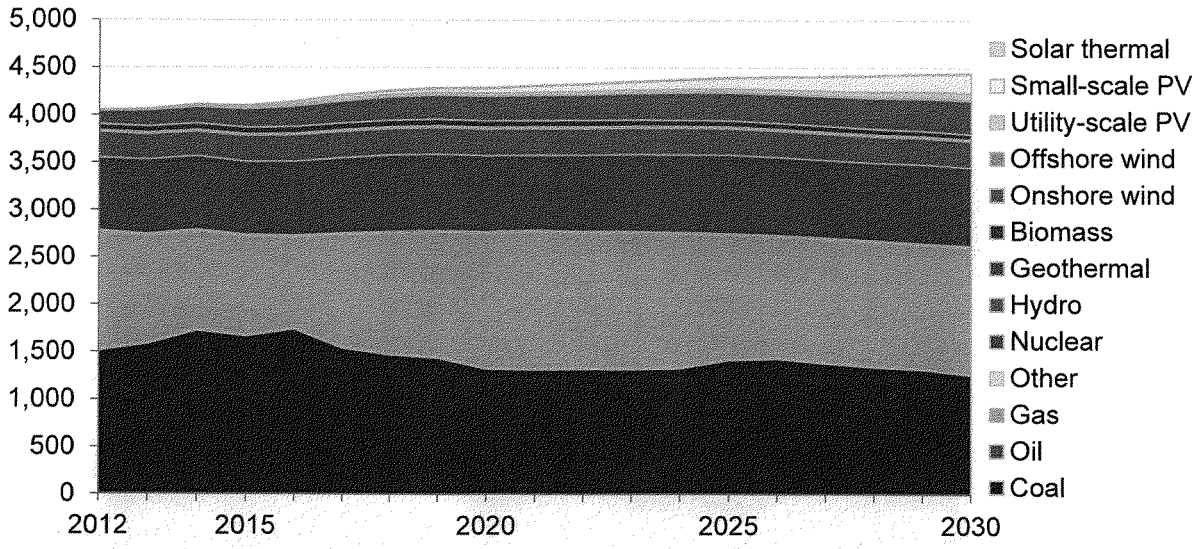

Source: Bloomberg New Energy Finance 2030 Market Outlook

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NEW ENERGY FINANCE

20 January 2010 US Policy - Research Note

Contents

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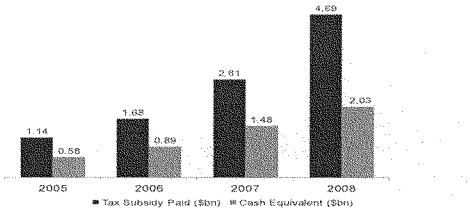
Cash is king: shortcomings of US tax credits in subsidising renewables

Executive Summary

For over a decade, US clean energy sector growth has relied heavily on federal tax subsidies. The Production Tax Credit and its sister Investment Tax Credit have been critical to developing wind, solar, and other renewable power projects. On occasions when these policies have lapsed, the US market has suffered dearly. But just how efficiently do these subsidies put taxpayer resources to work? Could cash deployed in place of the credits have greater impact? At the request of the bipartisan National Commission on Energy Policy in Washington, Bloomberg New Energy Finance recently examined these questions. Key findings:

- Deploying cash offers the federal government a substantially higher return on its "investment" in the sector. From 2005-08, the US installed nearly 19GW of new wind capacity, incurring a liability to the federal government of approximately $10.3bn in tax credits (net present value).
- The government could have achieved approximately the same result in terms of new capacity additions by deploying $5bn in cash grants directly at the time of a project's commissioning. One dollar in cash has, on average, gone twice as far as one dollar of tax credits in subsidising wind. This is partly due to the relatively small number of "tax equity investors" to exploit the credits.
- Whether the gap between cash and tax credit will remain as large in the future remains an open question dictated by a variety of factors. However, under most plausible short-term scenarios, cash offers US taxpayers a better bang for their buck in spurring new clean energy development than the PTC. The one notable exception would be if wholesale electricity prices decline dramatically and remain low for a sustained period.

Figure 1: Total federal government cost of subsidising US wind with tax credits vs. assumed substitute cost of using cash grants, $bn



Source: Bloomberg New Energy Finance. Note: Contains numerous assumptions about capacity factors, power

prices, debt/equity ratios, tax equity yields, and debt yields. See explanation below

1. A brief history of tax credit financing for US renewables

1.1. The old PTC boom-bust cycle

Established by the 1992 Energy Policy Act, the Production Tax Credit offers owners of clean energy projects tax credits pegged directly to production. Today, for each MWh of electricity a wind project generates, the project's owner receives a $21 tax credit, which can be applied directly to his tax bill. The incentive is production-based – i.e. the more hours a project produces power, the more dollars in tax credits it generates. The tax credits pay out for the first 10 years of a project's existence and the $21/MWh benefit rises over time at the rate of inflation.

In the past, the credits could not easily be put to use by developers themselves due to the developers' small size, lack of profitability and, in turn, lack of tax exposure. Thus, third-party "tax equity providers" invested in clean energy projects and took their pay-outs in the form of the credits, rather than cash. Other investors, typically including the project developers themselves, received whatever cash flows were generated by the wind farm.

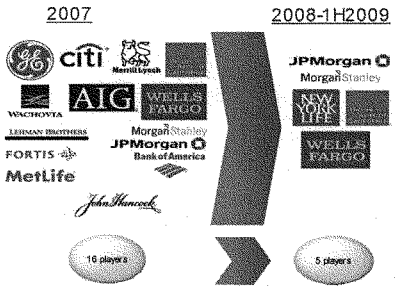
A small, specialised pool of tax equity investors developed, led by JP Morgan Chase and GE Capital. These institutions played a critical role in building the clean energy sector by taking advantage of the PTC's benefits and the benefit of a separate tax-related subsidy, the Modified Accelerated Cost Recovery System (MACRS), which allows developers to depreciate the value of their projects on a five-year timetable.

Since 1999, the PTC has been allowed to lapse by Congress on three separate occasions without being immediately extended. Each lapse resulted in a precipitous drop in wind installations. In 1999, 659MW of new wind went into the ground, according to American Wind Energy Association data. That fell to just 67MW in 2000. Similar drops occurred 2001/2002 and 2003/2004. The PTC is now on the books through 2012 (the ITC is in effect through 2016).

1.2. The new PTC boom-bust cycle

By summer 2008, a new and unprecedented PTC problem emerged, related not to Washington but to Wall Street. Financial institutions suddenly found themselves strapped for cash due to the dramatic downturn in the housing market. With most banks posting losses and future profitability in doubt, few were interested in an investment that would only pay out if they had significant tax liabilities for the next 10 years. Tax equity capital became sparse and the so-called "tax equity yields" (returns on investment expected by providers and effectively the cost to the borrower) jumped from 6-6.5% to 9% or higher. The number of players providing capital shrank dramatically as well. As the financial crisis deepened in fall 2008, tax equity capital dried up completely as financial institutions, in essence, lost confidence in their own profitability and, in turn, in their own use of tax credits to offset tax exposure.

Figure 2: Active players in US tax equity investing, 2008-1H2009

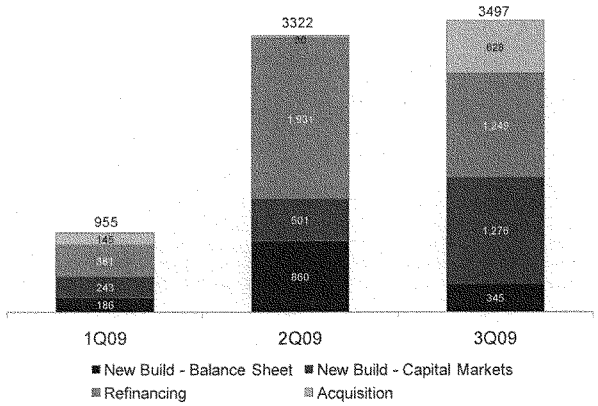


Source: Bloomberg New Energy Finance

The result of this sudden change was almost immediately apparent in the field, where new construction ground to a halt. Back in Washington, the same clean energy advocates that had pushed for extensions of the tax credits returned to Capitol Hill with a new goal of "fixing the PTC".

Those efforts paid dividends and in February 2009, President Obama signed into law the American Recovery and Reinvestment Act establishing a new grant programme to be administered by the Department of Treasury with assistance from the Department of Energy. In essence, the programme allows developers to receive cash grants from the federal government equal to 30% of their project's capex, if they agree to forego the benefits of either the PTC or ITC. Rules regarding implementation were promulgated by Treasury in July and the first grants were issued in September. The new grant programme has breathed life into the US project finance market and helped revive asset finance activity, spurring over $1bn in capital market activity in the wind sector alone.

Figure 3: 2009 Project financing for US wind, $m



Source: Bloomberg New Energy Finance Intelligence service

2. Cash or (tax) credit?

The sudden challenges confronting the tax credit subsidy system, coupled with the new clean energy-friendly Obama administration, has prompted some to ask if a new, superior federal policy can be crafted to support renewables in place of the PTC/ITC. Among those contemplating the alternatives is the National Commission on Energy Policy, a bipartisan group of 20 of the nation's leading energy experts, which regularly advises Congress and other key policymakers in Washington.

In November 2009, NCEP contacted Bloomberg New Energy Finance and asked that we examine a much narrower question: *how efficient is the PTC in leveraging private sector investment and spurring clean energy development? What would an equivalent subsidy cost the government if the aid was disbursed in cash, rather than via tax credits?*

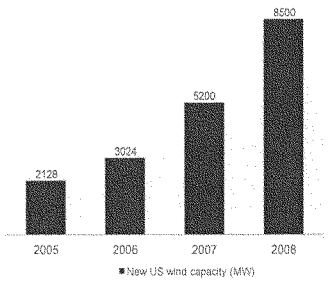
This latter question has become particularly relevant since the advent of the Treasury grant programme, which starts to sunset at the end 2010. Already, clean energy industry advocates are pushing for the grant's extension for a year or two longer. Bloomberg New Energy Finance offers no specific opinions here on that matter, and the findings in this paper should not be construed as an endorsement or denouncement of that policy.

2.1. The cost of the PTC

To determine the relative effectiveness of the PTC, Bloomberg New Energy Finance focused on wind project capacity additions in 2005-08 when the tax credits and the tax-related MACRS played key roles in spurring development. Exploited completely, these two subsidies eliminate well over half of a typical developer's capex.

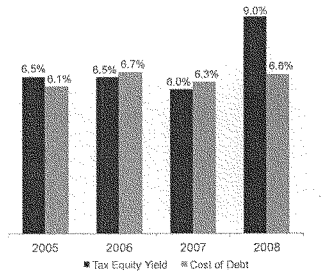
The wind sector enjoyed unprecedented growth over this period with installed capacity rising from 6.7GW at the end of 2004 to 26.4GW by end of 2008.

Figure 4: Wind capacity additions, 2004-08, MW



Source: Bloomberg New Energy Finance Intelligence service

Figure 5: Estimated tax and project finance yields



Source: Bloomberg New Energy Finance Wind Insight service. Note: Tax equity yields and cost of debt differ in that one represents a before-tax cost of capital while the other represents an after-tax cost.

To determine the cost to the federal government of the PTC in a given year, Bloomberg New Energy Finance took the total number of MW of new wind capacity installed, then projected out the number of MWhs that would be generated over a 10-year period, assuming an overall 33% capacity factor. This total was then multiplied by the value of the PTC, to determine the government's tax credits liability. The year-on-year growth in the cost of the PTC to the government rose in near direct proportion to the rate at which new capacity was added. In 2005, the government incurred an approximate tax credit liability of $1.1bn as 2.1GW of new wind was added to the grid. In 2008, the liability rose to $4.7bn on 8.5GW of new installs. In all, over the four-year period, the government incurred a total liability of approximately $10.3bn on 18.9GW of new wind capacity.

2.2. "PTC Ridge" vs. "Debt Valley"

Bloomberg New Energy Finance then sought to estimate how much it might have cost the federal government to subsidise the exact same number of new MW of wind with a simple cash grant subsidy that paid out at a project's commissioning, rather than over time.

This could not be a simplified calculation, for two reasons. First, the project finance structure for a typical wind farm changes dramatically when a cash subsidy is introduced and this has important implications for the project's overall cost of capital. Under a typical PTC finance structure, the tax credit equity investment effectively serves as a proxy for debt capital with the developer making fixed payments at certain yield rates each year to the tax equity provider through the first 10 years of the project's life. When a cash grant is part of the equation, the developer simply borrows from a lender and repays the debt in cash.

Second, the cost of capital for tax equity is different than the cost of capital for straight project debt. As shown in Figure 5, these costs can vary from year to year, sometimes substantially.

In an attempt to create the most relevant analysis, Bloomberg New Energy Finance created financial models for two typical but hypothetical 100MW nameplate capacity wind farms: "PTC Ridge" which exploits all available tax benefits (PTC and the MACRS five-year depreciation) and relies on a combination of tax equity and regular equity for funding; and "Debt Valley", which exploits no tax benefits whatsoever and relies on a combination of straight debt and regular equity.

Table 1: PTC Ridge and Debt Valley compared

	PTC Ridge	Debt Valley
Nameplate capacity	100MW	100MW
Federal subsidy	Tax credits	Cash equivalent
Assumed capacity factor	33%	33%
Electricity price	$75/MWh	$75/MWh
Tax equity or debt as % of overall capex	60% tax equity	75% debt
Back-leveraged?	Yes	No
Cost of tax equity / debt	Variable -- See Figure 5	

Source: Bloomberg New Energy Finance. Note: Back-leverage indicates that developer takes out debt secured only against his claim to the cashflows to finance his cash equity investment in the project.

In a typical PTC-structured project, tax equity capital represents 60% of capex with regular cash equity making up the balance. By contrast, a project such as Debt Valley receiving an up-front cash grant can lever up much further. For the sake of this analysis, New Energy Finance assumes a cash-funded project can cover 75% of its capex with debt.

In addition, the cost of these two kinds of capital differs. As shown in Figure 5, tax equity yields demanded by providers ranged between 6% and 6.5% until 2008 when they spiked to 9%, or even higher. It is important to note that the wind project finance market is quite opaque with actual terms of tax equity financings very rarely disclosed. Bloomberg New Energy Finance bases this estimate on its numerous conversations with players within the industry over the relevant years.

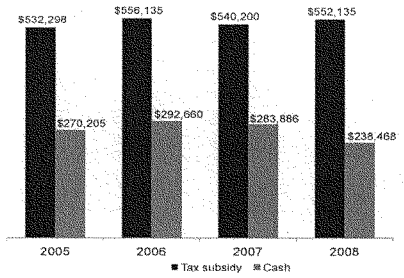
The cost of straight debt for wind projects also varied over those years, but somewhat less dramatically. Because there were few major wind projects financed with straight debt in the US during those years, Bloomberg New Energy Finance has used assumptions based on the cost of capital in the European Union where such financings are common.

2.3. Matching NPVs

We then examined the internal rate of return earned by a straight equity investor in PTC Ridge, given all of the assumptions outlined above. In real market conditions, that same investor would have to earn the same return on Debt Valley to consider backing that project. So we asked a simple question: *How much government cash would have to be provided to Debt Valley in lieu of the tax credits to allow that investor to earn the same return?*

While results varied from year to year somewhat, the basic finding remained the same: substantially less cash was needed than tax credits to provide the equivalent subsidy to the same 100MW wind farm. From those results, we were able to extrapolate the cost to the government of subsidising 1MW of new capacity with tax credits vs. the theoretical cost of a cash subsidy in years 2004-08.

Figure 6: Projected cost to the federal government of adding 1MW new wind capacity



Source: Bloomberg New Energy Finance PTC Ridge vs. Debt Valley financial model. Note: Tax subsidy includes both PTC and MACRS. Cash figures are estimates.

PTC Ridge and Debt Valley were both intentionally structured to be as typical as possible of US wind farms. Thus, the results from these two projects can be used to generate an overall cost comparison analysis. As shown in Figure 1, the federal government could, theoretically at least, have saved between $560m (in 2004) and $2.66bn (in 2008) had a cash grant subsidy been in place rather than a tax subsidy.

One minor caveat: our PTC Ridge model assumes maximum efficiency in its use of tax credits. In reality, some percentage of the credits generated by projects over a 10-year span may not get put to use by the tax equity investor for various reasons. However, even assuming 20% of all tax credits are left unused, a substantial gap still remains between the efficiency of the PTC and cash grants.

3. Implications for future costs

As discussed above, the two financial models built by Bloomberg New Energy Finance to compare the efficiency of the PTC vs. straight cash support from the federal government contain numerous realistic inputs and assumptions based on real-world conditions from 2004 to 2008. Looking ahead, virtually all of these are subject to change, making predicting the future efficiency of credits a challenge. While cash would have been roughly twice as efficient as tax credits in subsidising wind over the past four years, on average, there is no certainty that that gap will remain as large in coming years. That said, Bloomberg New Energy Finance believes there is only one somewhat realistically possible short-term future scenario under which the PTC becomes a better deal for taxpayers.

3.1. Sensitivities

While any number of inputs are critical to determining the cost of capital of a given wind project, adjusting most of them in the Bloomberg New Energy Finance PTC Ridge vs. Debt Valley model has surprisingly little impact on our overall findings about the efficiency of the PTC vs. cash.

Inputs almost certain to change on a look-ahead basis include the costs of tax equity capital vs. debt. As discussed above, estimated tax equity yields demanded by project financiers ranged from 6% to 9% from 2004-08 while the projected potential cost of debt ranged from 6.1% to 6.7%. The comparative efficiency of the PTC vs. cash widened and narrowed year to year (Figure 6). The gap was narrowest in 2006 and 2007 when cash would have been 1.9 times as efficient for the federal government as the PTC. It was widest in 2008 when cash would have been 2.3 as effective as tax credits.

It should be noted that 2008 was clearly an exceptional year in which capital did not merely become constrained but the very viability of the entire financial system came into question. This created an unusually large 9% to 6.6% contrast between the cost of tax equity and the projected cost of debt for US wind projects. Even under these extreme conditions, however, the underlying difference in the efficiency of the PTC vs. cash was not dramatically larger than in more the more "normal" years of 2005-07.

Similarly, adjusting projected demanded yields for tax credits and debt in future years makes only a relatively minor impact on the amount of federal cash that would be needed to replace the PTC effectively. Bloomberg New Energy Finance projects the US will install roughly 8-10GW of new wind capacity in 2010 resulting in an overall capex of $15-$19bn (assuming roughly $1.9m/MW). Assuming tax equity and debt costs that are roughly equivalent and a power price of $75/MWh, the federal government would assume a tax credit liability on these projects of $4.3-$5.4bn, on a net present value basis, if all were to be financed with the PTC and MACRS. The equivalent subsidy could be disbursed in cash for $2.3-$2.8bn in cash.

(It should be noted that in reality nearly all new wind projects installed in 2010 will not be financed with the PTC. Instead, they will benefit from the Treasury Department's grant-in-lieu-of-credits programme, which for wind projects alone will cost the federal government $4.5-$5.6bn in 2010. The government will incur a further liability on these projects due to the MACRS accelerated depreciation that these projects will exploit as well.)

3.2. Natural gas, power prices, and implications for federal subsidies

The one factor that could have a major impact on the cost of a properly priced PTC replacement relates to the price at which electricity can be sold from US wind projects. In our base case scenarios for both PTC Ridge and Debt Valley, we assumed all power from either project would be sold for a flat $75/MWh over 10 years of either project's life. This was a relatively reasonable assumption, given the long-term power purchase agreements wind projects have signed with utilities in recent years.

Looking ahead, there is considerable uncertainty about the price at which wind power can be sold, however. The recent economic downturn, coupled with a glut of domestic natural gas, is putting

downward pressure on wholesale electricity prices overall. The trend has the potential to depress wind power prices in particular and would mean the federal government having to provide more generous cash supports to match the PTC.

As illustrated in Figure 7 below, electricity sold from Debt Valley at $90 requires a federal cash subsidy of $240,000 per installed MW to match the benefit of the higher cost PTC. If the electricity price drops to $75, the required cash subsidy rises to $280,000 per MW. If the price falls to $60, the projected cost rises to $440,000.

Still, under all three such scenarios, the price of the cash subsidy is less than the approximately $0.55m/MW cost of the PTC. It is not until electricity prices fall to $54/MWh that the cash subsidy becomes equivalent to the cost of the PTC. In short, only if the US faces a period of substantially lower wholesale power prices does the PTC offer a better a return on investment for the federal government.

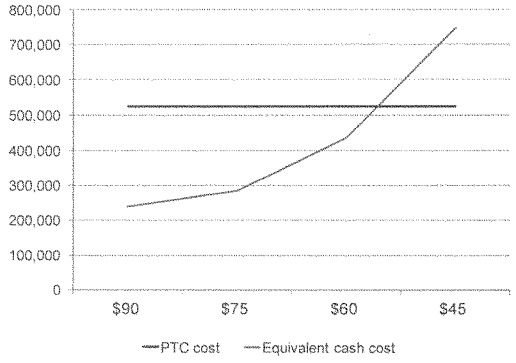
It is worth recalling here that the point of the PTC Ridge vs. Debt Valley model comparison discussed was solely to evaluate how much cash would be needed to replicate the value of the PTC under real world conditions where investors expect certain rates of return. It was not to assess the current grant programme which offers a pay-out equal to 30% of a project's capex.

Given that, there is a relatively straightforward reason why more government cash would be needed to match the value of the PTC if natural gas and, in turn, electricity prices were to fall. The PTC (and the other tax benefit, MACRS) essentially represents the fixed part of a project's value since the tax credits are pegged at $21/MWh and rise with inflation. Cash from electricity sales represents the variable part of a project's value. As a result, if those cash flows diminish, the tax benefits become a larger percentage of the project's overall value.

From the investor's perspective, a project has to offer a justifiable rate of return. Thus, if the cash flows from electricity sales are lower, the benefit offered by the government has to be higher to compensate and to offer the same attractive return the project would have had in a higher priced environment.

Figure 7: Federal cash subsidy required to match PTC impact at various wholesale electricity prices

$/MW



Source: Bloomberg New Energy Finance. Note: The above reflects the amount of federal cash subsidy required to replicate the impact of the PTC for a typical wind project selling its power at $90, $75, $60, or $45 per MWh. Assumes power sales contracts are long-term with consistent pricing over a 10-year period. Assumes PTC costs, tax equity yield, and debt yields from 2007.

One last important caveat: The sensitivity analysis above does not take into account the potential impact state-level renewable portfolio standards can have on the economics of specific wind projects.

These RPS generally allow clean energy projects to sell not just the power they generate but also the associated clean energy attributes, typically monetised in the form of renewable energy credits (RECs). Bloomberg New Energy Finance believes that if electricity prices drop dramatically in coming months and years, operators of wind farms will be able to make up for some significant portion of that shortfall via higher priced REC sales agreements.

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Questions for the Record
Senate Finance Committee
"Reforming America's Outdated Energy Tax Code"
Hearing Date: September 17, 2014
Questions for Mr. Ethan Zindler

Question from Chairman Ron Wyden

1. *Many clean energy companies don't have enough tax liability to take full advantage of current incentives like the Wind PTC, so they pursue tax equity financing, which leads to higher financing costs and higher overall costs for the project. Can you quantify how much of the 2.3 cent production tax credit is lost to tax equity financing costs? What are the options to improve the efficiency of these tax incentives?*

Answer: This is a very good question and unfortunately there truly is no straightforward way to quantify the "PTC premium" over typical project debt costs, per se. Still, there is little doubt that securing financing for a US wind project in the US is usually a more costly endeavor than doing so in Europe where tax equity is not part of the wind project financing equation. In Europe, projects are typically financed with a simple combination of project debt and equity, just as other non- clean energy infrastructure projects are financed in the US.

In 2010, Bloomberg New Energy Finance was commissioned by the National Commission on Energy Policy of the Bipartisan Policy Center to examine a variation of this question in some detail. I am attaching the resulting white paper, "Cash is king: shortcomings of US tax credits in subsidizing renewables" here for the committee's review. At the time, Congress was considering replacing the wind Production Tax Credit with a cash grant system instead. (Ultimately, a temporary cash grant program was approved by Congress under the American Recovery and Reinvestment Act of 2009).

While the analysis in that paper is somewhat dated, its main conclusion still holds: "deploying cash offers the federal government a higher return on its 'investment' in the [renewables] sector."

Specifically, we found that the PTC cost US taxpayers $4.7bn in 2008, but the US could have subsidized an equivalent volume of wind capacity build that year at a cost of $2bn if it had simply made cash grants available instead of credits. This approximately $2.7bn gap between the cash and tax credit cost represents the effective premium the government paid at the time for employing tax credits.

That analysis comes with a few key caveats, however. First, 2008 was a particularly costly year to access tax equity as the financial crisis was taking hold. Second, this represented the gap between relatively high-priced tax equity capital for wind projects and essentially "free" (interest-free) cash grants. In reality, interest-free loans are not available to developers in virtually any market. Thus the real question is the gap between the "tax equity yield" and the interest rate offered on a typical wind project loan. Again, there is really no simple way to make this comparison as the way in which a European project gets financed is structured in an entirely different manner than in the US.

Question from Senator Orrin Hatch

1. *This question is for the whole panel, starting with Senator Nickles and Doctor Kreutzer. There have been several energy tax provisions that many consider government spending through the tax code. These provisions have taken the form of grants or refundable tax credits.*

   I am curious if you believe that the tax code is an appropriate place for government outlays and if we should include any energy tax provisions that result in outlays in tax reform?

   Answer: Historically, the tax code has played an important role in spurring certain kinds of activities in the energy sector, dating back over a century. Clearly, tax policy can influence private sector activity, particularly by encouraging investors to be less risk averse and take greater chances on new technologies.

   I have little doubt that the tax code can continue to play a similar role going forward. The questions for policymakers then are: what types of technologies should be supported? Those at the earliest stage of development (i.e. still in the lab)? Those that have been deployed but only at small scale? Those that are now widely deployed? And what about CO2 emissions? Should only zero-emitting sources be supported or can those which simply emit less than conventional sources be subsidized as well?

   Elsewhere around the globe we have seen clean energy technologies supported through a wide number of policy supports. These include: "feed-in tariffs" that allow zero-carbon generated power to be priced at above-market rates; "reverse auctions" that allow clean energy project developers to bid to sign power supply contracts at lowest price; and renewable energy credit schemes that seek to bridge the gap between zero-carbon generated power and fossil-generated power.

   But in the US it has often been the tax code that has been used to support certain energy technologies. Barring some unforeseen major overhaul of the code, I anticipate that will not change anytime soon.

Questions from Senator Mark Warner

1. *Can you comment, and give some perspective on, the role that renewable energy technologies have played as economic drivers across the country?*

   Answer: Our firm does not count jobs created, per se. Those figures are typically compiled by trade organizations such as the American Wind Energy Association or the Solar Energy Industries Association. The Brookings Institution has also sought to quantify jobs in previous studies.

   However, Bloomberg New Energy Finance does track dollar flows associated with clean energy deployment. In 2013, a total of $48.4bn flowed into the US sector, primarily to large-scale wind and solar projects. The financial impact has not been spread evenly across the US by any means. States that have installed larger volumes of new clean power generating capacity, or are leaders in domestic manufacturing of clean energy equipment, or meet both criteria, have benefited most. Iowa, for instance, should have over 10,000 megawatts of installed capacity from wind alone by 2017. The state is also a hub for wind turbine manufacturing and home to four major assembly plants and one servicing facility.

   What makes one state more or less attractive than another for clean energy investment? First, natural resources inevitably play an important role. Sunnier or windier states are, by default, regarded as the best places for building new solar or wind projects. (However, it should be noted that there are two halves of the economic viability equation for renewables; clean power projects can be entirely viable in regions where natural resources are less bountiful – so long as local electricity prices are sufficiently high). States that have implemented policies such as renewable portfolio standards mandating certain levels of clean energy generation also tend to attract more investment.

2. *If you support an "all of the above" approach to energy policy, as I do, you want to ensure all of the eggs in our energy basket have an opportunity to grow. Whether it's a continuation of the benefits on hybrid and electric vehicles, a continuation of the Solar ITC (investment tax credit), or putting back into place modified residential energy retrofits (as I recommended with 25(c) in the EXPIRE Act). But I also know that getting to comprehensive tax reform will require give and take on both sides. My question is, can you do all of this and reduce the overall tax rate? Where would the money come from?*

   Answer: To a large extent, this question falls outside the bounds of my expertise as my focus is on the energy sector not on the US federal budget. Thus I am in no position to make recommendations on policies that may or may not be "revenue neutral."

   That said, it does strike me that if one looks across the entire suite of energy tax incentives, some have been on the books for decades. Congress may ultimately determine that these are no longer

needed as the technologies they subsidize today are mature and entirely economically viable without them. Those technologies that support technologies now entirely proven at scale may be worthy of closer scrutiny. But these are value judgments that policy-makers, not energy industry analysts, must make.

3. *In addition to providing certainty, it's also important to look at how we measure volatility with this. We certainty want to incentivize certainty and price signals will motivate those in industry. How can using the tax code to do an all of the above approach to energy policy, reduce price volatility?*

Answer: There is no way to eliminate volatility or market uncertainty entirely. Energy generation costs are dictated by fuel prices, along with the cost of relevant equipment and the cost of the capital required to finance it all. All of these fluctuate based to a large degree on market conditions.

That said, should policy makers set specific goals for what they aim to achieve based on value judgments, the goals are conceivably obtainable. For instance, were the US to place an explicit price on emitting CO2 into the atmosphere, market participants would adjust accordingly. The level to which the market would react would obviously depend on how that price is set.

The above "carbon tax" idea has been floated by some economists as the most economically rational way to address the CO2 emissions issue (though it should be noted that a number of economists tend to support a carbon tax that covers the *entire* economy and not just the energy sector). In essence, the carbon tax idea penalizes emitters for their activities.

An approach introduced by Senator Baucus in December 2013 also seeks to take CO2 emissions into account through tax policy. But rather than penalize emitters, the Baucus energy tax reform plan would reward generators for emitting less. Those who emit the least (wind, solar, or geothermal power generators) would be rewarded with the highest level of tax credit support.
Those that emit most would receive virtually no such credits. Those that fall in the middle (natural gas generators) would receive a credit but to a lesser degree than renewables projects.

While this is a substantial over-simplification of the Baucus proposal, the basic point is that his white paper seeks to take CO2 emissions into account in setting energy tax policy. What's notable about the Baucus plan is that rather than using the "stick" approach represented by a carbon tax, it offers carrot to offer incentives to generators to emit less.

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Statement for the Record

of

Matt Carr, Executive Director,
Algae Biomass Organization

For the Hearing on

"Reforming America's Outdated Energy Tax Code"

Before

The U.S. Senate
Committee on Finance

Wednesday, September 17, 2014

Chairman Wyden, Ranking Member Hatch, and members of the Committee, thank you for the opportunity to submit this statement for the record on behalf of the Algae Biomass Organization (ABO). We applaud the Chairman, Ranking Member, and the Committee for its attention and leadership on tax reform—in particular, for its focus on how tax reform impacts the energy sector.

The most immediate tax policy issue facing the algae industry is tax extenders. As many members of the Committee have recognized, the stop-and-start nature of many energy tax incentives—including the second generation biofuel producer credit and the special allowance for second generation biofuel plant property—undermines the ability of new energy technologies to attract investment and reach commercialization. ABO urges Congress to immediately extend the tax incentives for second generation biofuel as a way of providing a bridge to tax reform.

Looking ahead, ABO believes that tax reform provides a valuable opportunity to provide taxpayers with certainty, simplicity, and fairness while encouraging economic growth and energy security. In particular, a "technology-neutral" system that rewards innovative, environmentally beneficial processes, feedstocks, and technologies would allow Congress to dramatically simplify the energy tax code by consolidating and eliminating numerous incentives. This type of tax reform would help America achieve a cleaner and more secure energy supply. ABO believes that algae-based energy solutions, including algae-based biofuels and the biological sequestration of carbon dioxide through algae, are well positioned to play an important role in that process.

ABO and the Benefits of Algae

ABO is a non-profit organization whose mission is to promote the development of viable commercial markets for commodities derived from algae—particularly biofuels produced from algae biomass. ABO also delivers information to the public about funding initiatives in the algae industry, organizes collaborative opportunities, and develops quality and measurement best practices for the individuals, companies, and organizations that comprise ABO's membership.[1]

Algae are simple plants that can range from the microscopic (microalgae) to large seaweeds (macroalgae) more than 100 feet in length. Microalgae include both cyanobacteria (formerly called "blue-green algae") as well as green, brown, and red algae. Algae are commonly found around the globe and play an important role in many ecosystems. In particular, algae provide the foundation for the aquatic food chains supporting all fisheries and produce about 70 percent of the oxygen in the atmosphere that we breathe.

Algae are uniquely suited to serve as the foundation for a new generation of renewable liquid fuels. Some benefits of algae as a feedstock for liquid transportation fuel are listed below.[2]

1. The chemical composition of algal oil is almost identical to that of oil from fossil fuels; therefore, algal oil can be blended with existing fuels such as gasoline, diesel, and jet fuel without any changes to our fuel infrastructure. In other words, algal fuel is "drop-in" fuel.
2. Algal oil does not contain the harmful chemical constituents found in crude oil, particularly heavy crude oil, and allows a refinery to operate more economically because is lacks sulfur compounds.

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[1] Algae Biomass Organization, http://www.algaebiomass.org/.

[2] In addition to fuel, algae are increasingly used in a variety of other commercial and industrial products. For instance, algae are used as a food ingredient and a food supplement because of their high omega-3 fatty acid content. Additionally, algae are used as a sustainable animal feed, as a feedstock for the production of sustainable chemicals, and as a component of fertilizers and soil conditioners. Algae Biomass Organization, Other Products – All About Algae.com, http://allaboutalgae.com/other-products/.

3. Algae is an optimal source for bioethanol and can be produced at a competitive cost using CO_2, sunlight, and saltwater. Additionally, algae-based ethanol features the added benefit of producing fresh water as a byproduct.
4. Algae can be grown in brackish water and on marginal land not suited for agricultural use. This means that algae do not compete with food for land.
5. Algae consume carbon dioxide and nitrogen as they grow. This means that companies can use the byproducts of conventional energy facilities to grow drop-in algal fuel.
6. Algal oil and algae-based ethanol are predominantly domestic products, meaning that the development of the algae industry will enhance our energy security. Recognizing the importance of this issue, the Department of Defense has made significant investments in algae-to-fuel technology.
7. Finally, the algae industry is creating jobs.

As the Environmental Protection Agency recently explained, "Some of the potential benefits of using algae as a biofuel feedstock are that algae can be grown on marginal land, can require low water inputs, can recycle waste streams from other processes, does not compete with food production, and has high oil yield."[3]

History of Algae and the Tax Code

To encourage the production of innovative types of renewable fuel, Congress has provided a series of tax incentives, including a tax credit of $1.01 per gallon for the production of cellulosic ethanol. However, until recently most of these tax incentives have not been available for algae-based fuel. This was not the result of a policy decision to exclude algae-based fuel; rather, algae-based fuel, which was not well known when the relevant tax incentives were created, simply did not fit the existing technical definitions.

Congress acted to fix this oversight with the American Taxpayer Relief Act of 2012 (ATRA), which President Obama signed into law on January 2, 2013. ATRA provided tax parity by reforming the $1.01 per gallon cellulosic biofuel tax credit under section 40 of the Tax Code into the "second generation biofuel producer credit," and by including algae-based fuel within this credit. ATRA also provided bonus depreciation to property used to produce "second generation biofuel"—including both cellulosic and algae-based fuel. Although these provisions expired at the end of 2013, if extended they are expected to create thousands of U.S. jobs by facilitating the development of a clean and renewable U.S.-made fuel.

Algae and Tax Policy Today

ABO applauds the Chairman, Ranking Member, and members of the Committee for their commitment and attention to reforming our nation's tax system. ABO believes that tax reform provides a valuable opportunity to provide taxpayers with certainty, simplicity, and fairness while encouraging economic growth and energy security.

In the short term, ABO is committed to resolving the most pressing tax policy issue facing the algae industry today: tax extenders. ABO appreciates the comments from the Chairman, Ranking Member, and other members of the Committee about the importance of enacting a tax extenders package immediately. ABO was very pleased that the EXPIRE Act would extend the second generation biofuel producer credit and the special allowance for second generation biofuel plant property through the end of 2015. In order to encourage continued investment for capital-intensive algae biofuel projects, we urge Congress to immediately enact a tax extenders package that

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[3] U.S. ENVIRONMENTAL PROTECTION AGENCY, RENEWABLE FUEL STANDARD PROGRAM (RFS2) REGULATORY IMPACT ANALYSIS 56 (2010), *available at* http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1006DXP.PDF.

includes these tax incentives. Extending these incentives now would also give Congress the time to consider and develop tax reform proposals.

In the longer term, ABO is also committed to helping resolve the long-term tax policy issues facing the energy industry. For example, ABO supports the development of permanent energy tax policy as an alternative to the temporary and unpredictable nature of energy tax policy today. The start-and-stop nature of many tax incentives has made it more difficult for companies producing algae biofuels to attract financing and make long-term investment decisions, ultimately undermining the continued development of the industry. A permanent system of tax incentives would alleviate this problem by giving businesses the policy certainty they need to grow.

In addition to permanence, ABO strongly supports the development of a performance-based tax system that rewards energy technologies, processes, and feedstocks that offer substantial environmental and energy security benefits. Algae-based biofuels, in particular, offer a variety of environmental and economic benefits compared to comparable products produced from fossil fuels and would be well aligned with these goals. Moreover, a technology-neutral approach to energy tax reform—similar to the one advocated by the Chairman and others on the Committee—has the potential to simplify the energy tax system. Maintaining appropriate credit levels and developing criteria for measuring performance will be challenging, but ABO looks forward to working with the Committee on these issues.

It is also important for the federal tax system to account not only for the current generation of technologies, but for the next generation of transformative technologies. One example of such a technology involves the use of algae as a means of accomplishing carbon capture and sequestration. Current law, as well as the energy tax reform staff discussion draft released last year under former Chairman Max Baucus (D-MT), provides tax incentives for carbon capture and sequestration technologies. However, they rely on an outdated definition of sequestration that focuses only on the "geological storage" of carbon dioxide. They do not include the next generation of carbon capture technologies, such as "biological sequestration," that monetize carbon dioxide through the beneficial reuse of carbon to grow algae. As part of tax reform, we urge the Committee to account for next-generation technologies like biological sequestration so Congress does not need to repeatedly revisit the energy tax code whenever a new technology appears.

In addition, it is important for Congress to ensure that advanced energy technologies are not shut out of tax-preferred financing mechanisms that have long been available to the oil and gas industries. The most prominent example of this disparity in the tax code involves Master Limited Partnerships (MLPs). An MLP is a business structure that is taxed as a partnership (i.e., taxed at the shareholder level but not the entity level) but whose ownership interests are traded like corporate stock. Midstream oil and gas companies, in particular, have used the MLP structure to attract private investment for decades. However, MLPs are not available to companies producing advanced biofuels like algae-based biofuel, producing electricity from renewable sources, implementing biological sequestration technologies, and others involved in the advanced energy sector. ABO urges Congress to provide parity in the tax code by expanding the availability of MLPs to these types of projects, similar to the Master Limited Partnerships Parity Act (S. 795) from Senator Chris Coons (D-DE).

Conclusion

In the short term, ABO urges Congress to immediately enact a tax extenders package to ensure the continued development and growth of the algae industry in the United States. In the longer term, we applaud the efforts from the Chairman, Ranking Member, and members of the Committee on tax reform. ABO believes tax reform has the potential to simplify the tax code to provide stability and certainty to businesses while also encouraging the development of a cleaner and more secure energy supply. We appreciate the opportunity to offer this

statement to the Committee and look forward to working with Congress as it continues to explore comprehensive tax reform.

Sincerely,

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Statement of the American Farm Bureau Federation

STATEMENT FOR THE RECORD
SENATE COMMITTEE ON FINANCE
REFORMING AMERICA'S OUTDATED ENERGY TAX CODE

September 17, 2014

Submitted by the
American Farm Bureau Federation

600 Maryland Ave. SW | Suite 1000W | Washington, DC 20024 | p. 202.406.3600 | f. 202.406.3606 | www.fb.org

Farm Bureau believes that the U.S. should be focused on energy security. We support the development and implementation of a comprehensive energy policy, which includes conservation, efficiency, exploration and research for both the production of traditional and renewable energy sources. We complement the committee for holding this hearing to discuss energy tax policy and options for overhauling tax incentives for the energy sector.

Renewable Fuels: Farm Bureau supports the continuation of the biodiesel and cellulosic ethanol producers excise tax credits, as well as federal incentives for gas stations to install blender pumps for ethanol distribution infrastructure until such time as market conditions warrant their phase out.

Renewable fuels have been a tremendous success story for the nation as a whole as well as to the rural economy. They have reduced our country's dependence on foreign crude oil, reduced air pollution, increased farm income and have provided good paying jobs across rural America. A significant reduction in tax incentives for the production of biodiesel, cellulosic biofuels and delivery infrastructure will hinder new investments and introduce detrimental ambiguity in industries that are still developing.

In addition, farmers and ranchers depend on energy-related products ranging from farm diesel to fertilizer in order to maximize production efficiencies that provide food, feed, fiber and fuel to the world. The production of renewable fuels helps insulate farmers and ranchers from the harm that can be caused to our industry by instant and unpredictable supply and price movement swings in the fuel supply.

Renewable Energy: Farmers, ranchers and other rural landowners benefit from the production of electricity produced from wind and biomass. Farm Bureau supports the continuation of tax incentives for renewable energy production and believes that they should be calculated on a standard Btu/kwh equivalent measurement basis, without regard to the materials, methods or sources used to produce the energy.

Farm Bureau commends the Finance Committee for recognizing that tax incentives for the domestic production of energy, whether from fossil fuels or renewables, serve important policy objectives. We believe their long-term extension will continue to protect the economy from price shocks and enhance national security. We add emphasis to the need for the growth in renewables that come from domestic sources that provide the added benefit of boosting the agriculture economy and rural America.

THE AMERICAN INSTITUTE OF ARCHITECTS STATEMENT FOR THE RECORD

"Reforming America's Outdated Energy Tax Code"

United States Senate Committee on Finance

September 17, 2014

INTRODUCTION

The American Institute of Architects (AIA) appreciates the opportunity to submit this statement for the record.

The AIA applauds the Committee's leadership on energy and energy efficiency tax issues. In particular, Section 179D of the Internal Revenue Code, the Energy Efficient Commercial Building Deduction ("Section 179D" or the "179D deduction"), is an important tax policy for businesses that critically incentivizes energy efficiency.

We commend Senator Cardin for the introduction of S. 2189, the Energy Efficiency Tax Incentives Act, which would improve and extend Section 179D.

We also appreciate the Committee's approval of S. 2260, the EXPIRE Act of 2014, which included a short-term extension of Section 179D, and urge Congress to pass S. 2260 or similar legislation as soon as possible.

Looking ahead, our strong hope is that Section 179D is strengthened and made permanent to further increase its positive impact on the economy and the environment.

THE AIA AND ARCHITECTURE IN OUR COMMUNITIES

The AIA has been the leading professional membership association for architects and allied partners since 1857, representing more than 81,000 architects and emerging professionals nationwide and around the world.

In 2011 alone, the 17,500 architecture firms owned by AIA members grossed billings of $26.0 billion, driving economic activity and job growth. Moreover, most architecture firms at which AIA members work are small businesses, with nearly 97 percent of firms having fewer than 50 employees.

Architecture is about more than just buildings. At a time when our nation faces great challenges that require innovative, forward-thinking solutions, architects are in the business of creative problem-solving.

Architects work to advance our quality of life through their commitment to healthy, safe, resilient, and sustainable communities. From designing the next generation of energy-saving buildings to making our communities healthier and more vibrant, from helping neighborhoods rebuild after disasters to exporting American design know-how to the rest of the world, architects turn dreams and aspirations into reality.

The American Institute of Architects
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SECTION 179D, THE ENERGY EFFICIENT COMMERCIAL BUILDING DEDUCTION

Section 179D provides a deduction for certain energy efficient commercial building property expenditures. The maximum deduction is $1.80 per square foot. In the case that a building does not meet the 50 percent energy savings requirement, a partial deduction of $0.60 per square foot is allowed for each separate building system that comprises energy efficient property and that is certified as meeting required savings targets.

To encourage the public sector to utilize these same energy efficient enhancements, the 179D deduction also provides a federal, state, or local government owner of a commercial building an election to allocate the tax deduction to the primary person responsible for designing the energy efficient enhancements installed in the building.

In the short-term, the 179D deduction enables building owners to offset the often costly expenses associated with energy efficiency enhancements. In the longer-term, building owners who take advantage of the 179D deduction realize significantly lower energy costs, the benefits of leading edge design and construction that enhances the building's long-term market value, and the benefits of a cleaner environment.

In the case of a public entity, the allocation of the 179D deduction, in the short-term, results in savings by allowing the public entity to negotiate a better deal and, in the long-term, allows the public entity to realize ongoing energy savings. The average 179D project (typically $0.60/sq. ft. for lighting upgrades) saves a public entity an average of 20 percent on their energy expenses.

MAKING SECTION 179D PERMANENT

Section 179D has been an effective tool in increasing the energy efficiency of buildings. Section 179D has leveraged billions of dollars in private capital, resulting in the energy efficient construction and renovation of thousands of buildings, while creating and preserving hundreds of thousands of jobs. It is one of the best examples of the tremendous impact tax incentives can have on financing energy efficient property.

Section 179D's success demonstrates the strong need to retain an energy efficiency provision in the tax code. We also strongly urge Congress to make permanent and enhance the Section 179D deduction by:

1) ensuring the ability of pass-through entities to capture the full value of an allocated deduction in the case of a public owner of a building;
2) allowing non-profit owners of buildings, similar to public owners of buildings, to allocate the deduction; and
3) increasing the value of the deduction. These improvements would further increase the impact of Section 179D.

CONCLUSION

AIA appreciates the opportunity to submit this statement for the record. We urge Congress to expeditiously pass tax extenders legislation along the line of the "EXPIRE Act of 2014" to extend Section 179D and other important tax policies; in the context of longer term tax reform, we hope Congress strengthens and makes permanent Section 179D.

The AIA and its members are ready to serve as a resource to Congress and the Committee on these and other issues.

BTEC
Biomass Thermal Energy Council

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September 29, 2014

The Honorable Ron Wyden
Chairman, Senate Finance Committee
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The Honorable Orrin G. Hatch
Ranking Member, Senate Finance Committee
104 Hart Senate Office Building
Washington, D.C. 20510

RE: Statement for the Hearing Record: Reforming America's Outdated Energy Tax Code, September 17, 2014

The Biomass Thermal Energy Council (BTEC) appreciates the opportunity to share our perspective on federal energy tax policy in the context of comprehensive tax reform. BTEC is an association of biomass fuel producers, forest landowners, appliance manufacturers, combined heat and power project developers, thermal energy utilities, district energy systems, supply chain companies and non-profit organizations that view biomass thermal energy as a renewable, responsible, clean and energy-efficient pathway to meeting America's energy needs.

Our nation's tax code has long played a key role in shaping and influencing national energy policy. In the renewable energy arena, the code features numerous incentives for most renewable energy technologies in residential, commercial and industrial installations. In fact, analysis provided by the Joint Committee on Taxation lists 80 separate energy-related tax provisions in existing law. Unfortunately, none of these incentives extends to high efficiency biomass thermal energy, despite the fact that biomass thermal energy fulfills the same public policy objectives as other renewable energy sources. Our tax code recognizes solar thermal and geothermal technologies (e.g. section 25D and section 48), but not technology that produces heat from renewable biomass, an example of the policy "picking winners and losers" within narrow classes of technology. Examples of biomass thermal projects and technologies include heating of homes, businesses, schools, hospitals, commercial and industrial buildings; district heating of campuses, densely developed commercial and industrial parks; neighborhoods and city centers; domestic hot water for large consumers such as laundries; and industrial process heat for companies in food processing, metallurgy, and pharmaceuticals, and combined heat and power projects that produce both heat and electricity for consumers.

BTEC welcomes the Committee's attempt to streamline portions of the tax code dedicated to energy production and eliminate those provisions that no longer have merit. Moreover, we strongly endorse tax reform efforts that provide a level playing field for competing energy technologies and support the concept of technology neutrality. However, we also believe that comprehensive tax reform should embrace energy pathway neutrality and not pick winners and losers in the manner in which renewable energy is delivered. We note with disappointment the Finance Committee's draft tax reform proposal released earlier that excluded renewable energy delivered in the form of heat, with no explanation given for this conscious decision to exclude tax policy consideration for one-third of all energy consumed in the U.S.

BTEC represents the interests of companies in the biomass thermal energy space, but thermal energy is also derived from solar and geothermal sources. As noted above, thermal energy comprises roughly one third of our nation's energy consumption. Despite this fact, energy policy to promote renewable energy has focused entirely on transportation fuels such as ethanol and biodiesel, and electricity from hydro, wind, solar, geothermal, and biomass. These fuels and technologies have received support from the federal government for many years in the form of production and investment tax credits, accelerated depreciation, research and development funding, direct project grants, and renewable energy credits. The 2005 Energy Policy Act, the 2007 Energy Independence and Security Act, and the 2009 American Recovery and Reinvestment Act boosted support for these technologies in many areas. BTEC believes that efforts to comprehensively reform the tax code provide the ideal opportunity to rectify this oversight and provide incentives for which all renewable thermal energy providers can compete on an equal basis.

Tax incentives will help build a market for high efficiency systems that can reduce American dependence on foreign fossil energy, reduce fossil fuel-based greenhouse gas emissions, and create jobs and local economic development from a widely available renewable domestic energy resource. Tax policy that supports biomass

thermal energy will provide the highest possible return for the country in terms of reductions in fossil fuel imports and jobs created. It is estimated that 1,580 jobs will be created for every 5,500 homes that are converted from heating oil to biomass[ii]. Biomass has also accounted for 40 percent of the renewable energy jobs in Germany, more than wind, solar or liquid fuels[i].

Because of the relatively small market penetration of new advanced biomass thermal systems, today's systems are often more expensive compared to fossil-fueled units. In fact, installed systems can cost two to three times as much as a similarly sized oil or gas system. Fuel transport logistics have yet to reach critical mass with few customers spread over large geographic areas, thus increasing the unit cost of fuel distribution. Incentives are necessary to enable biomass thermal technology to be more competitive in the market near term. In time, with increasing market penetration, these incentives can be scaled down or eliminated. As an example, in Europe, there is a thriving biomass heating business employing tens of thousands of people – and the supply of these fuels continues to be cost competitive, without government subsidies.

Crafted correctly, incentives can support innovation while attracting private capital that will drive long term economic growth.

BTEC is a strong supporter of the Biomass Thermal Utilization Act of 2013 (S. 1007). The bill, known as the BTU Act, would qualify highly efficiency thermal energy from biomass for investment tax credits under Sec. 48 and Sec. 25d. The spirit of this proposal is to simply level the playing field so that thermal renewable energy providers are treated equally with those producing liquid fuels, electricity and thermal energy from solar and geothermal. **Our request to the Committee is to keep this principle—technology and pathway neutrality—as a guide post as you continue to craft energy tax reform legislation.**

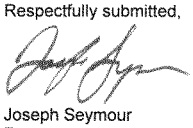
Conclusion

Biomass thermal energy fulfills the same public policy objectives that are the basis and justification for renewable energy tax incentives. These include:

- Reduce consumption of foreign fossil fuel-based energy, thereby increasing America's energy independence
- Increase efficiency of utilization for equivalent energy output, as compared to biomass electric generation and cellulosic biofuels
- Reduce emissions of greenhouse gases due to the low carbon intensity or near carbon neutrality of biomass
- Reduce emissions of certain air pollutants such as sulfur dioxides, PM 2.5, and mercury, as compared to fossil fuels
- Strengthen local economic development and job creation through domestic production of fuels, system installation and service, and fuel distribution for many parts of the country that have neither natural gas nor oil

The current fiscal environment necessitates that tax payer dollars be deployed in a manner that maximizes return on investment. BTEC believes that investment in biomass thermal technologies will achieve optimal efficiency and job creation throughout the country and should be a critical component of your energy tax reform efforts. We look forward to working with the Committee as it continues its work on this critical issue.

Respectfully submitted,



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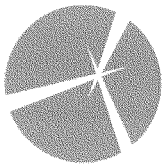
[i] http://www.renewableenergyworld.com/rea/news/article/2008/04/renewable-energy-jobs-soar-in-germany-52089
[ii] http://biomassthermal.org/pdf/Strauss_BTU_Act.pdf



Reforming America's Outdated Energy Tax Code
September 17, 2014

Anne Kelly
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Chairman Wyden and Members of the Senate Finance Committee:

Thank you for the opportunity to submit comments on behalf of Ceres to the Committee following its recent hearing on "Reforming America's Outdated Energy Tax Code." Ceres is a national nonprofit organization mobilizing business and investor leadership on climate change and other global sustainability challenges. Ceres directs the Investor Network on Climate Risk (INCR), a network of 110 institutional investors with $13 trillion of collective assets focused on the risks of climate change. Ceres also coordinates BICEP - Business for Innovative Climate & Energy Policy - a network of 33 companies advocating for strong clean energy policies that includes major firms like Nike, Mars, Starbucks, Owens Corning, Jones Lang LaSalle, eBay, VF Corporation and General Mills.

Comprehensive tax reform presents an opportunity to fix inequities in the tax code while simultaneously correcting the market and policy failures that have contributed to global climate change. However, the prospect of comprehensive tax reform should not let near term needs and opportunities languish. In the near term, Congress has an opportunity to: 1) provide greater equity in the tax code and spur investment by expanding Master Limited Partnerships (MLPs) and Real Estate Investment Trusts (REITs) to clean energy generation projects and 2) provide stability in the market for wind projects through an extension of the Production Tax Credit (PTC) for renewable energy. Our recommendations for making near term improvements to the tax code and lessons for comprehensive reform reflect the current practice of leading companies and investors and the challenges they face.

The Sustainability Challenge and the Role of Corporate and Institutional Investment

Companies and investors face material risks from climate change but can achieve tremendous benefits from investing in the technologies and practices that mitigate climate change. Two indicators of the scale and scope of corporate and investor concern come from recent work among our members and their peers: the Climate Declaration and the Global Investor Statement on Climate Change. Over 1,000 companies have signed the Climate Declaration, which states that "there must be a coordinated effort to combat climate change" and that "tackling climate change is one of the greatest opportunities of the 21st Century."[1] The pension funds, mutual funds, private equity funds, and other institutional investors that invest in the equity and debt of companies- along with investments in a range of other asset classes- also have recognized the risk of climate change and have called for action. A 2011 study by the global investment consultancy Mercer suggested that climate change

[1] The Climate Declaration, http://www.ceres.org/declaration
[2] Mercer, "Climate Change Scenarios: Implications for Strategic Asset Allocation," http://www.mercer.com/articles/1406410, (February 2011)

could add 10% to portfolio risk for institutional investors[2]. Just last week, more than 340 institutional investors managing in excess of $24 trillion in assets released the Global Investor Statement on Climate Change, which states "we are particularly concerned that gaps, weaknesses and delays in climate change and clean energy policies will increase the risks to our investments as a result of the physical impacts of climate change...this could jeopardize the investments and retirement savings of millions of citizens."[3]

The institutional investors and corporations we work with are taking significant actions to mitigate their own climate impacts and will be key constituencies in deploying the capital needed to reach internationally agreed upon climate targets. The International Energy Agency has calculated that US$ 36 trillion in incremental investment is needed by 2050 to have a fifty percent chance of limiting global temperature increases to below 2 degrees Celsius, an internationally recognized threshold between manageable and catastrophic climate change. On an annual basis this target translates into an average of US$1 trillion dollars in incremental clean energy investment. At Ceres, we have dubbed this investment imperative the "Clean Trillion" and have developed a paper[4] that outlines recommendations for catalyzing private capital to meet the need.

Private sector capital will be key to achieving the Clean Trillion and much of that private capital will come from corporate balance sheets and the equity and debt financing provided by institutional investors to these corporates and to finance or refinance clean energy infrastructure. Luckily, this is investment that is already taking place, albeit not at the scale needed.

A recent study conducted by Ceres, Calvert Investments, David Gardiner & Associates and World Wildlife Fund found that 43% of Fortune 500 companies have a renewable energy target, energy efficiency target, greenhouse gas target or some combination thereof. Among America's largest companies—the Fortune 100—this figure is 60% and these companies have saved over $1.1 billion in energy costs annually while reducing emissions by an amount equivalent to closing 15 coal-fired power plants. The majority of companies pursuing these goals are succeeding. The report found that 80% of companies with expiring goals met them in 2012, the last year of data. Of those companies, 85% went on to set new goals or continue other goals already underway. [5]

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[2] Mercer, "Climate Change Scenarios: Implications for Strategic Asset Allocation," http://www.mercer.com/articles/1406410, (February 2011)
[3] Global Investor Coalition on Climate Change, "Global Investor Statement on Climate Change," http://globalinvestorcoalition.org/investor-statements-on-climate-change/, (September 2014)
[4] Ceres, "Investing in the Clean Trillion: Closing the Clean Energy Investment Gap," http://www.ceres.org/issues/clean-trillion, (January 2014)
[5] Ceres, "Power Forward 2.0: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value," http://www.ceres.org/resources/reports/power-forward-2.0-how-american-companies-are-setting-clean-energy-targets-and-capturing-greater-business-value/view, (June 2014)

Institutional investors have likewise pursued clean energy strategies. Following the aforementioned Mercer climate change report, some of the world's largest pension funds- including the Swedish pension fund AP1 and the AustralianSuper pension fund- have modified their overarching investment strategy (known as the "strategic asset allocation") to limit risks from climate change. Many are buying "green bonds;" Bloomberg New Energy Finance predicts that such bond issuances will exceed $40 billion in 2014, more than triple the amount in 2013[6]. INCR member CalSTRS- the second largest pension fund in the United States- has alone invested $1.4 billion in clean energy and technology, and recently announced it would increase that amount to $3.7 billion over the next five years[7].

These investments have been incentivized in part by policies imbedded in the tax code that have functioned to indirectly price carbon in the absence of an explicit carbon price. These policies have supported significant corporate investment in renewable energy, either by: 1) directly supporting adoption of clean energy technologies by lowering the cost of purchasing them or their energy and/or 2) by scaling technology deployment which has, in turn, created financial and technological innovation relevant to our members. At the federal level, the PTC (section 45), the investment tax credit (ITC) (section 48), and accelerated depreciation (section 168) have been the key incentives for deploying renewable energy. Despite some of the challenges of incentivizing renewable energy through the tax code, these incentives have been important to our members' clean energy investments.

The American Council on Renewable Energy has identified the PTC, ITC, and accelerated deprecation as the most important incentives for incentivizing wind and solar deployment in the United States[8]. Even though few INCR members can utilize tax credits and depreciation directly by providing tax equity to projects, some can invest in other elements of renewable energy project finance, particularly by participating as limited partners in renewable energy private equity funds. Many more investors own stock and bonds in a wide range of companies providing the renewable energy services and products that have been incentivized by the PTC, ITC, and accelerated depreciation.

These policies are also allowing for financial development and innovation. As renewable energy has scaled, new opportunities for investment in renewable

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[6] Bloomberg New Energy Finance "Green Bonds Market Outlook," http://about.bnef.com/white-papers/green-bonds-market-outlook-2014, (June 15th, 2014)

[7] Barry Burr, "CalSTRS announces big boost in clean energy, technology investments ahead of the U.N. Climate Summit", *Pensions and Investments*, http://www.pionline.com/article/20140919/ONLINE/140919814/calstrs-announces-big-boost-in-clean-energy-technology-investments-ahead-of-the-un-climate-summit, (September 19th, 2014)

[8] US Partnership for Renewable Energy Finance, "Renewable Energy Policy, Finance, and Market Overview," http://uspref.org/images/docs/Renewable_Energy_Market_Overview_April_2014.pdf (April 2014)

energy have become available, as renewable energy financiers have sought to refinance investments in renewable energy infrastructure or issue debt to finance new renewable energy projects. These have included corporations and project developers issuing bonds to finance or refinance projects, such as two bond offerings from Berkshire Hathaway's Mid American Energy, a utility. More recently asset backed securities have provided another opportunity for investing in renewable energy infrastructure without participating in project finance. Solar City has been the first to issue such bonds for selling its portfolios of solar power purchase agreements, but similar bond issuances are expected to become commonplace. Another recent development- YieldCos- have provided a route for investing in clean energy infrastructure just as one would a stock of a publicly traded company. Such private sector investment would not exist had not incentives helped to commercialize clean energy technologies; indeed, the same can be said of the $10 billion in tax incentives and millions more in government funded research that were critical to realizing today's shale oil and gas boom[9].

The financial maturation of renewable energy financing has begun to ameliorate two drawbacks of renewable energy finance: a limited universe of investors able to invest in renewable energy infrastructure and the high capital costs for renewable energy projects. Some of this challenge is simply the nature of a growing asset class. However, the challenge is exacerbated by the tax code.

Many of our investors are tax-exempt pension funds that cannot monetize renewable energy credits. Indeed, only about two dozen companies—mostly in the financial services industry—provide tax equity financing to projects; this raises the cost of capital for these projects. A 2012 analysis by the Climate Policy Initiative noted that exchanging tax credits with taxable cash grants, which would have the benefit of reducing tax expenditures and could ameliorate tax equity's drawbacks[10]. In the near term, however, an extension to expiring credits is critical.

Modifying MLP and REIT Rules Could Increase Investment and Provide Equity

There are provisions in the tax code that could be modified in the near term to both provide greater equity among energy sources and provide readily investable opportunities for a broad universe of institutional and individual investors. Two areas in particular are an expansion of MLPs and REITs to renewable energy finance.

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[9] American Energy Innovation Council, "Case Studies on the Government's Role in Energy Technology Innovation: Unconventional Gas Exploration and Production," http://americanenergyinnovation.org/wp-content/uploads/2013/03/Case-Unconventional-Gas.pdf (2013)

[10] Climate Policy Initiative, "Supporting Renewables While Saving Taxpayers Money," http://climatepolicyinitiative.org/wp-content/uploads/2012/09/Supporting-Renewables-while-Saving-Taxpayers-Money.pdf , (September 2012)

MLPs have been a tool for financing mostly mid-stream oil & gas assets. MLPs are a corporate structure in which the partnership sells shares just as a corporation would sell stocks. MLP investments only face one layer of taxation, unlike a corporation where two layers of taxation exist: corporate taxes and taxes borne by investors on their investments in the company. This tax-advantaged structure boosts yields and have made MLPs popular investments, particularly in the current low-yield investment environment. Like oil and gas pipelines, renewable energy projects create the steady revenue streams that successful MLPs rely on. However, in an effort to limit overuse of the MLP structure, the last comprehensive reform of the federal tax code limited energy-related MLPs to infrastructure for depletable resources. Co-sponsored by a range of bipartisan members in both chambers, the Master Limited Partnership Parity Act (S. 795) provides a fix to the statutory limitation against renewable energy MLPs.

REITs are another area where Congress has created a publicly tradable investment vehicle through the tax code. Typically comprised of commercial and institutional real estate, REITs are a tax-advantaged investment similar to MLPs but far more common. REITs comprise 9% of the S&P 1000 and are a major component of the financials sector, as such they are commonly held as part of broadly-diversified investment portfolios for retirement savings and other retail and institutional investments. In recent years, the Internal Revenue Service has allowed a larger universe of assets to be eligible property for inclusion in REITs, including billboards and cell phone towers. However, despite having highly similar characteristics to REIT-eligible property—including immovable property and reliable lease-like payments—the Internal Revenue Service has chosen to only move forward in narrowly considering building-sited (and utilized) renewable energy projects as REIT eligible property. Congress could provide a statutory fix that gives broader inclusion of renewable energy generation assets in REITs.

Most of the investors we work with through our Investor Network on Climate Risk are investing primarily in public capital markets; project financing is rare among this group for renewable energy or any other assets. Even large pension funds have about three-quarters of their assets invested in the public capital markets. MLPs and REITs could provide a means for greater investment in renewable energy within the bounds of their existing overall asset allocation by expanding a well known and liquid asset class to renewable energy.

Longer-Term, Comprehensive Tax Reform Provides an Important Opportunity, but Raises Many Questions

Comprehensive tax reform provides an opportunity for a policy response at the scale and scope needed to address climate change. An explicit carbon price in a revised tax code could provide a strong and sustained market signal to invest at an adequate level in the technologies, business models, and business practices required to avoid catastrophic climate change. However, at this time we are not prepared to

comment on specific proposals or recommendations related to pricing carbon through the tax code.

What we do know is that the private sector is showing carbon pricing and emissions reductions to be feasible. A number of leading companies are already using internal carbon prices to shape their own practices and investments. A recent report by the organization CDP found that 150 companies- including 29 major US companies such as Dow Chemical Company, Goldman Sachs and ExxonMobil- have internal carbon prices; over 638 companies they've surveyed see carbon pricing as an opportunity for their business[11]. An explicit carbon price in the tax code could take corporate practices and make them commonplace, though implementing this through tax reform would require answering significant, complicated, and contentious questions about the proper level of such a price, the means of enacting it, the use of its revenues, and the potential costs and benefits of having such a tax in tandem with—or in lieu of—current incentives.

As legislators, the private sector, and not-for-profit entities grapple with how to adequately and effectively price carbon and the opportunities to do so in comprehensive tax reform, we should be sure not to undermine the significant investments and achievements being made by companies and investors that have occurred within—and have been shaped by—our current tax code. Per our earlier comments, we hope both chambers can follow the lead of the Senate Finance Committee in passing an extension of the Production Tax Credit. We also hope that members of the Committee will work to promote the Master Limited Partnership Parity Act as part of a tax extenders package and encourage the Internal Revenue Service to expand REITs to a broader class of renewable energy applications.

Thank you again for the opportunity to comment. Should you have questions please do not hesitate to contact Anne Kelly, Director of Policy, at Kelly@ceres.org

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[11]CDP "Global Corporate Use of Carbon Pricing: Disclosures to Investors," https://www.cdp.net/cdpresults/global-price-on-carbon-report-2014.pdf (September 2014)

COMFORT SYSTEMS USA ENERGY SERVICES

September 16, 2014

TO:

Senate Committee on Finance
Attn. Editorial and Document Section
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Dirksen Senate Office Bldg.
Washington, DC 20510-6200

FROM:

W. Brewster Earle
President
Comfort Systems USA Energy Services
7 Waterside Crossing
Windsor, CT 06095

RE: Hearing: Reforming America's Outdated Energy Tax Code

Dear Senators Wyden & Hatch:

Recent international events make it abundantly clear that Energy Security is critical to America's well-being. Long Term Energy Security is not something free markets can efficiently solve on their own. Especially, when many conventional fuels are supplied by non-free market countries. Simply look at the natural gas issues in Central and Eastern Europe and you can see what a single non-free market country can do to affect Energy Security. To combat this, it is important that Congress utilize the tax code and its regulatory power to tilt the playing field in a way that secures our Long Term Energy Security.

We recommend that Congress should A.C.E. Long Term Energy Security.

"A"lternative Energy

The only way to ensure a Long Term solution is by methodically replacing Conventional Fuels and Generation with Alternative Fuels and Generation. This does not mean picking winners and losers, but, it will require incentives that allow fledgling industries to grow faster than what the free market would typically allow. These incentives should occur both at the manufacturing level as well as the consumer level, and should be pre-designed to expire once a technology reaches conventional parity. Whether that means a tax credit for each gallon of ethanol or cellulosic ethanol produced until the manufacturing of these biofuels reach parity with gasoline or a consumer can get a tax credit to install Solar on their roof to bring the payback down to a more reasonable 5 year time frame.

"C"onventional Fuels and Generation

Our country is blessed with an abundance of natural resources, and the fastest way to Immediate Energy Security is by exploring and extracting as much Coal, Oil and Natural Gas as safely and prudently as possible. Our regulations should be in line with maximizing our ability to safely and prudently explore and extract these resources where they lie. In addition, our tax code should assist those taking the financial risk of exploration and extraction with favorable tax treatment for the expensive assets required in these endeavors.

COMFORT SYSTEMS USA ENERGY SERVICES

But in the Long Term, we know these resources are finite, thus necessitating the inclusion of the "A" and "E" aspects of A.C.E.

"E"fficiency and Conservation

Traditionally, Efficiency and Conservation have taken a back seat to the other two. Let's face it, changing light bulbs to cut the cost of lighting a building by 75% is just not as sexy as a Wind Turbine or a new Oil Sand find. But, it is here, that Congress could likely make the most Immediate gains towards Long Term Energy Security. The kWh not used, does not need to be generated Conventionally nor Alternatively.

Some estimate that between 10-20% of our energy consumption is pure waste. From "vampire power" in our appliances while they are sitting unused, to line losses in our aging distribution grid, these wastes can be easily remedied with a combination of regulation and incentives. Some will decry this as the "Nanny State" but it is important to have the end goal of Long Term Energy Security in mind. Our precious resources should not be squandered on electricity that never reaches consumers simply because utilities do not have the economic incentive to upgrade their aging distribution infrastructure.

That is just on the waste side, once efficiency is brought in to the equation, savings of up to 50% are possible. For example, studies have estimated that commercial buildings represent 20% of this country's overall energy consumption. Regulations that require ever more efficient building codes paired with incentives like EPAct 179D that reduce the pay back for costly investments in energy efficient building equipment have shown success in reducing commercial building energy efficiency. The eight years of section 179D incentives have demonstrated that incentives for energy efficient lighting and HVAC can help American buildings substantially reduce energy use.

A.C.E. Long Term Energy Security

The Long Term Energy Security of our country needs to be ACE'd. Unfortunately, the free market cannot do it on its own. Now more than ever, the tax code and regulations need to be utilized to ensure our Long Term Energy Security.

Sincerely,

W. Brewster Earle

President

Comfort Systems USA Energy Services

7 Waterside Crossing

Windsor, CT 06095

COMFORT SYSTEMS USA ENERGY SERVICES

Introduction to CSUSAES

CSUSAES is the wholly owned Energy Services subsidiary of Comfort Systems USA. We deliver lower operating costs to our clients by reducing energy consumption. This is accomplished with engineered solutions that deliver more efficient building systems such as heating, cooling and lighting.

HVAC systems are the single largest energy consuming building system in most commercial facilities in the United States. As the cost of energy increases, the importance of proper service and maintenance is magnified and upgrading or replacing outdated or less-efficient systems makes good business sense. Our services are timely as more and more federal and state agencies provide incentives to help your business increase energy efficiency.

USE OUR ENERGY TO SAVE YOURS!®

Comfort Systems USA's energy-efficiency expertise across our many locations focus on helping our customers conserve energy and deliver bottom line improvement. Our understanding of the technology and the economics of building systems delivers meaningful, engineered solutions for our customers. Effective performance of your building systems will drive down total energy costs, and the energy cost savings often offset the cost to install improved systems and maintain them for efficiency.

The first step is to identify your objectives and criteria for performing a retrofit, or new construction project. We review your best alternatives, the lifecycle costs, and the economics of your investment. We then provide Energy Smart Decision Tools® to help you make the choice that is right for your company.

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Statement for the Record

Submitted by Ted Michaels
President, Energy Recovery Council
To the U.S. Senate Committee on Finance
Hearing on "Reforming America's Outdated Energy Tax Code"
Wednesday, September 17, 2014

The Energy Recovery Council appreciates having the opportunity to submit a statement for the record on this important hearing on "Reforming America's Outdated Energy Tax Code." The Finance Committee's leadership and willingness to reform the important tax incentives that help drive the production and use of clean energy is commendable, and ERC stands ready to work constructively with the Finance Committee to achieve this important policy goal.

ERC is the national trade association representing companies and local governments engaged in the waste-to-energy sector. There are 84 waste-to-energy facilities in the United States, which produce clean, renewable energy through the combustion of municipal solid waste in specially designed power plants equipped with the most modern pollution control equipment to clean emissions. Trash volume is reduced by 90% and the remaining residue is safely reused or disposed in landfills. America's 84 waste-to-energy plants have a baseload electric generation capacity of more than 2,750 megawatts. These important facilities process approximately thirty million tons of trash per year and recover valuable energy from the waste, enabling these facilities to send nearly 15 million megawatt hours of electricity to the grid, as well as export steam to local users. In addition, waste-to-energy facilities recover and recycle more than 700,000 tons of metals per year. On average, waste-to-energy facilities avoid one ton of carbon dioxide equivalents for every ton of waste processed when evaluated on a lifecycle basis, or stated another way avoid 2,000 pounds of CO2e for every megawatt hour generated.

Waste to Energy Experience with Current Law:

Overview of Current Law:

Current law provides several important tax incentives to encourage the production and use of renewable electricity. The Section 45 PTC is available to qualifying wind, closed-loop biomass and geothermal projects. A reduced PTC is available for hydropower, small irrigation, open-loop biomass and municipal solid waste, including WTE technology. Qualifying projects that commence construction prior to January 1, 2014 are eligible to claim the credit.

In addition, a 30 percent Section 48 ITC is available to qualifying solar, geothermal, fuel cell, microturbines, combined heat and power, small wind and geothermal heat pump systems that are placed in service by December 31, 2016. *The American Taxpayer Relief Act of 2012* (P.L. 112-240) also allows PTC eligible projects that commence construction prior to January 1, 2014 to claim the ITC in lieu of the PTC.

Competitiveness, Levelized Cost and Tax Policy:

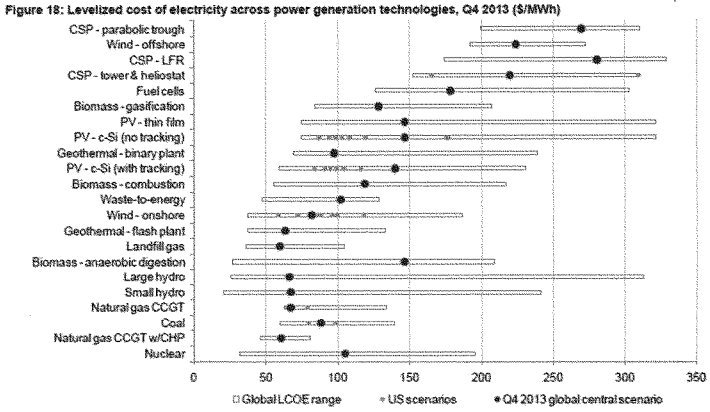
The structure and function of current law clean energy tax incentives have had the practical effect of putting WTE companies at competitive disadvantage in the marketplace.

All things being equal, WTE is a competitive renewable energy technology. The U.S. Department of Energy's Energy Information Administration ("EIA") typically uses Levelized Cost ("LCOE") to measure the competitiveness of a particular energy resource. EIA defines LCOE as:

> *"Levelized cost is often cited as a convenient summary measure of the overall competiveness of different generating technologies. Levelized cost represents the present value of the total cost of building and operating a generating plant over an assumed financial life and duty cycle, converted to equal annual payments and expressed in terms of real dollars to remove the impact of inflation. Levelized cost reflects overnight capital cost, fuel cost, fixed and variable O&M cost, financing costs, and an assumed utilization rate for each plant type."*

As the following chart demonstrates, WTE technology has a LCOE that is competitive with other commercial sources of renewable electricity.

Figure 18: Levelized cost of electricity across power generation technologies, Q4 2013 ($/MWh)



Source: Bloomberg New Energy Finance, EIA Notes: LCOE is the per-MWh inflation-adjusted lifecycle cost of producing electricity from a technology assuming a certain hurdle rate (ie, after-tax, equity internal rate of return, or IRR). The target IRR used for this analysis is 10% across all technologies. All figures are derived from Bloomberg New Energy Finance analysis. Analysis is based on numbers derived from actual deals (for inputs pertaining to capital costs per MW) and from interviews with industry participants (for inputs such as debt/equity mix, cost of debt, operating costs, and typical project performance). Capital costs are based on evidence from actual deals, which may or may not have yielded a margin to the sellers of the equipment; the only 'margin' that is assumed for this analysis is 10% after-tax equity IRR for project sponsor. The dark-colored circles correspond to a global central scenario, with the exception of nuclear, gas, and coal – where the light blue circles correspond to US-specific scenarios; there are multiple light blue circles per technology, corresponding to different projects, with varying economics, that have been installed in the US across different regions. 'CHP' stands for combined heat and power; 'CCGT' stands for combined cycle gas turbine; 'c-Si' stands for crystalline silicon; 'CSP' stands for concentrated solar power; 'LFR' stands for linear Fresnel reflector.

Current law renewable electricity tax incentives, namely the PTC and ITC, have been highly effective in spurring the deployment of certain types of technology. For example, the rapid growth in deployment and declining costs the U.S. has experienced with wind and solar energy is due in large part to the fact that the PTC and ITC are structured in a manner that readily allows these industries to effectively utilize these tax incentives.

By contrast, and despite being a technology with a competitive LCOE that produces reliable baseload electricity, growth has been incredibly challenging. This is due in large part to the structure of the PTC. Under current law, WTE projects are eligible for a PTC that is one half the value on a per kilowatt hour basis compared to the PTC that can be claimed by eligible wind, geothermal and closed-loop biomass projects. As a practical matter, however, the PTC cannot be utilized by WTE facilities because of, among other things, the long lead times and unique permitting and engineering requirements associated with these otherwise economically competitive projects. The ability of other technologies to utilize the PTC and ITC while WTE technology is effectively denied similar tax treatment under current law has the practical impact of putting WTE technology at a distinct competitive disadvantage in the energy marketplace.

ERC Perspective on Energy Tax Reform

ERC Supports Maintaining Clean Energy Tax Incentives in a Reformed Tax Code:

Experience with the current law PTC and ITC has shown that tax incentives can effectively promote the deployment and use of low-carbon technologies when taxpayers can readily access and utilize the incentives. To address the nation's environmental and energy policy objectives, it is appropriate for Congress to provide tax incentives that encourage the production and use of clean energy within the context of tax reform. ERC supports the goal of providing clean energy tax incentives to technologies that reduce GHG emissions.

The Need for Policy Certainty and Reliability:

Long-term policy certainty is the optimal way to maximize the environmental, economic and energy diversity benefits of a tax incentive designed to spur the deployment of clean and renewable energy technologies such as WTE. Accordingly, we support providing a long-term, seamless and reliable clean energy tax incentive in the Internal Revenue Code.

A permanent clean energy incentive would be the best way to spur private sector investment and provide certainty in the marketplace, as it would significantly mitigate the regulatory, legal and legislative uncertainty that hinders the deployment of clean energy technology. The historically short-term and sporadic duration of federal clean energy tax incentives has specifically hindered the development of new WTE projects, and as a result, has made energy and MSW management policies that increase GHG emissions more attractive from an economic perspective.

Policy certainty is vital to the WTE industry. Due to the unique permitting, financing, engineering and municipal negotiations required to build a new WTE facility, it takes a minimum of five to eight years from project inception to place a WTE facility in service. These long project lead times combined with the limited and sporadic duration of federal tax incentives

has impeded companies' ability to access the existing renewable energy tax incentives that have been widely available and utilized by other participants in the energy marketplace. Providing municipalities and private industry the certainty needed to incorporate the value of an incentive in a WTE project's financing model will significantly improve the prospects of a project coming to fruition, and in the process, level the competitive playing field for WTE projects.

Environmental Metrics are Warranted but Must be Carefully Crafted:

ERC fully supports the premise that clean energy tax incentives should be directed to technologies that have been proven to reduce GHG emissions. However, it is imperative that the regime prescribed in tax reform to determine a technology's environmental performance not have the unintended consequence of causing unnecessary regulatory and legal uncertainty for technologies such as WTE that have been clearly shown to reduce lifecycle GHG emissions.

The Bridge to Tax Reform for Waste to Energy Producers:

On April 28, 2014, the Finance Committee reported S. 2260, the *Expiring Provisions Improvement Reform and Efficiency* ("EXPIRE") *Act of 2014.* The committee report notes that the EXPIRE Act if meant to serve as a bridge to tax reform.

We view tax reform as an opportunity for policymakers to craft a stable, reliable and equitable clean energy tax incentive that would allow WTE projects to utilize the clean energy incentives in a manner consistent with the tax treatment that is provided to other renewable energy producers. However, with consideration of the realities and timing of the legislative process, we recognize the need for Congress to take steps that will address immediate policy needs, such as the EXPIRE Act, and serve as a bridge to tax reform.

Consistent with the short-term need to provide taxpayers with a bridge to tax reform, we would encourage the Finance Committee to consider and ultimately incorporate a modification to the PTC that has been proposed by U.S. Senator Robert Menendez (D-NJ) in any end of year tax package. This proposal would allow qualifying open-loop biomass and WTE facilities placed in service prior to date of enactment to claim the PTC for qualifying electricity production occurring during the time two year time period covered by the EXPIRE Act. Facilities qualifying for this modification would be prohibited from claiming an aggregate stream of credits totaling more than ten years.

With respect to WTE technology, without the Menendez proposal, a short-term extension of the current law PTC will have the inadvertent but very real consequence of continuing the policy inequity that puts WTE providers at a competitive disadvantage.

Challenging economic conditions threaten the continued operation of certain utility scale renewable electricity generation facilities placed in service before January 1, 2013. These facilities, which utilize municipal solid waste and open-loop biomass feedstocks to make electricity for sale to the electrical grid, provide numerous environmental and public policy benefits including emissions reductions, waste removal and rural employment. For the reasons referenced above, many of these facilities were never eligible to claim the 10 years of production

credits generally allowed for other competing renewable electricity technologies. To keep these facilities in operation, and to incentivize owners to reopen shuttered facilities, it constitutes sound energy policy to allow qualifying facilities to access a two-year stream of production credits on new electricity production.

ERC would welcome favorable consideration of the proposal put forward by Senator Menendez to serve as a bridge to tax reform and address the immediate needs of WTE and biomass power producers.

In Conclusion:

ERC sincerely appreciates the committee's efforts to reform and improve the important tax incentives that encourage the domestic deployment and use of clean energy technologies. Experience has shown that properly crafted tax incentives can help the nation meet its larger energy and environmental policy objectives, and we stand ready to work constructively with the committee to craft an energy tax reform package that addresses the shortcomings of current law and includes WTE technology.

Energy Tax Savers

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September 17, 2014

Charles Goulding
President
Energy Tax Savers, Inc
144A Jackson Ave
Syosset, NY 11791

RE: Hearing: Reforming America's Outdated Energy Tax Code
Wednesday, September 17, 2014, 10:15 AM

United States Senate Committee on Finance,

Recent international events make it abundantly clear that Energy Security is critical to America's well being. Long Term Energy Security is not something free markets can efficiently solve on their own. Especially, when many conventional fuels are supplied by non-free market countries. Simply look at the natural gas issues in Central and Eastern Europe and you can see what a single non-free market country can do to affect Energy Security. To combat this, it is important that Congress utilize the tax code and its regulatory power to tilt the playing field in a way that secures our Long Term Energy Security.

We recommend that Congress should A.C.E. Long Term Energy Security.

"A"lternative Energy

The only way to ensure a Long Term solution is by methodically replacing Conventional Fuels and Generation with Alternative Fuels and Generation. This does not mean picking winners and losers, but, it will require incentives that allow fledgling industries to grow faster than what the free market would typically allow. These incentives should occur both at the manufacturing level as well as the consumer level, and should be pre-designed to expire once a technology reaches conventional parity. Whether that means a tax credit for each gallon of ethanol or cellulosic ethanol produced until the manufacturing of these biofuels reach parity with gasoline or a consumer can get a tax credit to install Solar on their roof to bring the pay back down to a more reasonable 5 year time frame.

"C"onventional Fuels and Generation

Our country is blessed with an abundance of natural resources, and the fastest way to Immediate Energy Security is by exploring and extracting as much Coal, Oil and Natural Gas as safely and prudently as possible. Our regulations should be in line with maximizing our ability to safely and prudently explore and extract these resources where they lie. In addition, our tax code should assist those taking the financial risk of exploration and extraction with favorable tax treatment for the expensive assets required in these endeavors.

But in the Long Term, we know these resources are finite, thus necessitating the inclusion of the "A" and "E" aspects of A.C.E..

"E"fficiency and Conservation

Traditionally, Efficiency and Conservation have taken a back seat to the other two. Let's face it, changing light bulbs to cut the cost of lighting a building by 75% is just not as sexy as a Wind Turbine or a new Oil

Sand find. But, it is here, that Congress could likely make the most Immediate gains towards Long Term Energy Security. The kWh not used, does not need to be generated Conventionally nor Alternatively.

Some estimate that between 10-20% of our energy consumption is pure waste. From "vampire power" in our appliances while they are sitting unused, to line losses in our aging distribution grid, these wastes can be easily remedied with a combination of regulation and incentives. Some will decry this as the "Nanny State" but it is important to have the end goal of Long Term Energy Security in mind. Our precious resources should not be squandered on electricity that never reaches consumers simply because utilities do not have the economic incentive to upgrade their aging distribution infrastructure.

That is just on the waste side, once efficiency is brought in to the equation, savings of up to 50% are possible. For example, studies have estimated that commercial buildings represent 20% of this country's overall energy consumption. Regulations that require ever more efficient building codes paired with incentives like EPAct 179D that reduce the payback for costly investments in energy efficient building equipment have shown success in reducing commercial building energy efficiency. The eight years of section 179D incentives have demonstrated that incentives for energy efficient lighting and HVAC can help American buildings substantially reduce energy use.

A.C.E. Long Term Energy Security

The Long Term Energy Security of our country needs to be ACE'd. Unfortunately, the free market cannot do it on its own. Now more than ever, the tax code and regulations need to be utilized to ensure our Long Term Energy Security.

Sincerely,

Charles Goulding

RE: Hearing: Reforming America's Outdated Energy Tax Code
Wednesday, September 17, 2014, 10:15 AM

Dear Senate Committee on Finance,

I am writing to you today to urge the inclusion of Section 179D, Energy Efficient Commercial Buildings Deduction as part of a Tax Extender Package.

I am a LEED Green Associate who represents energy saving lighting for building retrofits. We have a long way to go in this country to get old lighting systems retrofitted. The effort to do these retrofits increases our energy independence AND the number of jobs available in a still-weak economy. A tax incentive helps struggling companies afford new lighting which will decrease their energy bills and make their businesses more sustainable in the long run.

As you know, 179D directly supports two national priorities: Job Creation and Energy Independence. 179D was introduced into the tax code with the Energy Policy Act of 2005. It was further extended in 2008, with current expiration set for January 1, 2014. Since the inception of 179D, it has assisted thousands of building owners in retaining jobs and increasing profitability; it has also increased job creation in the trades, where energy efficiency retrofits create large numbers of high paying jobs for a labor pool that was particularly impacted by the economic downturn. At the same time, 179D helps reduce our nation's dependence on foreign oil, thereby increasing America's energy security.

Jobs

Energy efficiency projects require enormous skilled and semi-skilled work forces. By cost-justifying projects, EPAct therefore plays a direct role in supporting a major source of employment in our state.

Lighting retrofits require lighting designers, laborers to remove and dispose existing fixtures, distribution centers to store the new lighting material, laborers to stage the new material near the job site and electricians to install the new fixtures.

HVAC retrofits require engineers for project system design, substantial U.S. manufacturing activity (most HVAC equipment is heavy and made in the U.S.), U.S. steel procurement and HVAC mechanics to install.

The building envelope involves a wide variety of manufactured and workshop materials including roofs, walls, windows, doors, foundations and insulation. In addition to the labor required to create these products, large numbers of roofers, carpenters, installers and laborers are needed to handle the material and incorporate it into a building.

Also, reduced building expenses allow for the retention of jobs on the building owners' end.

Energy Security

Our nation's goal of becoming energy independent cannot be achieved through domestic oil and natural gas production alone. Energy Efficiency is an untapped natural resource. Commercial Buildings represent

20% of our nation's energy use. "Drilling" for building energy efficiency is the least costly natural resource we have. For building owners, the upfront cost of retrofitting is expensive, but with utility and government assistance working together with building owners, energy use reductions between 20% and 50% can be obtained.

Commercial building energy efficiency is a critical way by which utilities can meet newly established national guidelines for carbon emission reductions. By improving the cost benefit equation of an energy efficiency retrofit, Section 179D thereby plays an important role in helping utilities comply with national policy while simultaneously reducing the need for the construction of costly new power plants.

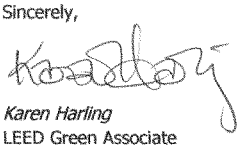
Looking Ahead

Today, taxpayers and industry understand how to prospectively use 179D to achieve the greatest possible energy reduction far better than they did eight years ago. This extension will empower our country to realize major energy efficiency gains and will not represent a material cost to Treasury. With the use of dynamic scoring the efficiency gains will increase taxable income over time for commercial building owners, and thereby reducing Treasury's losses from accelerating the depreciation.

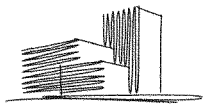
Conclusion

Section 179D supports a key investment in the American economy. Energy efficiency is a force-multiplying investment that saves energy, saves money, and sustains and creates American jobs. Comprehensive energy efficiency upgrades drastically improve the reliability and performance of the nation's building stock, while reducing demand on our energy supply. We strongly support its inclusion as the Senate Finance Committee contemplates Tax Extenders.

Sincerely,



Karen Harling
LEED Green Associate
702-956-4534



VIA FIRSTCLASS MAIL

September 16, 2014

Senate Committee on Finance
Attention: Editorial and Document Section
Rm. SD-219
Dirksen Senate Office Bldg.
Washington, DC 20510-6200

RE: Hearing: Reforming America's Outdated Energy Tax Code
Wednesday, September 17, 2014, 10:15 AM

Dear Senate Finance Committee,

Please accept this letter on behalf of Lake Washington Partners, which is a family business that owns, manages and develops real estate in all four corners of the country. Lake Washington Partners urges the extension of 26 USC § Section 179D and its tax deduction for energy efficient commercial buildings.

Historically, Section 179D has impacted Lake Washington Partners' decision making process in determining whether to construct new commercial space and what retrofit actions to implement to its existing buildings. Lake Washington Partners has consistently promoted its property being at the forefront of energy efficiency. Such action creates significant savings in energy costs and expenses as buildings are or become more efficient, which lowers demand on current power grids, reduces carbon emissions and moves our nation closer to energy independence.

Additionally, Lake Washington Partners' actions have a meaningful impact by the creation of immediate construction and manufacturing jobs through new property development and the retrofitting of existing buildings, as well indirectly impacting the operation of its related distribution business, and the business of its unrelated tenants, by reducing operating costs and allocating funds otherwise spent on energy expenses to the hiring of more employees, at better wages and ultimately, the creation a larger US employment pool. The extension of Section 179D will have a ripple effect across the construction, manufacturing and service sectors of the United States' economy.

In the past few years, Section 179D has incentivized Lake Washington Partners to build over 3,000,000 square feet of warehouse and office space, in five states (AZ, FL, MN, NJ, NV, and TX), and create more than 1,600 jobs at these locations. Presently, we are contemplating expanding our properties, by another

3,000,000 square feet, at several of these locations. Extending Section 179D will make that decision a lot easier.

Lake Washington Partners is committed to promoting the construction and operation of energy efficient commercial buildings. It hopes that the members of the US Senate Finance Committee shares its passion and extends Section 179D.

Thank you.

Lake Washington Partners

Jordan Lott

CC: The Honorable Orrin Hatch
The Honorable Ron Wyden
The Honorable Bill Nelson
The Honorable Robert Menendez
The Honorable Sherrod Brown
The Honorable Rob Portman
The Honorable John Cornyn
The Honorable Maria Cantwell

NAESCO National Association of Energy Service Companies

Statement for the Record

Submitted by

The National Association of Energy Service Companies
1615 M Street, NW
Suite 800
Washington, DC 20036

For

United States Senate Finance Committee

Hearing on

Reforming America's Outdated Energy Tax Code
September 17, 2014

NAESCO is the leading national trade association of the energy services industry. During the last twenty years, NAESCO member companies have delivered thousands of energy efficiency, renewable energy, demand response, distributed generation and combined heat and power projects across the United States and around the globe. Nationally, NAESCO member companies have delivered $45 billion in projects that have produced $50 billion in guaranteed and verified energy savings, which repay the cost of the projects and provide positive economic impacts to local communities.

NAESCO supports the Committee's efforts to reform the tax code, and believes comprehensive tax reform must reflect the important relationship between the reduction of energy consumption and tax policy. Of particular importance to NAESCO's members is the continuation of the Section 179D deduction for commercial energy efficient property, which delivers demonstrated and widespread benefits to the U.S. economy.

NAESCO and its members applaud the Committee for including in the *Expiring Provisions Improvement, Reform, and Efficiency Act of 2014 (EXPIRE Act)* an extension of Section 179D, and for the favorable discussion Section 179D received during the Committee's hearing on September 17th. Reducing energy consumption through public policy initiatives, like the 179D tax deduction for efficient lighting, HVAC, and building envelope improvements, is and should remain a critical element of our nation's energy strategy. Tax incentives promoting energy efficiency, such as Section 179D, generate the greatest impact in terms of value to the taxpayer while also meeting other important national policy objectives.

The Section 179D deduction has a demonstrated and widespread benefit to the U.S. economy, provides balance to the tax code, and is a critical tool in advancing our nation's energy conservation and energy security policy goals. Importantly, the deduction is technology neutral which was a key part of the discussion during the Committee's hearing on how future energy incentives should be developed. In addition, it does not reward the taxpayer simply for making an investment; rather, the deduction requires the achievement of verifiable reductions in energy usage. In its rules implementing this section of the code, the Internal Revenue Service requires inspection and testing of the energy efficiency (EE) project by qualified individuals to ensure the project qualifies for the deduction.

Section 179D advances our nation's energy policy priorities in a prudent and cost effective manner. The deduction delivers significant energy savings across the country's building stock by incentivizing greater private sector investment in commercial energy efficient property. Section 179D encourages the acceleration of energy efficient building design and retrofits of inefficient aging buildings, thereby generating deep savings in building energy costs, significantly reducing energy demand, and lowering the emissions of greenhouse gases – all of which benefit the nation's energy security and clean energy priorities. In terms of value, efficiency is a far more cost effective means of meeting energy demand than is the generation of a new unit of energy.

Section 179D serves as an engine of economic growth that generates job creation in a variety of industry sectors and reduces energy usage and costs for businesses. The incremental energy efficiency projects enabled by the availability of Section 179D create and sustain much needed jobs in the construction, engineering, manufacturing and design sectors and reduce the need for investment in new energy supplies and production. In addition, the dollars saved on energy costs by businesses through efficiency improvements can be reinvested in areas that produce greater economic activity.

Repealing the tax incentive for energy efficient commercial property undermines the significant advancements made to date in modernizing our nation's building stock. In fact, the expiration in December of the deduction already has resulted in tremendous uncertainty on the part of commercial building owners, as well as the energy services companies and other industry providers whose businesses are directly tied to developing and implementing efficiency retrofits. Additionally, removing the only incentive that provides accelerated treatment for commercial efficiency property could result in a strong disincentive to invest in efficiency improvements. The tax code allows commercial businesses the ability to immediately deduct money spent on energy consumption (utility bills) as an ordinary and necessary business expense, while without Section 179D the cost of efficiency improvements would be depreciated over many years. This asymmetry in the tax code is successfully addressed through the 179D deduction. Eliminating the 179D provision brings back the economic bias in favor of higher energy costs created by, in many cases, the wasteful use of energy that could have been avoided through the use of energy efficient technologies.

In short, we strongly believe Section 179D should remain a permanent component of a reformed tax code. Importantly, Section 179D compliments the goals of tax reform by delivering economic growth, job creation, and enhanced economic competitiveness. If near-term enactment of comprehensive tax reform is not expected to be forthcoming, we strongly support an immediate, multi-year extension of Section 179D. An extension of Section 179D will provide needed certainty to the commercial and government building markets as well as the energy services company industry, and retain in the tax code the provision directed specifically at stimulating energy savings through investments in efficiency retrofits in the commercial building sector. Any discussion of energy tax policy is incomplete without a robust consideration of energy efficiency, and prudent and effective efficiency incentives – such as Section 179D – belong permanently in a reformed tax code.

Introduction to NAESCO

NAESCO is the leading national trade association of the energy services industry. NAESCO numbers among its members some of the world's leading energy services companies, including: ABM Energy, AECOM Energy, , Ameresco, Burns & McDonnell, CM3 Building Solutions, Clark Energy Group, ClearEnergy Contracting, Climatec, ConEdisonSolutions, Constellation New Energy, Control Technologies and Solutions, CTI Energy Services, , Energy Control Inc, Energy Solutions Professionals, Energy Systems Group, Entegrity, Excel Energy, The Fulcrum Group, Indoor Environmental Services, NextEra Energy Solutions, Honeywell, Johnson Controls, Lockheed Martin, McClure Energy, Navitas, NORESCO, Onsite Energy, Opterra Energy Services, Pepco Energy Services, Performance Services, Schneider Electric, Siemens Industry, Southland Industries, Synergy Companies, Trane, UCONS, and Wendel Energy Services. Utility members include the New York Power Authority, Pacific Gas & Electric, and Southern California Edison.

During the last twenty years, NAESCO member companies have delivered thousands of energy efficiency, renewable energy, demand response, distributed generation and combined heat and power projects across the U.S. as well as around the globe. Nationally, NAESCO member company projects have produced:

- *$45 billion in projects paid from savings*
- *$50 billion in savings – guaranteed and verified*
- *400,000 person-years of direct employment*
- *$30 billion of infrastructure improvements in public facilities*
- *450 million tons of CO2 savings at no additional cost*

Most of these projects are Energy Savings Performance Contracts (ESPC), which don't require new taxes, because they re-purpose the money that a customer is currently spending on wasted energy into a payment stream for the energy-saving capital improvements.

Comments of
The National Association of Manufacturers for the
Record of the
Senate Finance Committee Hearing
"Reforming America's Outdated Energy Tax Code"
September 17, 2014

I. Introduction

The National Association of Manufacturers (NAM) welcomes the opportunity to submit this statement for the record for the Senate Finance Committee Hearing, "Reforming America's Outdated Energy Tax Code" held on September 17, 2014.

The NAM is the largest manufacturing association in the United States, representing manufacturers of all sizes in every industrial sector and in all 50 states. Manufacturing employs nearly 12 million men and women, contributes more than $2.08 trillion to the U.S. economy annually, has the largest economic impact of any major sector and accounts for two-thirds of private-sector research and development.

NAM members know firsthand that our current tax system is fundamentally flawed and discourages economic growth and U.S. competitiveness. As a result of manufacturing's critical importance to our nation's economy, any effort to rewrite the federal tax code should result in a balanced, fiscally responsible plan that allows manufacturers in the United States to prosper, grow and create jobs and also enhances their global competitiveness.

The following comments, which focus specifically on the energy tax provisions in the tax code, reflect NAM Board-approved policy on tax reform and do not reflect the entirety of our views of what is required in a comprehensive tax reform plan.

II. Promoting Investment

One of the most effective ways to spur business investment, particularly in the energy sector—and make U.S. manufacturing more competitive—is through a strong capital-cost recovery system. An ideal system would allow companies to expense capital equipment in the tax year purchased.

The positive economic impact of expensing capital equipment is well recognized. A basic premise of economic theory is that investment is a positive function of an increase in demand and a negative function of cost. The cost of capital to a firm includes three components: the price of capital equipment, the cost of financing the equipment and the tax treatment of investment. Expensing lowers the after-tax cost of capital and increases the number of profitable projects a firm can undertake, helping spur the growth in business investment. The enhanced Section 179 and bonus depreciation provisions

enacted in recent years have temporarily moved us toward an expensing system. Manufacturers believe that, where possible, these policies should be expanded and made a permanent part of any pro-growth tax reform.

Moreover, the fact that increased investment leads to job creation cannot be overemphasized. Indeed, cost recovery is not merely timing. Manufacturers of all sizes take into account the tax impact of cost recovery mechanisms on project cash flows in making investment decisions. For manufacturers large and small, cash flows are carefully managed to support key growth objectives and, especially for small and medium-sized manufacturers, cash flow is critical when access to credit is difficult.

The BEA's release of new quarterly statistics of GDP by industry reinforces the role that a healthy manufacturing sector plays in the health of the nation's economy. Manufacturing in the United States is poised for a comeback, in part due to the recent boom in energy production in the U.S., but for the nation to fully reap the benefit of this resurgence, manufacturers need tax policies that allow them to compete in today's global economy and do not tip the scales against investment.

Manufacturers recognize the important role a favorable tax climate plays in attracting high-value jobs and investment to the United States and improving competitiveness. Consequently, we urge policy makers to advance reforms that encourage investment and job creation in the United States rather than penalize companies struggling to compete in a global economy.

III. Promoting Energy Security

Manufacturers, both energy producers and energy consumers, support policies that will help advance domestic energy production. Indeed, manufacturers support an energy strategy that embraces all forms of domestic energy production while expanding existing conservation and efficiency efforts. Oil, natural gas and clean coal remain essential contributors to our energy security. The U.S. nuclear energy industry is well-positioned to expand its critical role in providing safe, affordable power. Alternative fuels and renewable energy sources like wind energy and solar power will also gain increasing importance in the future.

Developing domestic energy resources, which is critical to energy independence, economic growth and job creation, requires large capital investments in energy production by the private sector. The NAM has long believed that provisions promoting capital investment should be an integral part of comprehensive tax reform, particularly as it relates to investments in developing our nation's energy supplies.

Finding and producing domestic oil and natural gas requires large and continuing capital investments. Drilling oil and gas wells involves a number of costs, including labor, repairs, fuel, chemicals, supplies and other expenses that have no salvage value. Indeed, these costs—known as intangible drilling costs (IDCs)—cover about 70–80 percent of the cost of a shale gas well.

Under longstanding tax policy rules, IDCs are deductible as ordinary and necessary business expenses, reducing the cost of exploring for and producing oil and gas. While

not an incentive, IDCs are an important piece of our cost-recovery system and should be maintained in a reformed tax code.

The development of shale natural gas in the United States has been a "game-changer" for manufacturers and other energy consumers and recent studies by PWC[1] and IHS[2] have confirmed that the development of shale resources has not only enhanced our nation's energy security but also support job creation and economic growth. The NAM believes strongly that tax reform should result in a pro-growth tax code and as such, when considering energy tax policies, policymakers must consider the growth associated with energy production. It is critical that tax reform not undermine the development of these and other new energy sources, removing what is becoming a cost advantage for domestic manufacturers.

The NAM also supports the existing percentage depletion deduction. This long-standing deduction is vitally important to domestic companies producing natural resources including mineral, coal and aggregates and independent oil and gas producers.

Percentage depletion allows taxpayers producing from mines, wells and other natural deposits to claim a deduction for a percentage of the gross income from these properties, recognizing the unique nature of these investments, which require significant financial commitments to long-term projects to deliver a competitive product at a low margin.

The percentage depletion provision also reflects the large risk inherent in these activities and the fact that the value of a mine or well declines as production progresses. Congress created percentage depletion because the otherwise available cost depletion rules resulted in a cost of capital too high to permit producing from important mineral resources. It is important to note also that even with the percentage depletion tax deduction; the U.S. tax burden on mining and other American resources operations puts them at a significant competitive disadvantage.

IV. Promoting Energy Efficiency and Renewable Energy Sources

As major consumers of energy in the United States, manufacturers are committed to reducing our energy intensity and producing more energy-efficient consumer products to help decrease our national overall demand for energy, lower costs and reduce greenhouse gas emissions. Manufacturers have made significant improvements in the efficiency of their own operations by using cost-effective distributed generation, combined heat and power technologies, waste heat recovery systems, water reuse and recycling, intelligent energy systems and advanced manufacturing technology. Similarly, manufacturers embrace every energy resource at our disposal and support the development of renewable energy sources like wind, solar and hydropower.

As is the case with energy security, NAM members believe that a positive tax climate for capital investment in new and existing plants and equipment will help increase industrial

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[1] Available at: http://www.nam.org/~/media/01A2FACA40ED41F3A20FA08FBD6522C0/Shale_Gas_A_renaissance_in_Manufacturing.pdf

[2] Available at http://www.nam.org/~/media/A585A7F78C8D48149777F91D734ABC8D.ashx

energy efficiency and the development of renewable and alternative energy sources in the long run. To that end, the NAM supports favorable capital cost-recovery tax policies.

V. The Domestic Manufacturing Deduction

For energy producers, Section 199—or the Domestic Manufacturing Deduction (DMD) — has the effect of effectively reducing the federal tax rate on income from domestic manufacturing and production activities and helps mitigate their tax burden. By reducing the tax burden on income from U.S. manufacturing activities, the DMD encourages more manufacturing in this country and helps attract needed capital to spur new investment.

This deduction creates a financial incentive to keep production in the United States and influences decisions on where corporations build new production facilities. Since the DMD is directly linked to domestic production, the loss of the DMD would result in higher effective tax rates for many domestic manufacturers, which could outweigh the overarching goal of lower tax rates.

VI. Manufacturers' Opposition to a Carbon Tax

As outlined in our comments above, a strong capital cost-recovery system will encourage energy production and promote energy efficiency and the development of new sources of energy, spurring U.S. economic growth and competitiveness. In contrast, environmental taxes, such as a carbon tax, would impair the ability of U.S.-based producers to compete in the global marketplace. As a method for inducing behavioral changes, penalty taxes increase the cost of production at the expense of economic growth.

An economic study performed for the NAM last year by NERA Economic Consulting[3] on the potential impacts of a carbon tax on the U.S. economy concluded that a carbon tax would have a devastating impact on U.S. jobs, energy costs and industrial output, under two scenarios: a $20 per ton carbon tax increasing at 4 percent and a stricter tax designed to achieve 80 percent reductions in domestic carbon dioxide (CO2) emissions.

According to the NERA report, the increased costs of coal, natural gas and petroleum products due to a carbon tax would ripple throughout the economy, resulting in higher production costs, less spending on non-energy goods, fewer jobs and slower economic growth. Nationally, a carbon tax designed to reduce CO2 levels by 80 percent could place tens of millions of jobs at risk and raise gasoline prices by over $10 a gallon, natural gas prices by almost $60 per MMBtu and residential electricity prices by over 40 percent.

NERA also found that a carbon tax it modeled would have a negative impact on manufacturing output. In energy-intensive sectors, manufacturing output could drop by as much as 15.0 percent and in non-energy-intensive sectors by as much as 7.7 percent. The overall impact on jobs would be substantial, with a loss of worker income

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[3] Available at http://www.nam.org/Issues/Energy-and-Climate/Carbon-Tax.aspx

equivalent to between 1.3 million and 1.5 million jobs in 2013 and between 3.8 million and 21 million jobs by 2053.

NAM members continue to develop and implement measures that use energy more efficiently, utilize alternative sources of energy and develop new technologies leading to fewer GHG emissions. Through innovation, manufacturers have led a quantum shift in energy production in this country that, along with the potential to create millions of new jobs, will help lead to a sustainable future for generations to come.

VII. Conclusion

The NAM recognizes the need to promote domestic energy production, promote energy efficiency and develop renewable sources of energy, and the important role a favorable tax climate plays in achieving these goals. Consequently, we urge policymakers to advance reforms that encourage investment in these critical areas through a strong capital cost-recovery system.

On a broader note, any changes to energy tax provisions should be addressed in the context of comprehensive tax reform. Given that all the components of a comprehensive tax reform package have yet to be determined, the comments above are based on the premise that any changes to our energy tax provisions would be part of a comprehensive tax reform plan.

As essential as comprehensive tax reform is to the long-term competitiveness of our nation, a new system must not result in a net increase in manufacturers' tax burden—a change that would derail efforts to enhance U.S. economic growth, investment, competitiveness and jobs.

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National Biodiesel Board
Statement to the Senate Finance Committee
Hearing on Reforming America's Outdated Energy Tax Code
Sept. 17, 2014

Introduction

Chairman Wyden and Ranking Member Hatch, I appreciate the opportunity to submit a written statement on behalf of the National Biodiesel Board (NBB) for the record of the Committee's hearing titled, "Reforming America's Outdated Energy Tax Code."

In its short history, the biodiesel tax incentive has proven to be a remarkably effective tool in helping to achieve the desired goal of increasing the domestic production and use of biodiesel and renewable diesel. This in turn is enabling the U.S. to realize the energy security, economic and environmental benefits associated with displacing petroleum with clean, domestically produced renewable fuels. We appreciate and support your efforts to explore a more stable, long-term structure for renewable fuels incentives in the tax code. However, for the near-term, we want to emphasize the urgent threat facing our industry from the ongoing expiration of the biodiesel tax incentive since Jan. 1, 2014. This year marks the third time in five years that the biodiesel incentive has been allowed to lapse, creating severe disruptions in the industry. Biodiesel producers across the country are struggling to survive. We urge Congress to act in a timely manner to address the immediate issue facing the industry by extending the biodiesel tax incentive. We also encourage the committee to explore the compelling public benefits of revising the biodiesel tax incentive as a production excise tax incentive. Looking forward, to provide certainty and improve the incentive, we urge Congress to provide a long-term extension of the reformed incentive consistent with the recommendations NBB provided to the Committee earlier this year in response to the "Staff Discussion Draft to Reform Certain Energy Tax Provisions" (a copy of which is attached).

Executive Summary:

The biodiesel tax incentive, which was enacted into law in 2004 and took effect on January 1, 2005, has played an instrumental role in stimulating the commercialization of the U.S. biodiesel industry. The incentive has helped biodiesel grow from a niche fuel less than a decade ago into a commercial-scale industry with refineries in nearly every state in the country. Last year, the industry produced a record of nearly 1.8 billion gallons of clean, renewable fuel, supporting more than 62,200 jobs. In 2004, before the tax credit was enacted, our industry produced 25 million gallons. Biodiesel's emergence as a new American energy industry is a success story. Yet biodiesel still makes up a small fraction of the growing 60 billion gallon diesel fuel pool in the U.S., and the industry remains at a young and vulnerable stage of

development. Like other capital-intensive energy industries before it, the industry needs policy support in the early stages to continue growing and maturing. Specific to tax policy, the industry's growth has been handicapped by the "off-again, on-again" cycle of expiration and retroactive extension of the credit. The credit has expired three times in the past five years – in 2010, 2012 and again in 2014 – each time severely disrupting the industry and reducing production. NBB welcomes congressional discussion of a next-generation energy tax framework designed to provide certainty to plant operators, investors, feedstock producers, blenders and consumers. However, until the Senate and House can complete their deliberations on this topic, NBB strongly urges Congress to promptly extend the biodiesel tax credit that expired at the end of 2013.

About NBB

NBB is the national trade association representing the biodiesel industry as the coordinating body for research and development in the United States. It was founded in 1992, and since that time, NBB has developed into a comprehensive industry association representing producers; feedstock organizations; fuel marketers and distributors; technology providers and other related businesses. In 2013, NBB also began representing renewable diesel, a similar diesel alternative that is made with the same feedstocks, is blended with diesel fuel but uses a different processing technology.

Biodiesel Background and Industry Overview

Biodiesel, renewable diesel, and renewable aviation fuels are renewable, low-carbon diesel and jet fuel replacements. The EPA has determined, based on the lifecycle and greenhouse gas emissions requirements established under the Energy Independence and Security Act (EISA) (P.L. 110-140), that these fuels qualify as Advanced Biofuels under the Renewable Fuel Standard (RFS) – in that when compared to petroleum diesel, biodiesel, renewable diesel and renewable aviation fuels reduce greenhouse gas emissions by more than 50 percent. In fact, biodiesel is the only commercial-scale fuel produced and sold across the United States to achieve this designation.

Biodiesel is made from a wide variety of feedstocks including recycled cooking oil, animal fats, and plant oils, and they are refined to meet a specific commercial fuel definition and specification. Biodiesel 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 200 biodiesel plants registered with the EPA, representing a combined production capacity in excess of 3 billion gallons.

Biodiesel is primarily marketed for use in highway transportation fuel as a five percent (B5) blending component with conventional diesel fuel, but it can be used in higher concentrations. Most major engine companies have stated formally that they support the use of blends up to 20 percent biodiesel

(B20). Biodiesel is distributed utilizing the existing fuel distribution infrastructure with blending occurring both at fuel terminals and "below the rack" by fuel jobbers.

Renewable diesel is made from the same feedstocks using a different technology. When used in transportation fuel it is required to meet the same specifications as petroleum diesel, which is ASTM D975.

Overview of (currently expired) Law Affecting Biodiesel:

The biodiesel tax incentive was first enacted into law in 2004 as part of the American Jobs Creation Act (P.L. 108-m357) and took effect on Jan. 1, 2005. The incentive was subsequently modified and 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 incentives for one year through December 31, 2009, at which time the credit expired. After a lapsed period of one year in 2010, the tax credits were subsequently retroactively extended through December 31, 2011 by Public Law 111-312. The incentive lapsed again in 2012 and was retroactively extended on January 2, 2013 through Dec. 31, 2013 in the American Taxpayer Relief Act (P.L. 112-240). It is currently expired, *for the third time in five years*. However, the EXPIRE Act, as approved by the Finance Committee on April 8, 2014, would extend the credit through December 31, 2015. However, the EXPIRE Act, as approved by the Finance Committee on April 8, 2014, would extend the credit through December 31, 2015.

The biodiesel tax incentive is designed to encourage the production and use of biodiesel by making the fuel more price-competitive with conventional diesel fuel. In general, the 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. The tax credit is taken by the blender of the fuel (the point where biodiesel is blended with petroleum diesel). 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 fuels. The credit is the sum of three credits – the biodiesel mixture credit (blenders' credit); the biodiesel credit (general business credit); and the small agri-biodiesel producer credit. The biodiesel mixture or blenders' credit provides a $1.00 per gallon tax credit for each gallon of biodiesel that is blended with conventional diesel fuel. The biodiesel credit or general business credit provides a $1.00 per gallon for each gallon of pure B100 biodiesel that is used as a fuel. A taxpayer can take one of these first two credits, not both. The small agri-biodiesel producer credit is a credit of $0.10 per gallon for fuel produced at facilities having a production capacity of less than 60 million gallons per year. The small agri-biodiesel producer tax credit may only be claimed on the first 15 million gallons of a taxpayer's production.

The tax incentives available to renewable diesel producers and blenders are generally similar to those available to biodiesel. Eligible fuels must be derived from biomass and meet registration requirements

of section 211 of the Clean Air Act. Also like biodiesel, the $1.00 per gallon renewable diesel tax incentive can be taken in the form of an income tax credit, an excise tax credit, or as a payment from the Treasury. Technology-specific rules focused specifically on renewable diesel in the Code include different ASTM standards (ASTM D975 or D396). Also, there is no small producer credit associated with renewable diesel.

Public Benefits Associated with Biodiesel and Renewable Diesel Production and Use

- **Creating Jobs and Economic Activity:** According to a recent study, the biodiesel industry supported more than 62,200 jobs last year, along with $2.6 billion in wages and nearly $17 billion in total economic activity. The industry has commercial-scale plants in nearly every state in the country.

- **Strengthening our Energy Security**: The biodiesel industry is increasing domestic energy production, diversifying our fuel supplies and expanding domestic refining capacity so that we're not so vulnerable to global oil markets and associated refining bottlenecks. Regardless of how much oil we discover domestically, American consumers will continue to be vulnerable to heavily manipulated global petroleum prices until we have diversity and competition in the market. Biodiesel is a practical, cost-effective alternative that is produced today on a commercial scale, giving consumers real choice in the diesel fuel market.

- **Improving our Economic Security:** Because fuel prices affect all sectors of the economy, the harmful impacts of our petroleum dependence are real, not just for consumers but also for the U.S. Treasury due to reduced economic growth and the resulting decrease in tax revenues. A recent study from the American Enterprise Institute found that the U.S. debt between 2003 and 2012 would have been $1.2 trillion lower if oil prices had increased at the same rate as other goods. Instead, oil prices quadrupled, acting as a drag on economic growth and tax revenues.

- **Reducing Harmful and Costly Emissions:** The EPA has determined that biodiesel reduces lifecycle greenhouse gas emissions by 57 percent to 86 percent compared to petroleum diesel. With nearly 6.5 billion gallons used from 2005 to 2013, biodiesel has reduced lifecycle greenhouse gas emissions by 58 million metric tons – the same impact as removing some 12 million passenger vehicles from America's roadways. Additionally, the EPA consistently cites tailpipe emissions from traditional diesel – primarily from older trucking fleets and other heavy-duty vehicles – as a major national health hazard. Substituting higher amounts of biodiesel for traditional diesel fuel is the simplest, most effective way to immediately reduce harmful diesel emissions such as particulate matter.

- **Stimulating New Technologies and Feedstocks:** Biodiesel is one of the most diverse fuels in the world, produced using a broad mix of resources including recycled cooking oil, plant oils and animal fats. This has helped shape a nimble industry that is constantly searching for new technologies and feedstocks. Industry demand for new production methods is stimulating, and often financing, research on new feedstocks such as algae and camelina.

- **Immature Industries are Deserving of Assistance:** Biodiesel is America's first Advanced Biofuel and when compared to gasoline, diesel and ethanol, it is at a fundamentally different stage of development. The petroleum industry has benefited from numerous tax deductions and other

tax benefits over the years and continues to receive approximately $4 billion in tax benefits each year; while the ethanol industry had a tax incentive for three decades before it expired several years ago. In contrast, the biodiesel industry has had commercial-scale production for only about seven years, and has had its tax credit only since 2005. Biodiesel still represents only a fraction of the overall U.S. diesel market. It is an up-and-coming industry that remains at a far more fragile state of development.

Conclusion

Since its enactment, the biodiesel tax incentive has helped the U.S. achieve the desired goal of increasing 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. NBB applauds the Finance Committee's efforts to establish a stable long-term energy tax program, and urges the Members to ensure that any new regime recognizes biodiesel's unique public contributions within a technology-neutral and performance-based mechanism. Until fundamental tax reform can be enacted, NBB urges Congress to reinstate the biodiesel incentive without delay.

ATTACHMENT A
Comments to the Senate Finance Committee – Jan. 31, 2014
"Staff Discussion Draft to Reform Certain Energy Tax Provisions"

Introduction

Chairman Baucus and Ranking Member Hatch, I appreciate the opportunity to submit written comments on behalf of the National Biodiesel Board (NBB) in response to the December publication of the Committee's "Staff Discussion Draft to Reform Certain Energy Tax Provisions."

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. We appreciate and support your efforts to explore a more stable, long-term structure for renewable fuels incentives, and have provided comments herein. However, for the near-term, we want to emphasize that the progress our industry has made will be threatened if Congress does not act in a timely manner to address the immediate issue facing the industry and retroactively extend the biodiesel tax incentive. Looking forward, to provide certainty and improve the incentive, we urge Congress to reform the biodiesel tax incentive as a production excise tax incentive and provide a ten-year extension of the reformed incentive consistent with our proposed modifications herein regarding the Committee's "Staff Discussion Draft to Reform Certain Energy Tax Provisions."

Executive Summary:

The biodiesel tax incentive, which was enacted into law in 2004 but did not take effect until January 1, 2005, has played an instrumental role in stimulating the commercialization of the U.S. biodiesel industry. The incentive has helped biodiesel grow from a niche fuel less than a decade ago into a commercial-scale industry with refineries in nearly every state in the country. Last year, the industry produced a record of nearly 1.8 billion gallons of clean, renewable fuel, supporting more than 62,200 jobs nationwide. In 2004, before the tax credit was enacted, our industry produced 25 million gallons. Biodiesel's emergence as a new American energy industry is a success story. Yet biodiesel is still a small fraction of the growing 60 billion gallon diesel fuel pool in the U.S., and the industry remains at a young and vulnerable stage of development. Specific to tax policy, the industry's growth has been handicapped by the "off-again, on-again" cycles of expiration and retroactive extension of the credit. The credit has expired three times in the past five years – in 2010, 2012 and again in 2014 – each time severely disrupting the industry and reducing production. NBB welcomes congressional discussion of a next-generation energy tax framework designed to provide certainty to plant operators, investors, feedstock producers, blenders and consumers. Also, NBB is pleased to provide comments regarding possible modernizations of the credit that can make it more cost-effective while streamlining its oversight and administration by the IRS. However, until the Senate and House can complete their deliberations on this topic, NBB strongly urges the Committee to promptly extend the biodiesel tax credit that expired at the

end of 2013 and applies when biodiesel, renewable diesel or renewable aviation fuel is blended with a taxable fuel (diesel fuel or aviation fuel).

About NBB

NBB is the national trade association representing the biodiesel industry as the coordinating body for research and development in the United States. It was founded in 1992, and since that time, NBB has developed into a comprehensive industry association representing producers; feedstock organizations; fuel marketers and distributors; technology providers and other related businesses. In 2013, NBB also began representing renewable diesel, a similar diesel alternative that is made with the same feedstocks, is blended with diesel fuel but uses a different processing technology.

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Biodiesel is primarily marketed for use in highway transportation fuel as a five percent (B5) blending component with conventional diesel fuel, but it can be used in higher concentrations. Most major engine companies have stated formally that they support the use of blends up to 20 percent biodiesel (B20). Biodiesel is distributed utilizing the existing fuel distribution infrastructure with blending occurring both at fuel terminals and "below the rack" by fuel jobbers.

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Public Benefits Associated with Biodiesel and Renewable Diesel Production and Use

- **Creating Jobs and Economic Activity:** According to a recent study, the biodiesel industry is supporting more than 62,200 jobs nationwide, along with $2.6 billion in wages and nearly $17 billion in total economic activity. The industry has commercial-scale plants in nearly every state in the country.

- **Strengthening our Energy Security**: The biodiesel industry is increasing domestic energy production, diversifying our fuel supplies and expanding domestic refining capacity so that we're not so vulnerable to global oil markets and associated refining bottlenecks. Regardless of how much oil we discover domestically, American consumers will continue to be vulnerable to heavily manipulated global petroleum prices until we have diversity in the market. Biodiesel is a practical, cost-effective alternative that is produced today on a commercial scale, giving consumers real choice in the diesel fuel market.

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- **Reducing Harmful and Costly Emissions:** The EPA has determined that biodiesel reduces lifecycle greenhouse gas emissions by 57 percent to 86 percent compared to petroleum diesel. With some 5.3 billion gallons used from 2005 to 2012, biodiesel has reduced lifecycle greenhouse gas emissions by 85.6 billion pounds – the same impact as removing 6.2 million passenger vehicles from America's roadways. Additionally, the EPA consistently cites tailpipe emissions from traditional diesel – primarily from older trucking fleets and other heavy-duty vehicles – as a major national health hazard. Substituting higher amounts of biodiesel for traditional diesel fuel is the simplest, most effective way to immediately reduce diesel emissions.

- **Stimulating New Technologies and Feedstocks**: Biodiesel is one of the most diverse fuels in the world, produced using a broad mix of resources including recycled cooking oil, agricultural oils and animal fats. This has helped shape a nimble industry that is constantly searching for new technologies and feedstocks. Industry demand for new production methods is stimulating, and often financing, research on new feedstocks such as algae and camelina.

- **Immature Industries are Deserving of Assistance:** Biodiesel is America's first Advanced Biofuel and when compared to gasoline, diesel and ethanol, it is at a fundamentally different stage of development. The petroleum industry has benefited from numerous tax deductions and other tax benefits over the years and continues to receive approximately $4 billion in tax benefits each year; while the ethanol industry had a tax incentive for three decades before it expired several years ago. In contrast, the biodiesel industry has had commercial-scale production for only about seven years, and has had its tax credit only since 2005. Biodiesel still represents only a fraction of the overall U.S. diesel market. It is an up-and-coming industry and is a far more fragile state of development.

Importance of Predictability:

NBB applauds the Staff Discussion Draft's approach in creating a durable mechanism that we believe would be effective for at least ten years and would not be dependent on annual legislative extensions. This long-term program, if written so it would ensure that biodiesel facilities remain eligible, could provide the stability the industry needs to continue to grow and would assist in the ongoing transition of adding new, much-needed infrastructure. Without the ten-year program, and under the starts and stops of current law with every cycle of extension and expiration, instability is injected into the biofuel marketplace that disrupts the ability of producers, blenders and marketers to engage in long-term contracts. This often prevents businesses in the sector from hiring and expanding operations. In many instances, NBB members have been forced to decide between forgoing opportunities to sell fuel or to bet on an upcoming retroactive extension by selling at a price that would be below-market in the absence of the tax credit.

Any Changes to the Incentives Should Evolve Towards a Production Credit Mechanism:

NBB is supportive of the Staff Draft's transition from a blenders' credit to a production tax credit (PTC) mechanism for biodiesel and renewable diesel. Blenders' tax credits have played an important role in evolution of the industry, but in the period since they were enacted, the industry, the IRS, and many Members of Congress have grown concerned about the blenders' credit mechanism that allows for so many potential credit claimants. As the community of individuals potentially eligible to claim the blender credit grows, the ability of the IRS to identify ineligible credit claims declines, potentially allowing for abuses that deprive the Treasury of revenue and generate negative publicity casting renewable energy policies in a bad light. NBB believes that transitioning to a production tax credit, with narrow exceptions crafted for bona fide blenders, would significantly reduce the number of registered businesses that the Service is required to police, thereby streamlining the administration of the credit and maximizing compliance. Additionally, from a fiscal policy perspective many Members have questioned the energy and economic rationale for providing tax support for biodiesel produced overseas, as the current blenders credit structure does. In an era of high federal budget deficits and ever-increasing concern regarding the revenue cost of renewable energy tax benefits, NBB believes that

the responsible approach to modernizing the biodiesel tax incentives would be to limit them to domestic production, which can only be done within the bounds of our international trade obligations by converting the incentives to a production tax credit. This would provide significant savings to the U.S. Treasury while further focusing the incentive on domestic production.

Staff Draft Should Encompass Existing and New Biodiesel Facilities:

NBB encourages the Members to clarify the draft with regard to the formula used to determine eligibility to participate in the fuel incentives. The committee should unambiguously make each biodiesel production facility eligible to obtain a ten-year stream of biofuel production credits from date of enactment, rather than attempting to find some way of calculating the credit eligibility period based upon the date the facility was originally placed in service. Without this clarification, the new biofuel tax incentives will lead to competitive instability by creating winners and losers among the existing fleet of domestic biofuel production facilities.

BTU energy density factor:

The Staff Draft incorporates a British Thermal Unit (BTU) standard for biofuels. Fuels vary widely in energy content, and it is important for this to be factored into a new tax structure. Diesel fuel generally delivers significantly higher energy content than gasoline, providing consumers with additional value per gallon. The BTU[1] of biodiesel, renewable diesel and renewable aviation fuel is very similar to that of petroleum diesel.

However, in accounting for BTU content, we would encourage Members to develop a tiered system in which fuels are grouped in general ranges, instead of attempting to develop unique scores for each of the many fuels produced today. There are a number of variables at play in addition to BTU that affect a fuel's efficiency and mileage performance, and attempting to measure all of those factors for each of the dozens of fuels available in today's market could make the program unnecessarily cumbersome and difficult to administer.

Biodiesel blends of B5 (5 percent biodiesel) and B20 (20 percent biodiesel) have nearly the same BTU content as petroleum diesel. Additionally, in the real world, we see that biodiesel burns more efficiently and combusts more efficiently than does petroleum diesel.

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[1] Petroleum diesel:
The average BTU/gal for petroleum based diesel fuel is 129,500.

Biodiesel :
The average BTU value for biodiesel is approximately 118,296 BTU/gal.

In June, 2013, the Diesel Technology Forum released a study completed by MARTEC on the benefits of "Light Duty Diesel Engine Benefits in the United States." When analyzing the use of B5 and B20 biodiesel blends in light duty diesel engines driving 15,000 miles each year, as part of their analysis they concluded the following:

- *If all new light-duty diesel vehicles are fueled with B5 biodiesel, the US will save an additional 150-300M gallons as compared to diesel fuel alone.*

- *If all new light-duty diesel vehicles are fueled with B20 biodiesel, the US will save an additional 600M-1.1B gallons as compared to diesel fuel alone.*

Biodiesel produces less unburned hydrocarbons in the exhaust stream, because it converts a greater ratio of the contained hydrocarbons to useable work. Petroleum diesel starts with more potential energy in each gallon, but loses more to pollution. Additionally, new clean diesels are clean not because the engines produced lees pollution, but because the exhaust systems treat this pollution before it leaves the tailpipe. This treatment requires greater energy input then older diesel engines.

Attempting to capture all of these variables in unique scores for each individual fuel would be extremely complex.

Environmental Performance Criteria Can Be Made More Practical:

The Staff Draft incorporates environmental performance criteria into the calculation of the amount of the proposed production tax credits and the proposed investment tax credit (ITC). NBB strongly agrees with the notion that federal tax incentives for renewable and alternative fuels should be targeted at those fuels that have the potential to make significant contributions to the state of the environment. However, the potential increased environmental benefits derived from requiring PTC and ITC determinations to include feedstock validation may create such significant compliance burdens that they may undermine the ability to administer the entire program.

For background purposes it is necessary to understand the many different types of feedstock that could be ultimately used in a biodiesel or renewable diesel production facility.

1. RFS-qualifying vegetable oils and fats: soybean oil, canola/rapeseed oil, animal fats, inedible corn oil from distillers dried grains (DDG), waste greases, and camelina oil.

2. RFS non-qualifying vegetable oils and fats: sunflower seed oil, cottonseed oil, edible corn oil (not from dried distillers grains or DDG), palm oil, palm kernel oil, coconut oil, jatropha oil, castor oil, and likely many other oils.]

We recommend that RFS-qualifying feedstocks be eligible for the tax credit at $1.00 per gallon. Additionally, we recommend that RFS non-qualifying feedstocks not be eligible for any tax credits.

EPA has already made the determination that the qualifying feedstocks reduce greenhouse gas emissions by at least 50% when compared to petroleum diesel. Once a feedstock is approved by EPA it should be added to the qualifying list for tax purposes. Furthermore, after feedstocks have been approved by EPA, biodiesel and renewable diesel companies don't distinguish between feedstocks as they process them into finished fuels. For example canola oil, yellow grease and animal fats will likely be comingled at the production facility in order to gain the greatest cost efficiency and give producers an opportunity to blend the highest quality fuel. If each feedstock received a different tax credit based upon their environmental performance, then the business of producing renewable fuels from diversified feedstocks would be significantly frustrated, as feedstocks could never be comingled. This would decrease production volumes and efficiencies and decrease the ability of biodiesel facilities to comingle feedstocks based on the quality demands of the fuels marketplace.

For instance, according to NBB's reading of the Staff Draft, the ITC that a developer could claim on a new advanced biofuel facility would be calculated based upon the proposed energy content and environmental performance of the fuel that would be produced at the facility after it was built. While biodiesel facilities are capable of operating on different feedstocks as dictated by commodity values and client preferences, the calculation of the ITC before the facility is even built would require the producer to commit to a feedstock in order to be able to calculate the environmental performance of the fuel. In such a scenario, it is not difficult to envision a situation in which the operator is compelled in the future to use a different feedstock than that vouched for to receive the ITC. If a slightly less environmentally beneficial feedstock would be utilized, this could create grounds for the Service to pursue the producer for disgorgement of part of the ITC. Conversely, if a more environmentally beneficial feedstock were to be used, the producer may be encouraged to try to refile his previous return to claim the excess ITC amount he is now due.

Administration of a PTC, while perhaps less hopelessly complex than the ITC above, could also prove challenging. Producers, blenders and IRS officials already experience tremendous difficulty attempting to navigate a system that requires that each gallon be a bona fide advanced biofuel as defined under Section 211 of the Clean Air Act, and also meet ASTM specification D6751. If yet another layer of complexity were to be added wherein documentation would be required for each gallon of fuel not only meeting the minimum standards for the highway-quality fuel, but also indicating potentially different tax credit amounts depending upon which feedstock were to be used in each batch of fuel at the same plant, NBB is concerned that the paperwork and liability for compliance could become unmanageable, and that the program could become very difficult for the IRS to administer.

For these reasons, NBB suggests that the Staff Draft mechanism be simplified to acknowledge the environmental benefits provided by clean fuels, while still keeping the compliance requirements within manageable parameters both for the producers and for the IRS. One possible solution is for RFS-qualifying feedstocks be eligible for the tax credit at $1.00 per gallon. Biodiesel from various feedstocks (as long as it is a qualifying feedstock under the RFS would be eligible for the credit and producers could manufacture and blend batches as necessary to satisfy the marketplace without threatening to upend an ITC claim that had already been made, or keep voluminous new paper trails on gallons of fuel that were eligible for the PTC.

Additionally, any certification of environmental performance by the EPA should be designed to use currently available data, rather than require a new rulemaking or administrative procedure. If a protracted EPA undertaking is required for the various technologies to obtain eligibility for federal tax incentives, the years of uncertainty attendant to such a process could undermine the public's confidence in the future availability of the tax credits.

Direct Payments Constitute an Important Aspect of the Current Credit Structure:

NBB notes that the Draft proposes a dramatic departure from current law in failing to offer biodiesel producers the election, available under the law that expired on December 31 of 2013, to take the credit as either an income tax credit, an excise tax credit, or as a payment from the Treasury. NBB can confidently state that this choice is a critical component of the commercialization of the industry. As proposed in the Staff Draft, the direct payment option would effectively be repealed, leading to decreased sales and production of biodiesel; decreased economic activity and employment in the sector; a spike in the price of biodiesel to consumers, and increased GHG emissions from the proportional decrease in biodiesel usage .

To understand why the ability to obtain direct payments of the tax credits is critical to the proper functioning of the biodiesel marketplace, it is important to know that, over time, most of the producers have availed themselves of the option to participate as both the producer and the blender (making themselves eligible to obtain the credit by blending 0.1 % diesel into the neat biodiesel at the plant).

Starting a biodiesel refinery is a large-scale endeavor that typically requires significant capital investment and debt, particularly in the early going. Recent surveys of these producers reveal that for the most part, both small and large producers are fortunate to break even or make a small profit on any given tax year, and because of the need to absorb previous losses, many are consistently posting federal tax losses. While the biodiesel credit can be taken by these producers as an excise tax credit, the ratio of the value of the blenders credit vs. the rate of federal tax on the biodiesel dictates that even after resolving their federal excise tax liability, the producers often have excess tax credits. From 2005 through last year, producers have overcome this challenge of having excess credits by applying to the Treasury for a direct payment of the credits' value, which must be remitted to them in a timely fashion.

Thus, under the current regime, the producer is virtually certain of obtaining the face value of the refundable tax credits in almost real time. The purchasers are certainly aware of this amount and most of the purchase contracts entered into for the sale of biodiesel contemplate the receipt of the value of the credits by the producer and adjust the sale price of the biodiesel accordingly. The net result is that the biodiesel tax incentives largely function as Congress intended: the market accounts for the amount of the tax credit as a tool to reduce the selling price of the product to make it price-competitive with the petroleum diesel. The public benefits from direct payments in two ways: one, for the fuel sales that are motivated by petroleum companies' need to comply with the Renewable Fuel Standard, the price of the fuel at the pump is lowered, and two, once the obligated parties have fulfilled their legal requirement to purchase biodiesel, the lower price leads to additional blending that would not occur otherwise.

If the Staff Draft were to be enacted as written, the effect on the biodiesel industry would be immediate and significant. Biodiesel producers would continue to be eligible to obtain federal tax incentives for their products, however the incentives would be provided in a form that would be partially or wholly unusable by the producers, at least in the near term. Unlike many other sectors of the advanced biofuel community, it is extremely unusual for a biodiesel producer to be established as a joint venture with an integrated traditional energy company; for this reason biodiesel producers do not generally have a well-funded partner (with an appetite for income tax credits) with whom to syndicate the value of nonrefundable income tax production credits. Thus, while the ability to continue to obtain federal tax credits is not in doubt under the Staff Draft, the ability of the industry to utilize the credits and thus pass on the value of the credits to consumers and to motivate oil companies to purchase the fuel may be severely degraded.

If the Staff Draft were to be enacted, the biodiesel producers would face the quandary of establishing a market value of their fuel in negotiations with buyers, without having any confidence in their ability to monetize the tax credits. Under the rules of IRC section 39, taxpayers are allowed to carry forward unused tax credits for as many as 20 years. While this mechanism can provide comfort to taxpayers who expect to generate federal taxable income in the near future, NBB fears that biodiesel producers will end up with an ever increasing amount of excess nonrefundable income tax credits. Without hope of obtaining the value of the credits, biodiesel producers will be forced to sell their product at a price that doesn't reflect the credits, resulting in a significant increase in the cost of the fuel at the pump, and certainly removing any incentive for oil companies to blend biodiesel in amounts exceeding their RFS obligations.

From a policy viewpoint, biodiesel only provides its many economic and environmental benefits, and lives up to Congressional expectations, if it is widely blended into the diesel pool and well received by the fuels infrastructure and the retail consumers. Removing direct payments from the function of the biodiesel tax incentives would unavoidably thwart congressional intent and lead to price spikes and disharmony in the fuels sector.

The Committee is Correct to Link Credit Eligibility to Maintaining High Fuel Quality:

Current (expired) law prescribes varying biofuel quality standards on a technology-specific basis. For example, in 2013, for biodiesel fuels to be eligible for tax incentives, they were required to meet ASTM standard D6751. The effect of this requirement is to limit biodiesel tax credit eligibility to biodiesel fuels that can safely be used as highway transportation motor fuels year round. NBB supports requirements that link tax credit eligibility for full credit to meeting established ASTM specifications. These common-sense rules prevent waste of taxpayers' dollars on low value fuels while protecting consumers by discouraging unethical producers from attempting to place sub-par fuels into the retail marketplace.

However, there is a difference between limiting tax credit eligibility to highway transportation quality motor fuels, and limiting eligibility to only fuel that is ultimately used in highway transportation vehicles. In recent years, market conditions and fuel stocks allowed producers to sell domestically produced

(ASTM D6751 compliant) biodiesel into markets other than highway transportation. For example, for environmental and other reasons, there is significant demand, particularly in the Northeast region, for blending biodiesel with traditional home heating oil. Under prior tax incentive structure, that highway-quality fuel was eligible for federal tax incentives even when used as heating oil. Given the growing market demand in this sector, NBB suggests that such flexibility be retained in any next draft of the committee's staff proposal.

Conclusion

Since its enactment, the biodiesel tax incentive has helped the U.S. achieve the desired goal of increasing 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. NBB applauds the Finance Committee's efforts to establish a stable long-term energy tax program, and urges the Members to ensure that any new regime recognizes biodiesel's unique public contributions within a technology-neutral and performance-based mechanism. Until fundamental tax reform can be enacted, NBB urges the Members to approve a seamless extension of the current rules without delay.

National Rural Electric Cooperative Association
A Touchstone Energy® Cooperative

Written Testimony
On behalf of the
National Rural Electric Cooperative Association

Submitted to the
United States Senate Committee on Finance

Reforming America's Outdated Energy Tax Code
September 30, 2014

Background

NRECA is the national service organization for more than 900 not-for-profit rural electric utilities that provide electric energy to over 42 million people in 47 states or 12 percent of electric customers. NRECA members include 65 generation and transmission (G&T) cooperatives, which generate and transmit power to over 800 distribution cooperatives. Our G&T members generate approximately 50 percent of the electric energy they sell and purchase the remaining 50 percent from non-NRECA members. The vast majority of NRECA members are not-for profit, consumer-owned cooperatives. Both distribution and G&T cooperatives were formed to provide **reliable** electric service to their owner-members at the **lowest reasonable cost**.

Most of the electric cooperatives are exempt from federal income taxation under Internal Revenue Code section 501(c)(12)(A). Electric cooperatives must generate 85 percent or more of their gross receipts from members for the sole purpose of meeting losses and expenses in order to maintain their exempt status. Electric cooperatives like other cooperatives utilize three principles fundamental to cooperative operation: subordination of capital, democratic control and ownership by the members, and operation at cost accomplished by returning net margins to the members on the basis of their patronage with the cooperative. However, a tax exempt electric cooperative must pay tax on its unrelated business taxable income, which is derived from business transactions that are not substantially related to the cooperative's exempt purpose. Because electric cooperatives are owned by those they serve, there are no third party shareholders to bear part of the costs associated with changes in national energy policy. Electric cooperatives service territories include some of the most rural and impoverished areas of the United States, and, as a result, our members bear a disproportionate share of any cost increases which may occur in the electric utility sector of the economy..

Tax Policy Considerations

As Congress considers legislation to address the energy tax code or a tax extenders bill, we agree with others that short-term temporary fixes are not the answer. Long term sound tax policy is needed to increase business certainty and encourage economic expansion.

Renewable (PTC – ITC) Tax Credits

The Production Tax Credit (PTC) and the Investment Tax Credit (ITC) for renewable energy generation investment in wind and solar allows an income tax liability to be reduced by a tax credit and therefore the current structure of the PTC effectively does not work for not-for-profit entities such as electric cooperatives.

If renewable tax incentives are extended or enacted in the future, an equitable policy should be developed which would provide some alternative form of assistance to tax-exempt entities such as electric cooperatives. Any technology-neutral policy considered for domestic production of clean electricity that moves forward which provides tax incentives should include alternative provisions that will help tax-exempt electric cooperatives embrace and implement those new technologies without placing disproportionate costs on our member-owners.

Nuclear Tax Credit

Because of the massive amount of investment that is needed to finance the construction of new nuclear power plants, projects now and in the future are being developed and constructed by partnerships that include investor-owned companies, electric cooperatives and public power systems. These new nuclear plants can help to reduce the electric power industry's carbon emissions, achieve clean reliable energy, provide needed base load generation (24/7) electricity and create thousands of new jobs during construction and operation.

Under current law, the nuclear PTC is allocated to facilities on a pro-rata basis, and shared among the joint venture parties in those facilities. Tax credits allocated to electric cooperatives, however, cannot be used either because the electric cooperative is tax exempt or because it does not have sufficient taxable income to utilities the credit. This situation results in a disproportionate net cost among the joint venture participants. The solution is to allow the not-for-profit cooperative to assign its proportionate share of any credit to their joint venture taxable entities that are involved in the project.

Although there is certainly a cost associated with amending the PTC to include nuclear, the benefits of expanding the nuclear production tax credit will create energy independence, energy generation research and technology development.

Depreciation Expenses and Research and Development Credits

We support extending and making permanent the provision under Section 179 which would allow the current expensing of items which would otherwise have to be capitalized and depreciated. We support the annual cap associated with the Section 179 election of $500,000. This provision incentivizes demand for physical goods and allows for the immediately expensing of otherwise depreciable assets. Furthermore, we recommend that the 50 percent bonus depreciation for the purchase of new capital assets be made permanent.

Although not-for profit, member -owned cooperatives are not directly eligible for Research and Development Tax Credit we support making permanent the research and development credit which was first adopted in 1981. The R & D tax credit can play a critical role in creating storage of renewable energy on the grid. Electricity is the essence of modern civilization. Creating a viable storage mechanism for electricity will enable the full utilization of intermittent renewable assets such as wind. The more efficient we can become, the more value we will create for all American consumers.

REMA
Renewable Energy Markets Association

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October 1, 2014

Senate Committee on Finance
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Washington, DC 20510-6200

RE: Comments to be submitted for the record in pursuant to the Committee's September 17 hearing, "Reforming America's Outdated Energy Tax Code."

The Renewable Energy Markets Association (REMA) is a 501(c)(6) nonprofit association dedicated to maintaining and growing strong markets for domestic renewable energy. REMA represents organizations that sell, purchase, or promote renewable energy products, including Renewable Energy Certificates (RECs), retail green power programs, utility green pricing services, and on-site renewable energy solutions. REMA engages in education and advocacy efforts on behalf of renewable energy marketers, utilities, manufacturers, developers, and others in renewable energy markets.

As Senators Wyden and Hatch continue debating tax reform, and particularly as they prepare for the Lame Duck session, REMA commends them for undertaking a monumental, but necessary, task. In particular, REMA applauds Senator Wyden for his opening statement before the Finance Committee on September 17. In order to create a strong, globally competitive marketplace, it is imperative that the tax code provides clear guidance about how energy resources contribute to that marketplace.

The disparity in how the current tax code treats energy sources and the resulting marketplace uncertainty is harmful to a growing, and diversifying, domestic energy market. As we know, traditional energy sources benefit from permanent tax incentives, while clean energy sources rely on incentives that must be renewed every few years. Though Congress often passes temporary extensions of those incentives, short-term extensions do not provide renewable energy developers the necessary time and market certainty to plan and finance facilities and related manufacturing. Senator Wyden reinforced the idea that reformed tax policy could remove these barriers, stating that "predicable, level-playing-field tax polices could clear the way for America's clean energy sector to thrive at home and outmatch global competitors hungrily eyeing the multi-trillion dollar market for energy goods and services."

REMA also commends the sponsors of the bipartisan Expiring Provisions Improvement Reform and Efficiency Act (EXPIRE Act, S. 2260). REMA believes that the legislation is a good beginning point for comprehensive bipartisan tax reform.

It is to this end that REMA writes the committee. Under current law via the wind production tax credit (PTC), taxpayers can claim a 2.3 cent per kilowatt hour tax credit for wind and other renewable electricity produced for a ten-year period from a facility that has commenced construction by the of last year. They can also elect to take a 30 percent investment tax credit instead of the production tax credit. REMA notes that the EXPIRE Act extends these provisions through December 31, 2015. While REMA would encourage the committee, Congress, and the president to approve legislation that would make the PTC permanent, thus putting renewable technology on a more level playing field with traditional energy sources and providing greater incentive for market growth, REMA also acknowledges that an extension of any kind is preferable to the current expired state of the credit. Energy project planning, financing, and permitting take time, and so it is critical that the tax code provides clear market signals so that renewable energy developers can take the necessary steps to grow the market.

On behalf of REMA, I thank you for the opportunity to share our perspectives on policies that seek to increase the market for renewable energy applications and technologies.

Respectfully submitted,

Patrick Serfass
General Manager
Renewable Energy Markets Association
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September 16, 2014

The Honorable Ron Wyden
Chairman
Committee on Finance
United States Senate
219 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Orrin Hatch
Ranking Member
Committee on Finance
United States Senate
219 Dirksen Senate Office Building
Washington, DC 20510

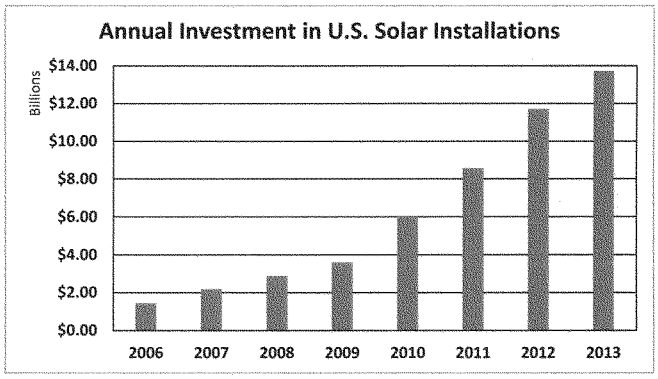
Re: SFC - "Reforming America's Outdated Energy Tax Code", September 17, 2014 10:15am

Chairman Wyden, Ranking Member Hatch and members of the Committee:

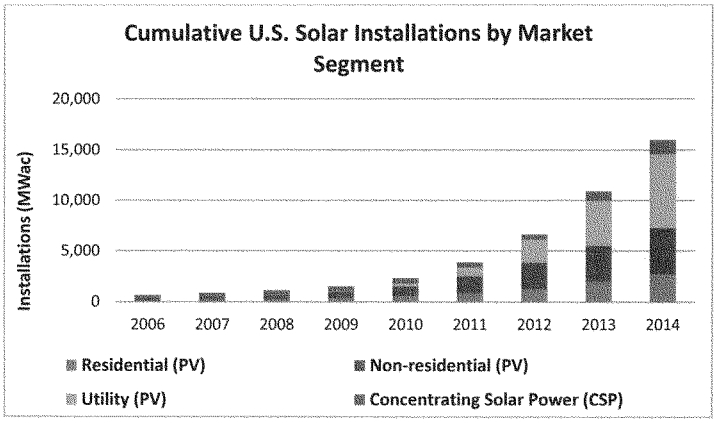
The Solar Energy Industries Association (SEIA) is the national trade association for the U.S. solar energy industry. On behalf of our 1,000 member companies and the more than 143,000 American taxpayers employed by the solar industry, I appreciate having the opportunity to submit a statement for the record on Reforming America's Energy Tax Code.

The U.S. should continue to strive for an "all of the above" energy strategy with a tax code that mirrors that commitment and provides parity and predictability to all energy resources, as the Chairman has espoused. Access to a diverse, abundant, reliable and affordable supply of energy has always been in the national interest, and history has shown that well-crafted and efficient federal tax incentives have provided a legislative and regulatory framework that has helped develop every major source of energy. The recognition that smart policy can play a vital role in spurring new domestic energy resources has contributed significantly to America's long-term economic prosperity and growth.

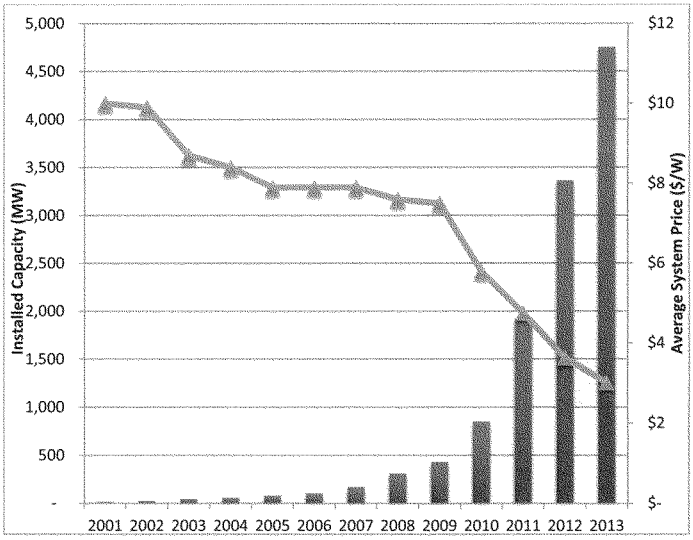
The nation's taxpayers have gotten an excellent return on their investment in helping to commercialize the solar energy industry to date and incentives for solar energy should be included in any reform of the energy tax code. Solar is an affordable, reliable and clean energy resource that has created thousands of jobs and driven the growth of small businesses throughout the country. Almost $14 billion was invested in the U.S. solar industry last year – roughly 700% more than in 2006, and there are now 143,000 Americans working at 6,100 companies throughout the U.S. While these companies range from manufacturers and developers to installers, many of them are small businesses that employ local electricians, contractors and plumbers.



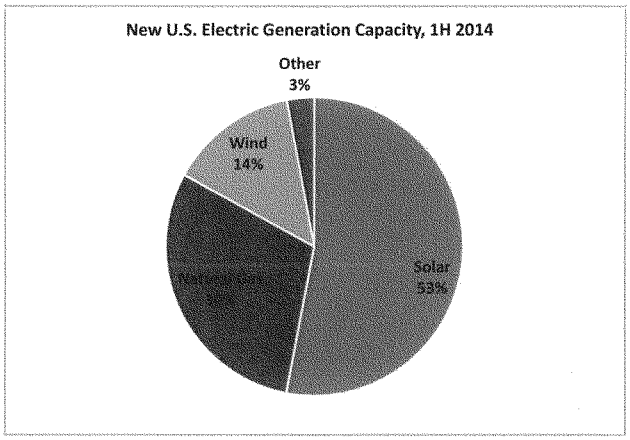
This growth has been driven largely by the Solar Investment Tax Credit ("ITC") and the Modified Accelerated Cost Recovery System ("MACRS"). Since the introduction of the 30-percent commercial and residential solar ITC in 2006, domestic deployment of solar has increased almost fifteen-fold, the cost to homeowners and businesses has dropped significantly, and the solar industry has grown from a niche market to a value chain that today employs over 143,000 Americans at 6,100 companies. Over 3.2 million homes are now powered by solar with 16,000 MW of solar capacity online as of Q2 2014.



In addition, solar prices have fallen dramatically as generation capacity has been deployed. From the ITC's inception in 2006 to Q2 2014, prices for installed residential solar have dropped 53%, 60% for commercial solar and 68% for utility-scale solar. Installed utility-scale solar is now well below $2/watt and solar is competing head-to-head with natural gas for contracts.



Finally, solar's growth has been so dramatic that 53% of all new generating capacity that came online in the first half of 2014 was solar. This highlights solar's versatility and its ability to be deployed at the residential, commercial and utility scale.



The brief duration of the solar Investment Tax Credit demonstrates that smart, predictable energy tax policy can yield significant benefits to the U.S. economy and taxpayers. As the Committee determines the future of energy tax policy, it should strive for parity across energy resources and regulations on which businesses and those they employ can rely for years to come.

Thank you for this opportunity to provide feedback on the upcoming hearing on Reforming America's Energy Tax Code.

Sincerely,

Rhone Resch
President & CEO
Solar Energy Industries Association

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September 17, 2014

Senate Committee on Finance
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RE: Hearing: Reforming America's Outdated Energy Tax Code

Ladies & Gentlemen of the United States Senate Committee on Finance:

I am writing you about the long outdated Energy Tax Code which is inhibiting growth and minimizing investment in both government owned and private buildings of our country. These buildings consume between 20 and 40% of the energy used in the United States.

As an entrepreneurial business owner it is embarrassing to say that there is a need for the government to stimulate investments in energy conservation. Regretfully I find that in working with my commercial building owners and operators they need additional incentives beyond the attractive financial paybacks offered by many energy investments.

Regulations that require ever more efficient building codes paired with incentives like EPAct 179D that reduce the pay back for costly investments in energy efficient building equipment have shown success in reducing commercial building energy efficiency. The eight years of section 179D incentives have demonstrated that incentives for energy efficient lighting and HVAC (Heating, Ventilating and Air Conditioning) can help American buildings substantially reduce energy use.

There are tremendous opportunities available to improve the efficiencies as well as the comfort levels in commercial buildings but we need a tax code that proves an extra measure of economic return to get these projects acted upon.

It is my hope that your committee will take action to move America toward becoming energy independent by creating tax based incentives for both the designers and owners of public and private commercial facilities.

Yours truly,

Douglas B. Cohn, CEO

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