TESTIMONY OF NEIL Z. AUERBACH, MANAGING PARTNER OF HUDSON CLEAN ENERGY PARTNERS, BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
UNITED STATES HOUSE
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on
"THE AMERICAN ENERGY INITIATIVE"
POLICY RECOMMENDATIONS IN H.R. 909, "A ROADMAP FOR AMERICA'S ENERGY FUTURE"

Mr. Chairman, Ranking Member, members of the committee, thank you for the opportunity to testify here today. It is truly an honor.

My name is Neil Auerbach, and I am the Founder and Managing Partner of Hudson Clean Energy Partners. Hudson Clean Energy Partners is a global private equity firm that focuses exclusively on investing in the clean energy sector. With over $1 billion in assets under management, Hudson is a leading global investor in sectors that include wind, solar and hydroelectric energy, biofuels, biomass, smart grid, electric vehicles, energy efficiency and storage. Given our position on the front lines of these fast-growth industries, we have seen firsthand the impact of government policies on private sector capital flows in our sector, both at home and abroad.

Based on this experience, I would like to offer my support for the Reverse Auction Mechanism for Renewable Energy Generation in Title III of H.R. 909. The innovative approach to supporting the continued growth of the renewable energy sector contained in H.R. 909 is entirely consistent with the stated goals of the American Energy Initiative to reduce overall energy costs, increase domestic sources of energy, and support long-term job and wealth creation in the United States. Before I offer detailed comments on the reverse auction proposal, I want to explain clearly and in the simplest terms why support for clean energy[1] is critical to our energy security, and is beneficial to our economy and our environment.

[1] The term "clean energy" has many definitions, as many industries want the moniker of being called "clean." Here, I used the term to refer to renewable energy (wind, solar, biomass, geothermal, hydropower, biofuels) and energy smart technologies (including smart grid, building efficiency, industrial efficiency, transport efficiency and storage).

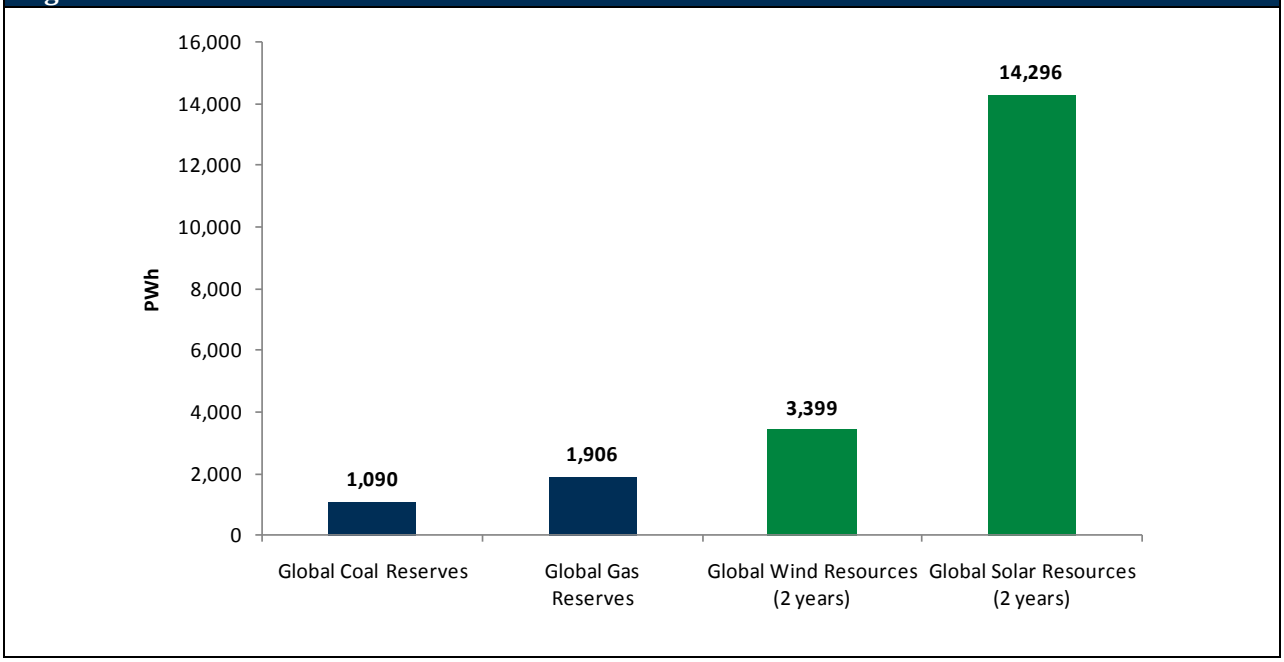
Domestic clean energy development is vital to our national interest

Energy Security

Energy security is enhanced when we produce more of the energy we consume here in the United States. The United States currently imports roughly 23% of its primary energy from abroad[2], including 51% of the oil that we consume[3]. In dollar terms, we shipped almost $275 billion abroad in 2010 and will ship close to $370bn abroad in 2011 in order to fuel our economy at home[4]. In order to mitigate the risks associated with our dependence[5] on foreign sources of energy, the United States should increase domestic production of all sources of energy. Although Congress should not pick energy winners and losers, the goal of improving our energy security is enhanced further by improving access to unlimited sources of domestic energy than by improving access to energy resources of finite duration. Increasing our production of domestic fossil fuels may improve our energy security, but a careful analysis of resource availability shows that increases in our domestic stores of accessible fossil fuels are measured at most in decades, whereas increases in our stores of renewable energy capacity have infinite duration.[6] Figure 1 highlights the stark contrast between global coal and gas reserves and just two years worth of wind and solar supply. Our energy policy should focus on utilizing more of these clean energy resources.

[2] EIA estimates for 2009 total US energy production (72,970 quads) and consumption (94,578 quads)
Consumption: http://www.eia.gov/totalenergy/data/annual/txt/ptb0201a.html
Production: http://www.eia.gov/totalenergy/data/annual/txt/ptb0102.html
[3] EIA – "How dependent are we on foreign oil?" http://www.eia.gov/energy_in_brief/foreign_oil_dependence.cfm
[4] Assumes an average $/bbl of WTI Crude of $79.40 in 2010 and $102.67 in 2011 and net imports of 9.4 and 9.8mmbd respectively: http://www.eia.gov/emeu/steo/pub/contents.html
[5] Location of equipment manufacturing is not more relevant to energy security than location of manufacturing of an oil rig or gas turbine.
[6] Proven reserves of coal in the US (260bn tons) equal roughly 200 years worth of US supply at current consumption rates (1.1bn tons/yr). Proven reserves of conventional and unconventional oil (200bn bbl) and gas (400 - 2,000tcf), however, represent only 30 and 15-80 years, respectively, of remaining oil and gas supply at current consumption rates (oil: 7bn bbl/yr; gas: 26tcf/yr). By contrast, wind and solar development sites can be upgraded every 25-30 years to continue providing renewable energy into perpetuity since there are no resource constraints. (US theoretical wind potential: 8,000GW onshore ad 2,200GW off-shore; US theoretical solar PV potential: 206,000GW)
– EIA, MIT, NREL, Hudson Estimates

Figure 1: Power Potential of Global Natural Resources



Sources: BP, Chatham House, U.S. Department of Energy, Physics Factbook, Hudson estimates

Economic Rationale

Increasing our domestic production of clean energy, along with siting a significant part of the associated manufacturing chain in the United States, promotes US competitiveness, increases domestic jobs and creates wealth that grows our GDP and reduces our trade deficit.

Our international trading partners -- led by China -- are laying plans for massive investments in the clean economy. The clean energy market is forecast to triple in size during this decade, from $740 billion in 2009 to over $2 trillion by 2020,[7] exceeding global GDP growth even under the most conservative growth scenario and annual capital invested in additions to clean energy generation capacity is already pulling even with fossil fuel generation capacity.[8] The vibrant markets for clean energy and energy smart technologies, such as smart grid, ultra high capacity transmission, advanced energy storage, LED lighting, and electric vehicles, will be dominated by countries encouraging investments in R&D, manufacturing and deployment. In 2010, the U.S. accounted for 14% of the clean energy market, but its pole position fell for the second year in a row. Germany and China accounted for 17% and 22% respectively in 2010, taking the number one and two positions, which belonged to the US in the two years prior.[9] Further, the

[7] HSBC Global Research, "Sizing the climate economy", September 2010
[8] Bloomberg New Energy Finance: annual capital invested in additions to clean energy ($187bn) and fossil fuel generation capacity ($219bn)
[9] Bloomberg New Energy Finance and Pew Charitable Trust "Who's Winning The Clean Energy Race? 2010"

United States lags our trading partners in terms of clean energy manufacturing capacity. For example, only 6% of worldwide PV cell production takes place in the United States while 59% of global cell production takes place in China.[10] And, in terms of clean energy deployment, the US leadership has begun to wane. For example, in 2007, the United States installed nearly 6GW of renewable energy capacity, approximately 60% of all domestic newly installed power generation capacity[11]. China, by contrast, installed less than 5GW[12] of renewable energy capacity, approximately 6%[13] of its newly installed power generation that year. Just 3 years later the picture changed dramatically. In the United States, only 5GW of renewable energy capacity was installed in the United States, whereas nearly 17GW of renewable energy capacity was installed in China.[14] Over the same period, China moved up the league tables of top ten manufacturers of wind turbines and solar panels (See Figures 2 & 3).

Figure 2: Top 10 Global Wind Manufacturers 2005, 2010 (Rank Order by Production - GW)

2005			
	Company	Country	Production
1.	Vestas	Denmark	3.2
2.	Enercon	Germany	2.7
3.	Gamesa	Spain	1.9
4.	GE Wind	US	1.3
5.	Seimens	Denmark	1.1
6.	Suzlon	India	0.9
7.	Repower	Germany	0.9
8.	Goldwind	China	0.7
9.	Nordex	Germany	0.5
10.	Ecotecnica	Spain	0.3

2010			
	Company	Country	Production
1.	Vestas	Denmark	6.3
2.	GE Wind	US	6.0
3.	Sinovel	China	5.3
4.	Gamesa	Spain	4.4
5.	Goldwind	China	3.6
6.	Suzlon	India	3.5
7.	Enercon	Germany	3.4
8.	Dongfang	China	3.0
9.	Repower	Germany	2.9
10.	Siemens	Denmark	2.9

	Europe	US	China	Other Asia
2005 Totals	10.6	1.3	0.7	0.9
2010 Totals	19.9	6.0	11.9	3.5

Sources: Bloomberg New Energy Finance (It is reported that Sinovel has overtaken GE as the second ranked manufacturer)

[10] Solarbuzz (data includes Taiwan)
http://www.solarbuzz.com/our-research/recent-findings/solarbuzz-reports-world-solar-photovoltaic-market-grew-182-gigawatts-20
[11] U.S. EIA – Electric Net Summer Capacity
http://www.eia.gov/cneaf/alternate/page/renew_energy_consump/table4.html
[12] Bloomberg New Energy Finance Database
[13] Reuters: China installed capacity hits 710 GW in 2007
http://uk.reuters.com/article/2008/01/09/china-power-capacity-idUKPEK24321320080109
[14] Bloomberg New Energy Finance and Pew Charitable Trust "Who's Winning The Clean Energy Race? 2010"
Total installed renewable capcity: US (58GW) China (103GW) - http://bnef.com/WhitePapers/download/36

Figure 3: Top 10 Global PV Cell Manufacturers 2006, 2010 (Rank Order by Capacity - MW)

2005			
	Company	Country	Production
1.	Sharp	Japan	500
2.	Q-Cells	Germany	420
3.	Suntech	China	270
4.	Motech	Taiwan	240
5.	Solarworld	Germany	200
6.	China Sunergy	China	180
7.	Kyocera	Japan	180
8.	Isofoton	Spain	130
9.	Schott	Germany	121
10.	Sanyo Electric	Japan	115

2010			
	Company	Country	Production
1.	JA Solar	China	1,900
2.	Suntech	China	1,620
3.	First Solar (TF)	US	1,502
4.	Yingli	China	1,100
5.	Trina Solar	China	1,000
6.	Q-Cells	Germany	1,000
7.	Canadian Solar	China	800
8.	Motech	Taiwan	600
9.	Gintech	Taiwan	600
10.	JinkoSolar	China	600

	Europe	US	China (incl. Taiwan)	Other Asia
2005 Totals	871	0	690	1035
2010 Totals	1000	1502	8220	0

Sources: Bloomberg New Energy Finance

To be competitive, the US must not just maintain its edge in R&D investment, but focus even more on encouraging the growth of manufacturing and deployment at home, as are other countries around the world. America is not predestined to remain home to the most vibrant economy in the world forever. We need to rise to the challenge.

While striving to improve our global competitiveness, we must also address our most immediate concerns at home: creating jobs and reducing the cost of energy. Investments in clean energy today can support a 21st century industry in the United States and foster productive job creation as the country diversifies its energy mix. Interestingly, despite the recession, we are expected to see 143,000 jobs created in the wind industry and 58,000 jobs created in the solar industry.[15] Two of our trading partners, China and Germany, boast even more jobs in their home markets. China estimates that it employs approximately 1.4 million people in the clean energy sector.[16] Germany, on the other hand, estimates that it employs approximately 370,000 people in their clean energy sector.[17] A focused effort on making the United States a more welcome home for clean energy manufacturing and deployment can result in even more job creation here at home.

[15] Lawrence Berkeley National Laboratory (LBNL) and The National Renewable Energy Laboratory (NREL)
[16] NY Times: "China Leading Global Race to Make Clean Energy"
http://www.nytimes.com/2010/01/31/business/energy-environment/31renew.html
[17] Gross employment from renewable energy in Germany in 2010
http://www.bmu.de/files/english/pdf/application/pdf/ee_beschaeftigung_2010_en_bf.pdf

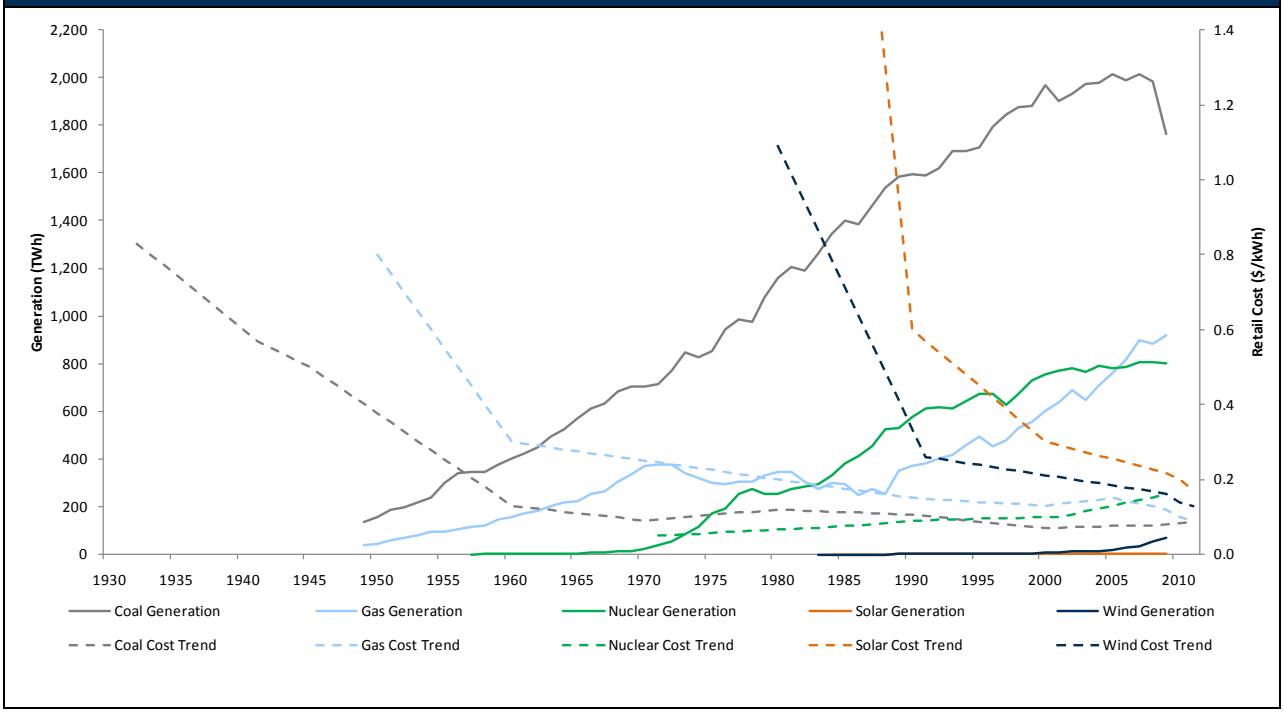
Many people mistakenly believe that wind and solar, as well as other forms of clean energy, are interesting technologies that may become scalable and affordable in the future if we make sufficient progress on the technology front. This is a serious error. More solar energy capacity was installed in 2010 around the world than nuclear power.[18] The cost of solar energy today is cheaper than the cost of nuclear energy from a Gen III nuclear power plant.[19] The pace of annual solar installations around the world will have increased nearly fifteen fold between 2005 and 2011, and installations are forecast to double again by 2015.[20]

Costs of wind and solar energy have come down almost as quickly as the scale of the industries has increased. The history of the power industry reveals that all new energy sources start out expensive, and get cheaper with scale. Wind and solar are following suit today, and at a pace even more dramatic than coal, natural gas or nuclear did in their day. The cost of wind power, for example, has fallen by 30% over the past 3 years.[21] Recent anecdotes suggest that in some markets, wind power is now cheaper than power generated from a combined cycle gas plant (CCGT). The progress of the solar industry in reducing costs is even more impressive. The cost of solar power has dropped approximately 15% per year over the past several years, and is expected to continue. On the current pace of cost reduction, solar energy may be cheaper at distributed generation scale in many markets than power generated by fossil fuels within 5 years. [22]

The following chart, which was produced by my colleagues for an article published in the Journal of Environmental Finance[23], catalogues the history of price movements of electricity powered by coal, natural gas, and nuclear energy since 1930. History teaches us that each of these power sources has required achieving massive scale in order to achieve their current favorable cost structures. Hudson's research confirmed that small increases in scale are causing significant improvements in the cost structures of the wind and solar industries. Figure 4 clearly demonstrates that wind and solar energy have reduced costs more rapidly than any other type of conventional energy source over the last 80 years.

[18] The World Nuclear Industry Status Report 2010-2011, Draft Version – 2010: 5GW of nuclear reactor startups http://www.worldwatch.org/system/files/NuclearStatusReport2011_prel.pdf
[19] "Solar and Nuclear Costs – The Historic Crossover" – Solar (14-18 cents/kWh) vs. Nuclear (~20 cents/kWh) http://www.ncwarn.org/wp-content/uploads/2010/07/NCW-SolarReport_final1.pdf
[20] Photon Consulting Database:
2005–2011 annual installations (1.8GW to 27GW); 2015 (51GW annual installation, 225GW total installed)
[21] Hudson estimates
[22] See comments of Mark Little, research director of General Electric, reported in http://www.bloomberg.com/news/2011-05-26/solar-may-be-cheaper-than-fossil-power-in-five-years-ge-says.html
[23] Environmental Finance, "Making the Case for Clean Energy", December 2010 - January 2011

Figure 4: U.S. Electricity Generation and Retail Cost by Energy Source (1930 – 2011)



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

The rapid reduction in clean energy's cost structure is projected to continue, and will bring these technologies into grid or retail parity with conventional power sources over time, even cheaper than conventional power sources in more and more markets over time.

Two solar companies in our portfolio illustrate the dramatic progress being made in reducing the cost of solar energy.

Calisolar is a California-based manufacturer of silicon, wafers and cells that are sold to manufacturers for use in making solar panels. Calisolar is unique in its ability to manufacture silicon feedstock that is much cheaper than conventional silicon without compromising quality. With manufacturing scale only a fraction of its more established competitors, Calisolar is manufacturing its silicon far cheaper than most of its industry peers. And in an all-too-rare industry role reversal, our American company is exporting its product to China. We expect Calisolar to be able to manufacture at below $20/kilogram as compared to the current industry average of $34/kg on volume-weighted basis/kilo[24], and therefore we believe that Calisolar will become the lowest cost manufacturer of silicon in the world when it builds it manufacturing facility in the United States.

[24] Photon Consulting Database, Hudson Estimates

Another innovative company dramatically reducing the cost of solar energy is SoloPower, a California based manufacturer of unique lightweight, flexible, high-power solar panels that possess critical advantages for both rooftop and ground mount solar market applications. By flexible, I mean thin, bendable, and utterly unlike the traditional flat-plate solar panels familiar to most people attending today's hearing. This unique form factor expands the total addressable market for solar energy given that approximately three quarters of commercial and industrial rooftops in sunny environments are not designed to bear the load of rigid glass solar panels, which weigh about five times as much as SoloPower's panels. SoloPower's product can be integrated into a roofing membrane and unrolled on a rooftop much like carpeting. Alternatively, it can be adhered directly to a rooftop without the need for physical penetrations or racking systems. This speeds installation time and reduces balance-of-system ("BOS") cost, delivering an industry-leading levelized cost of energy that is competitive with retail electricity prices in many regions of the world. We expect that SoloPower rooftop solar systems will bring the cost of delivered to approximately 10 cents/kwh, below the cost of retail peak power in many power markets in the United States. As a result, demand for SoloPower's product far exceeds its current manufacturing capacity, and the company has decided to build a large-scale manufacturing plant in the state of Oregon.

Environmental

Finally, clean energy is more beneficial to our environment than energy derived from fossil fuels. There are a wide variety of environmental hazards associated with utilizing fossil fuels for energy generation. The largest contributors to air and water pollution are automobiles and industry because of their reliance on fossil fuels. Burning oil, gas, and coal produces waste streams that include sulfur dioxide, nitrogen dioxide, carbon monoxide, airborne particulates, and volatile organic compounds that cause acid rain and urban smog. Acid rain is among the worst contributors to estuary, bay and water table contamination, while urban smog and particulates cause serious respiratory problems in humans and have adverse effects on wildlife and agriculture. The fossil fuel that is most deleterious to the environment is coal. Of particular relevance here is the impact of coal combustion on mercury levels in the atmosphere and water, as well as sulfur and nitrogen compounds. It is projected that mercury and acid gas regulations for coal fired, utility scale power plants will lead to a significant reduction of these plants in the near term. Furthermore, the vast majority of the scientific community views the buildup of greenhouse gases in our atmosphere from fossil fuels as a serious environmental hazard. By contrast, the environmental impact of clean energy on air, water, and land is the most benign of any natural energy source.

Policy makers must balance the environmental risks associated with increased production of fossil fuels with the economic and energy security benefits they offer. The idea that we must choose between cheap

energy and our environment is false. We can have both. By providing a market-driven mechanism for facilitating the next phase of growth for clean energy deployment in the United States, the Reverse Auction Mechanism proposed in H.R. 909 cheapens the cost of a cleaner environment with increased clean energy deployment.

Reverse Auction: A more efficient way to grow our domestic clean energy industry

I would now like to focus my testimony on the Reverse Auction Mechanism for Renewable Energy Generation in Title III of H.R. 909, specifically how it can be designed to be more efficient than existing incentives for clean energy.

The incentives currently on the books for clean energy, which reside primarily in the tax code, are not efficient. Although the industry has found ways to utilize and thrive on these incentives, neither the industry nor the government is getting the best bang for its buck. Most renewable energy generators cannot utilize the tax credits that are created by Sections 45 and 48 of the Internal Revenue Code because even the most successful renewable projects generate net operating losses in their first years as a result of accelerated depreciation and interest expense deductions. The tax credits, which often are the determining factor in whether a project makes economic sense, must then be sold into a small market of institutional investors with tax appetite. The friction cost associated with selling these tax credits been estimated at between 35-40 cents for every tax credit dollar.[25]

During the financial crisis, the market for tax equity dried up and investment in the clean energy industry came to a stand-still. To address this problem, Congress passed legislation in 2009 to empower the Treasury Department to exchange tax credits held by renewable energy project owners for cash. In so doing, Congress eliminated much of this friction cost and made the existing Federal clean energy incentive mechanism more efficient.

I believe that a reverse auction, properly structured, can be a more efficient policy to grow our domestic clean energy industry than the current system of tax incentives. Reverse auctions are conducted by buyers to encourage sellers to sell at the lowest price. The history of reverse auctions suggests that they work to lower cost.[26] In addition to the benefits of placing a market-driven auction mechanism at the heart of Federal clean energy policy, H.R. 909's Reverse Auction Mechanism offers other tangible improvements over the current system. First, without the need to resort to a limited market of tax equity

[25] Bipartisan Policy Center, "Reassessing Renewable Energy Subsidies" (March, 2011) http://www.bipartisanpolicy.org/library/staff-paper/reassessing-renewable-energy-subsidies-issue-brief
[26] Bloomberg New Energy Finance, "Wind tender analysis in Brazil: Winner's Curse?"

lenders, the U.S. market for clean energy project finance would become much more liquid, resulting in lower funding costs. In addition, without the specter of perennial expiry of Federal tax incentives, the comfort of a solvent trust fund as envisioned by H.R. 909 would give all market participants, including manufacturers of value chain products, more confidence in the longevity of the U.S. market, increasing capital commitments to the sector with long term payoff profiles. The market values of most companies with significant clean energy investments in the U.S. would likely improve.

The U.S. Federal Government is not alone in its interest in the use of reverse auctions to support clean energy deployment. Brazil, for example, recently completed two reverse auctions for capacity to be built in one and three years. Contracted power under Brazil's previous feed-in tariff incentive policy, PROINFA, averaged $136/MWh. One year later, under the new reverse auction mechanism, wind power prices came down precipitously to an average of $74.4/MWh, over 40% lower than under the previous feed-in tariff regime. Many other Latin American countries are following suit in an effort to reduce overall system costs.[27] Argentina, Mexico, Peru, Honduras, Uruguay, in addition to China, Morocco, and Egypt, all developing markets with an interest to displace more expensive fossil generation, have recently conducted reverse auctions for wind power. These countries are finding that reverse auctions are particularly attractive because they offer price discovery through competitive bidding that often leads to dramatic price reductions.

The California Public Utilities Commission also recently approved a reverse auction mechanism that will apply to the state's three largest investor-owned utilities. Although we will need to wait for the results of California's experience, the California Public Utilities Commission (CPUC) has indicated that it expects the mechanism to "allow the state to pay developers a price that is sufficient to bring projects online but that does not provide surplus profits at ratepayers' expense, providing a clear and steady long-term investment signal rather than providing a pre-determined price [via] a competitive market."[28] Developers and industry groups alike have expressed enthusiasm for the upcoming auctions because the program is anticipated to spur the development of many 1 – 20MW projects across the State.

Positive attributes of the Reverse Auction Mechanism Proposal in H.R. 909

The Reverse Auction Mechanism as designed in Title III of H.R. 909 includes many positive attributes. It would provide for consistent and efficient support for renewable generation. By establishing a dedicated source of funding through the creation of the American-Made Energy Trust Fund ("Trust Fund"), the bill would provide the kind of long-term certainty absent from the current tax credit approach. Through the

[27] Bloomberg New Energy Finance, "Wind tender analysis in Brazil: Winner's Curse?"
[28] New York Times, "A 'Reverse Auction Market' Proposed to Spur California Renewables" http://green.blogs.nytimes.com/2009/08/28/a-reverse-auction-market-proposed-to-spur-california-renewables/

Trust Fund mechanism, renewable developers would be able to rely on a steady source of support without the need for Congressional appropriations, or any other action by Congress. Moreover, the cash flowing to a particular project from the Trust Fund would reflect a market-driven assessment of the actual amount of cash flow required by the project developer to complete the project, rather than an amount prescribed by Congress, as is currently reflected in the tax code. This amount invariably would be lower than the amount currently funded by taxpayers. Rather than relying upon complicated ways to transfer tax benefits to financial institutions, accessing cash flow from the trust fund would be far simpler, encouraging the development of a more liquid project finance market, resulting in even lower costs for clean energy to rate payers.

H.R. 909's reverse auction mechanism incorporates a host of features that seek to avoid the design mistakes of other reverse auctions, including the recent Brazilian auction experience. For example, H.R. 909 calls for security requirements at the time of the bid submission, to ensure that bidders have the requisite financial resources to deliver on their contractual promises. Additionally, to ensure that the reverse auction mechanism furthers the goal of diversifying our energy sources, the Bill calls for separate reverse auctions conducted in different regions of the country, and also requires that no more than 60% of the awards can come from one type of renewable technology and no more than 90% come from two technologies.

To provide for flexibility, the language provides that a winning bidder be able to generate in excess of their specified annual amount and earn credits to be used for insufficient generation in the subsequent two years. If a winning bidder fails to generate the quantity of electric energy guaranteed in four successive years, the Authority may terminate the contract. The awards from the Trust Fund would be capped each year at the amount of energy to be generated under the contract.

Finally, to prevent double dipping, the language provides that a winning bidder would not be eligible for tax credits under Sections 45 or 48, and would not be eligible for a loan under the Loan Guarantee Program. A developer would need to make a choice. Moreover, the award would not be included in gross income to ensure that the developer's tax bill does not increase.

Suggested improvements to the Reverse Auction Mechanism Proposal in H.R. 909

Although the Reverse Auction Mechanism in H.R. 909 is thoughtfully designed, there is room for improvement. At present, some design flaws might prevent the system from working at all. Other improvements can be made to make the system work even more efficiently. Allow me to offer more concrete examples.

As currently drafted, H.R. 909 requires the renewable generator to identify a purchaser for the electric energy before participating in the reverse auction. This could be particularly problematic, since developers generally enter into PPAs only once they know whether they can earn their target return on equity. Thus, requiring that a bidder secure a PPA before it can submit a bid would likely prevent that bidder's participation in the reverse auction since, without securing a trust fund allocation, the renewable generator would not meet its required return. One way to solve this problem would be to empower a Reverse Auction Authority (RAA) to be directed to purchase energy from generators under long-term PPAs, as well as to allocate money from the trust fund. The RAA could hedge its risk from entering into long term PPAs by selling electricity into wholesale and bilateral power markets. Guidelines could be established around the RAA's purchase and sale of electricity to limit risk taking. The Trust Fund could then be used to cover any losses from power trading, with gains returned to the Trust Fund.

In addition to empowering the RAA to purchase and sell power, another improvement to the Reverse Auction Mechanism in H.R. 909 would be to empower RAAs to purchase and sell renewable energy credits ("RECs"), which often represent a vital income stream to renewable energy developers. Therefore, I propose that the Reverse Auction Authority be required to offer to purchase RECs from renewable energy developers and resell them in the market, returning any gains to the Trust Fund. Renewable developers could bid in RECs as part of its project price, and the RECs then could be resold to entities that have REC obligations. Inclusion of RECs in the reverse auction would have the effect of lowering REC prices, thereby benefiting ratepayers in states with renewable portfolio standards. In effect, inclusion of REC trading within the mandate of the RAA would immediately bring many of the benefits of a national renewable energy standard without imposing a Federal mandate.

Therefore, the limitation contained in H.R. 909 of the use of the reverse auction to the distribution of monies from the Trust Fund should be eliminated. A more complete use of the reverse auction, along with expanded powers by the RAA, would further the goal of reducing the cost of clean energy.

In thinking about how this reverse auction would work, it seems to me that the amount of energy and RECs to be purchased could be determined by the RAA based on (i) the amount of funds available in the Trust Fund and (ii) the amount of interest expressed by entities for the purchase of Federal RECs. To ensure that there is sufficient interest in the reverse auction – particularly in the early years – I would recommend that Federal agencies be directed to purchase all their REC needs through the reverse auctions. Moreover, I would recommend that each State regulatory authority in states that have a renewable portfolio standard be directed to conduct a proceeding to consider permitting utilities in their state to purchase "Federal RECs" to satisfy, in whole or in part, their utilities' state REC obligations under their RPS. While States are engaging in such proceedings, the RAA would be permitted to sell

"regional RECs" in addition to Federal RECs. Regional RECs are RECs from a generator located either inside the state in which the purchaser is located or outside the state, but within the same region, as the state in which the REC purchaser is located. Most states with RPS requirements currently permit their utilities to satisfy their RPS obligations with regional RECs. This approach would allow for the establishment of a truly national REC market, lowering the compliance burden on utilities and the cost to ratepayers, without the need for a Federal mandate.

H.R. 909 proposes that the Secretary of Energy conduct the reverse auction through an office within DOE. Since I am proposing that the RAA's functions be expanded to include the purchase of power and RECs, I am concerned that the approach would impose on DOE a responsibility it current does not have – the purchasing and selling of power and associated RECs. Instead, I propose that the functions be delegated to a private entity with the expertise to conduct such auctions. DOE would be given oversight responsibilities.

Finally, H.R. 909 provides that monies from the Trust Fund would be subject to appropriations Acts. The intent of the reverse auction process is to provide for consistent, economical and long-term support for the renewable industry. One of the key challenges in relying on federal tax credits for support has been the cycles of expirations and extensions. During each period leading up to an expiration, investments in renewable generation have fallen dramatically. I am concerned that subjecting the amounts in the Trust Fund to annual appropriations would have the same chilling effect on renewable development. I therefore propose that language be added to assure that the Trust Fund provides renewable developers with a steady source of support without the need for Congressional appropriations, or any other action by Congress.

Conclusion

The U.S. has been the global leader in inventing the clean energy products that the world is currently using, and that leadership position, while threatened, has not yet been lost. However, without a national commitment to becoming a global manufacturing leader, and increasing domestic consumption of clean energy, the United States will lose its technology edge quickly. Our trading partners will seize on the wavering of our resolve, and will grab the mantle of clean technology leadership to the benefit of their citizens and public wealth. We have already seen these trends emerging. I have not appeared before this Committee looking for expensive handouts. The fossil fuel industry has benefited from far more Federal

largesse[29] than the clean energy industry ever will, and ever will need. Competition among various energy resources is healthy and should be encouraged. However, it is only with a broad, historical perspective and insight into the competitive dynamic of today's global energy marketplace, that Congress can make wise policy choices. I hope that my testimony will help this Committee to perform its vital task.

I thank the Committee again for the opportunity and honor to present my views on this important topic of national interest.

[29] Cumulative federal energy (electricity and transportation) incentives for oil, natural gas, coal and nuclear totaled $594bn (2006 dollars), 82% of energy incentives, while federal incentives for solar, wind and geothermal totaled just $52bn (2006 dollars), 7% of energy incentives. The remaining $80bn, 11%, went to hydro.
- Analysis of Federal Expenditures for Energy Development. Management Information Services. February 2008 http://www.misi-net.com/publications/2008energyincentives.pdf