Testimony of

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Introduction

Good morning Chairwoman Boxer, Ranking Member Inhofe and members of the Committee. My name is Wayne Krouse and I am the founder, chairman and CEO of Hydro Green Energy, LLC. I greatly appreciate the opportunity to briefly share Hydro Green Energy's story with the Committee, and to discuss how clean technology companies like Hydro Green Energy can contribute to addressing the pressing environmental and energy issues this country faces, while at the same time creating a large number of jobs for America's skilled and experienced workforce, leading to economic development opportunities now and in the future.

I am also here to state very clearly that policies, such as climate change legislation that recognize and financially value the many benefits of our nation's clean energy technologies, particularly their carbon-free profile, will act as a huge driver for growth and development of the clean technology industry. Recent policies that I will later highlight have helped ensure our traction in the marketplace, as well as some interest from the investment community, but additional policies are needed now, especially as the U.S. continues to struggle to emerge from the economic crisis and venture capital and debt finance largely remains on the sidelines. Properly structured policy can drive growth and market activities. New policy, as well as policy refinement, is needed if we are to see the explosive growth of the clean tech sector that we all desire.

About Hydro Green Energy

Hydro Green Energy is a Texas-based renewable energy systems developer and integrator operating in the waterpower industry. Hydro Green Energy holds U.S. Patent #6,955,049, two international patents, and has over 100 pending patents. Hydro Green Energy's hydrokinetic power systems generate electricity exclusively from moving water, such as river, tidal and ocean currents, without having to first construct dams, impoundments or conduits. The company's hydrokinetic technology platform is also deployable downstream from existing hydropower projects, which is a system we call Hydro+™. These projects bolster the clean power output of an existing hydropower facility in an environmentally-sound manner using a cutting-edge waterpower technology. They are essentially turbochargers for existing hydropower facilities, creating more clean power from the same water.

Hydro Green Energy, a start-up company, closed its Series-A funding in April 2008 with a $2.6 million investment from the Quercus Trust, a prominent and leading investor in alternative energy companies with intellectual property. We hope to soon close our Series-B funding, placing the company in a position to grow rapidly, advance all power projects in our pipeline and continue our innovative technology development. We are presently developing 15 waterpower projects in Alaska, Iowa, Illinois, Louisiana, Minnesota, Mississippi, New York and Wisconsin. We also plan to develop projects in Ohio and Pennsylvania. These projects will cumulatively amount to over 500 MW of base load, zero carbon energy.

The founder of the Quercus Trust, Minnesota native and California resident David Gelbaum, is a conservationist and environmentalist who has over the years committed hundreds of millions of dollars to environmental causes and land conservation efforts. We are honored and proud to have him as our lead investor. I am a chemical engineer by degree and left an Exxon Chemicals joint venture in 2001 to start Hydro Green Energy. Prior to my job with Nalco/Exxon Energy Chemicals, I worked as a Senior Field Engineer in the Gulf of Mexico oil fields for Schlumberger. While I might not be as well known as a certain Texas oil man now committed to renewables, I am also using my conventional energy resources background to ensure that promising new clean energy technologies are delivered to America and I am deeply committed to this cause, as are my Hydro Green Energy colleagues and partners.

I am also pleased to let the Committee know that Hydro Green Energy is the first company in America with an operational and federally-licensed hydrokinetic power project. Located in Hastings, Minnesota, our hydrokinetic power project, which was developed in partnership with the City of Hastings, was approved last December by the Federal Energy Regulatory Commission by a 5-0 vote. The project led to the creation of 61 jobs in seven states over a two-plus year period, and I will discuss our job impacts in greater detail later in my testimony.

The Hastings project, a public-private partnership with the City at U.S. Army Corps of Engineers Lock and Dam No. 2, was installed over the winter and began generating clean, renewable electricity this spring. It is the only hydrokinetic power project exporting electrons to the U.S. power grid in U.S. history. Two weeks ago, I was honored to provide a tour of the facility to Brigadier General Michael J. Walsh, Commander of the United States Army Corps of Engineers Mississippi Valley Division, and Colonel Jon L. Christensen, USACE St. Paul District Commander. Both of these decorated, experienced officers and their staff played a key role in the successful deployment of this groundbreaking renewable energy project.

At the Hasting project, we proved that new clean energy projects can be developed at Corps' sites without interfering with the Corps' important navigation and flood control mission. We look forward to working with the Corps on many other projects in the same manner so we both can work to see that the Commander-in-Chief's clean energy goals for America are met. The Hastings project was a major milestone for our company, and for U.S. clean energy policy. We hope that the Hastings project will act as a catalyst for growth in the promising new waterpower technology sector, which has the potential to deliver tens of thousands of megawatts of clean, carbon-free, domestic, renewable power to America's electricity consumers, including those in the Midwest and Southeast.

Hydro Green Energy has also developed a patented technology that allows for power generation at existing non-powered lock and dam infrastructure. Known as Lock+™, this new technology is a power-generating lock gate that is deployed in the downstream portion of an auxiliary or active navigational lock, thus converting the facility into a renewable, baseload waterpower generation facility at prices up to 40 percent below conventional hydropower facilities.

Lock+ projects, which are installed within existing infrastructure without being structurally attached to the existing dam or lock walls, are removable and designed to work seamlessly with existing United States Army Corps of Engineers' navigational operations and can aid in the improvement of aging U.S. infrastructure, reducing costs to the taxpayer. This technology can also be modified and deployed in the cooling water discharge systems at thermal power plants (coal, nuclear) for energy recovery or energy efficiency purposes and is called Efficiency+™.

Hydro Green Energy is a proud member of the National Hydropower Association, the trade association representing the interests of the nation's waterpower industry. At a ceremony in Washington, DC last week, we were delighted to receive the 2009 NHA *President's Award*. This prestigious award is given to an NHA member company that has "blazed new pathways to strengthen and invigorate the waterpower industry." It was only the third time a member company has received this award.

Not only is Hydro Green Energy interested in addressing energy and environmental issues while creating new job opportunities, but we are also committed to investing in our future by providing educational opportunities for America's undergraduate and graduate students. We are beginning to accomplish that goal through the creation of a co-op program with Texas A&M University. Through this program, we

hope to ensure that our nation's engineering, business and environmental students enter the renewable power industry and contribute to its long term, sustained growth.

The motivating concept behind Hydro Green Energy is to reduce the costs of baseload, non-emitting renewable energy production from water resources so that it is less expensive than power generated through the use of fossil fuels and to maximize the use of existing U.S. infrastructure. The robust development of new waterpower technologies, such as those of Hydro Green Energy, will substantially bolster efforts to reduce the impacts of climate change, help improve air quality, boost reliability of the electric power grid, better help meet growing electricity demand and lessen dependence on fossil sources for the production of electricity.

U.S. New Waterpower Potential

There is a common belief, especially on Capitol Hill and within the environmental community, that the United States' waterpower industry is tapped out. That could not be further from the truth. And, if we are truly committed to reaching the clean energy goals of the Obama Administration and Congress, waterpower technologies and waterpower projects must play a strong role and be given an opportunity to develop in a timely and efficient fashion. Canada, the United Kingdom and other European countries realized these fact years ago and have made tremendous strides in advancing a variety of new waterpower technologies through aggressive R&D, financial and regulatory commitments. We have lost ground and precious time thorough our indecisiveness. The U.S. has some work to do if it wants catch up, and even pass, our friend in Europe and Canada.

Hydrokinetic power holds great promise as a new, carbon-free, domestic energy source. And, unlike wind or solar power, in-stream and ocean current hydrokinetic power projects can operate in baseload fashion, providing power over 99% of the year. A 2007 study by the Electric Power Research Institute (EPRI) found that the U.S. could develop at a minimum 13,000 MW of river (in-stream) and ocean-based (wave, current, tidal) hydrokinetic power by 2025. In short, there is an abundance of hydrokinetic potential in the U.S. ripe for development. A current update to that study estimates that 429 TWh could be provided each year in the U.S. alone.

In addition to our hydrokinetic resources, the U.S. is in a position to develop new waterpower resources at existing infrastructure and without building any new dams. According to the same EPRI study, there are roughly 7,300 MW of waterpower that could be developed at existing hydro sites or non-powered dams

by 2025. Combine that with the above mentioned hydrokinetic potential, the U.S. is sitting on over 20,000 MW of unused waterpower capacity, which is roughly the same amount of power provided by today's wind industry.

Lastly, the Department of Energy in an April 2004 report estimated that there are still over 175,000 MW of low head hydropower opportunities in the U.S. Combined, this generation would offset over 200 new large coal plants and increase the renewable output of the country to well over over 20 percent of current demand in a way that ensures protection of the environment and our marine life. Enacting clean energy policies, such as carbon legislation that values non-carbon emitting resources, will ensure that these megawatts are developed, which will help control greenhouse gas emissions and create an abundance of American jobs, bringing new life and innovation to our struggling American economy and job base.

Green Job Creation

I was asked to today focus on job creation that could result in the clean energy sector as a result of climate policy. The best way I can do that is to discuss the jobs that Hydro Green Energy has created at its first project, and to discuss what we expect in terms of future job creation as our company grows. What I will discuss, I will offer to the Committee, is only a fraction of what could be done with an aggressive expansion of new waterpower technologies in the United States. I would also like to inform the Committee that Navigant Consulting has been hired by a CEO Leadership Council within the National Hydropower Association to perform a jobs study, which should be available in a matter of months. We will be eager to share these results with Congress and this Committee in particular.

As I mentioned earlier, the development of the Hastings project resulted in a number of exciting, high-paying employment opportunities in several states. It also created work for those who had lost work to overseas competition. The employment activities that resulted from the Hastings project will be replicated on a much larger and more permanent scale as Hydro Green Energy's project portfolio grows. In other words, despite the great economic and employment uncertainty facing the United States workforce, Hydro Green Energy is providing work for Americans, creating local economic development and presenting exciting new opportunities to America's skilled workforce. And, we are eager to create more employment and economic activity.

Below are the brief highlights, by company and type of work, of the "green collar" employment activities (61 jobs in total) resulting from Hydro Green Energy's historic first project in Minnesota. As you can see, we created jobs in several states from a variety of skill sets.

- **Aluminum Alloys** (*Sinking Spring, PA*) – Foundry that handled the pouring of the blades for Hydro Green Energy's patented turbine.
- **TC/American** (*Waite Park, MN*) – Steel fabricator for the hydrokinetic units' superstructure. Turbine and array assembly.
- **Portable Barge Service** (*Newport, MN*) – Surveys, on-site final assembly and installation of the hydrokinetic power units. O&M service contract.
- **RPS Barge Company** (*Bagdad, KY*) – Barge manufacturing for hydrokinetic turbine array.
- **Manley Brothers** (*Valley Park, MO*) – Marine engineering and installation, with a focus on in-river industrial applications.
- **AA Precision Machine Company** (*Fall River, MA*) – Manufacturing and machining of the turbine shafts and hubs.
- **Normandeau Associates** (*Bedford, NH*) – Environmental consultants to Hydro Green Energy. Performing comprehensive fish mortality studies, mussel control plan, avian studies and water quality monitoring.
- **Concepts NREC** (*White River Junction, VT & Woburn, MA*) – Assisted in the final design of Hydro Green Energy's patented hydrokinetic system, comprehensive research & development on hydrokinetic systems, performed extensive engineering and modeling work and helped lead the entire fabrication and installation process for the Hastings project.

As stated above, these types of jobs will be replicated on much larger scale as future project sizes grow and as our project pipeline gets built out. The company also plans to hire as many as 20 employees in 2009. Today we are a company of three, and two years ago we were a company of one.

As I alluded to earlier in my testimony, Hydro Green Energy is presently developing Lock+ power projects. For our Lock+ technology, we have assembled job figures for those types of projects. At every project we build, and we are today developing seven projects, the expected jobs, by category and number of jobs, are as follows:

- Project Management and Operations (cost controls, quality assurance, scheduling, logistics): **11**

- Modeling and Design Phase (engineers and analysts – structural, power, mechanical, electrical, civil; independent review on all design features): **14-19**
- Procurement Phase (materials buyers): **5**
- Fabrication Phase (foundry workers, welders, machinists, steel fabricators, assembly, testing): **75**
- Installation Phase (construction workers, electricians, water transportation, site prep, cranes, foreman, QCIP manager, electrical, IT): **60**
- Operations, Maintenance, Information Processing and Security: **5-10**
- General Administration and Regulatory: **10**

As you can see, at each Lock+ project, we will create approximately 180 to 190 jobs. These jobs range in diversity and skill set, but they are all well-paying and desired jobs. For our seven current projects, we will create as many as 1,330 jobs. As I stated earlier, I am only highlighting to the Committee what Hydro Green Energy expects to accomplish on the job development front. There are scores of companies across the waterpower sector and other renewable energy sectors looking to do the same.

Policies That Will Ensure Aggressive Development of New Technologies and New American Jobs

Waterpower is emissions-free, renewable, reliable and domestic. If fully exploited, America's waterpower resources will substantially bolster the United States' efforts to reduce the impacts of climate change. Properly drafted carbon legislation that provides economic benefits to carbon-free technologies like ours will serve as a driver for economic growth and power project development. Such policy will also help coax some of the venture capital and debt finance that today is being held back from the marketplace. Even the mere idea of carbon policy being enacted this session is causing some of the largest power companies in the U.S. to enter into conversations with Hydro Green Energy about potential project partnerships. These are companies that would not talk to us several years ago, but I think we are all encouraged by the dialogue now taking place.

In order for promising clean energy technologies to rapidly advance in the near term, which is clearly in the interest of the U.S., federal incentives and policies are needed. The *Energy Independence and Security Act of 2007*, the *Emergency Economic Stabilization Act of 2008* and the *American Recovery and Reinvestment Act of 2009* all made tremendous strides in ensuring a more robust future the waterpower industry. Below, however, are additional policies that Hydro Green Energy believes Congress must adopt to further the role of waterpower technologies in our national energy strategy. While I understand that the focus of today's hearing is on climate policy (which I do mention), all of the policies mentioned below

will help drive activities to address climate change. Carbon legislation, while necessary and important, is not the only driver.

- Inclusion of all hydrokinetic power technologies, incremental hydropower and waterpower technologies at non-powered dams in climate change legislation;
- Section 45 Production Tax Credit parity for qualifying waterpower technologies of ARRA 2009;
- A long-term extension of the PTC for qualifying waterpower technologies*;*
- Inclusion of all hydrokinetic power technologies, incremental hydro and waterpower technologies at non-powered dams in a federal Renewable Portfolio Standard (RPS);
- A long-term extension of Clean Renewable Energy Bonds funding;
- Tax credits for companies investing in studies or monitoring programs that gather environmental performance data at installed new waterpower technology power projects;
- Significant research, development and deployment dollars from DOE specifically dedicated to advancing new waterpower technologies, with a special focus on better understanding environmental issues; and
- Compression of the licensing process for new waterpower technologies and compression of Clean Water Act Section 401 Certification timelines by 50 percent.

Closing

I want to again thank the Committee for inviting me to testify and for its attention to the issues before the Committee. It was a great pleasure to appear before the Committee today and Hydro Green Energy stands ready to work with the Committee in the future as its moves forward on crafting new energy and environmental policies. This Committee knows that America is in a position to lead the world in clean energy technology development, but only by taking more decisive action we will catch and surpass our Canadian and European counterparts in waterpower technology development. And by doing so, we will create an abundance of new jobs and help better tackle the environmental issues we face as a country in an increasingly competitive world.

Scores of companies like Hydro Green Energy are fighting every day to make progress and to provide the solutions you seek as federal policymakers. As I stated earlier, the adoption of aggressive policies at the federal level that recognize and financially value carbon-free energy sources will only serve spark the aggressive expansion of innovative clean energy companies and renewable energy power projects nationwide, creating a significant number of energy, environmental and economic benefits.

Thank you for your time.

Contact Information

If the members of the Committee or their staff would like additional information, please do not hesitate to contact Hydro Green Energy at your convenience. Contact information is found below.

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