"Climate for Innovation: Technology and Intellectual Property in Global Climate Solutions" in the House Select Committee on Energy Independence and Global Warming

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Testimony of
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Introduction

Chairman Markey, Ranking Member Sensenbrenner, Members of the Committee thank you for the opportunity today to present the venture capital industry's views on the importance of intellectual property protection to the pioneering investors and innovators in clean technology and other science-based companies in the United States. Often these are the companies which transform the research of our great universities and national laboratories into commercially viable products that change the way we work and live. The path to commercialization is long and arduous. It is paramount to adequately reward those who travel this path so that they will continue to take the risks necessary to maintain a vibrant innovation ecosystem. Intellectual property protection is a critical ingredient to this process.

I am the Co-founder and Managing Director of ARCH Venture Partners, one of the most prolific developers of early-stage university and national laboratory start-up companies in the world. Over the course of more than 20 years, we have created over 130 companies from basic research at academic institutions, including leading companies in biofuels, solar energy, education, semiconductors, software, internet, personalized medicine, stem cells, and biomedicines. These companies hold over 1200 U.S. patents and patent applications. ARCH was founded by Walter Massey, former head of the National Science Foundation and President of Morehouse College, now Chairman of Bank of America, and Steven Lazarus, former Associate Dean of the Chicago Booth Business School at The University of Chicago. We have offices in San Francisco, Seattle, Austin, Boston, and Chicago.

Innovation, Venture Capital, and Economic Growth

The United States is propelled by innovation. Our pioneering spirit has historically set our economy apart from those of all other countries. We commend our government for understanding the dynamics associated with scientific discovery and supporting these efforts historically through policy making. As a nation, we invest over $100 billion of taxpayer money every year into research at our universities and laboratories. This work takes place even as large companies in the private sector reduce their fundamental research investment. It is imperative to feeding our discovery pipeline here in the U.S. and worthy of substantial protection.

The venture capital industry also plays an important role in this innovation life cycle. Our job is to invest substantial sums of money, mostly from institutional investors, into those innovative ideas with the most promise to become commercially viable. We seek out these ideas from labs, identify those which hold the greatest potential, and build management teams and companies to bring the product to market.

Our model of innovation works well. The venture capital ecosystem, in combination with our universities and national laboratories, have now created companies that represent more than 12 million jobs and equate to 21% of U.S. GDP. These companies, all which were once small start-ups, comprise many of the most innovative entities in the United States including Genentech, Amgen, Intel, Google, and Cisco. In the past three decades we have invested billions of dollars into companies operating in the information technology and life sciences sectors.

Within the last three years our industry has committed itself to investing in the clean technology sector, building companies in the renewable energy, conservation, purification, and power management spaces. Just as we built the biotechnology, semiconductor and software sectors, we hope to do the same by creating a clean technology economy here in the United States and abroad. In 2008, venture capitalists invested more than $4 billion into clean tech start-up companies, making it the fastest

growing industry segment for the year. The collaboration among venture capital funds, start-up enterprises, and university research continues to be the envy of the world and one of the primary keys to our economic future.

Risk and Intellectual Property Protection

Despite our successes, risk is a significant part of our equation. Our investment time horizon is long term, with most companies requiring continuous capital infusions for a period of 5-10 years. During that time, we must navigate technology and market risks, regulatory approvals, and competition. To wit, approximately 1/3 of our companies fail. However, those that succeed do so in a large enough way to balance the failures. We rely on the successes to make a return for our investors so that we may continue to operate and fund new deals.

Intellectual property is the key to this process. Our investment model is based on the ability of companies to become profitable and ultimately stand on their own without our capital. Patents help to significantly mitigate the risk of bringing new inventions to market and allowing companies to reach this goal. In fact, private venture capitalists invest largely based on the strength of those patents. Without these patents, there would be no venture capital investment, leading to no job creation, no energy independence, and no breakthroughs in climate change. The game is ours to lose.

Now is a critical time to safeguard our intellectual property policy. Out of the many patents that will be filed in the coming years, there will be a handful of world-changing inventions that can crucially alter the course of our future. These are the jewels we need to protect and include inventions that:

- reduce carbon or allow for its reuse;
- relieve us of foreign oil dependence;
- prevent and treat pandemics;

- address chronic diseases and life threatening conditions including diabetes and Alzheimer's, saving 40% of the future Medicare budget; and
- allow us to use electronic information more efficiently and effectively across all industry sectors.

Supporting Clean Technology Investment

As it relates specifically to clean technology, the issue we need to collectively explore is how to protect the truly pioneering inventions that we need in order to continue to lead the world scientifically and economically, while distributing innovations globally. We can all agree that it is in everyone's best interest to widely deploy ground breaking green technologies; yet we must temper this enthusiasm with the reality that no investor in this country will put money into an innovation that is going to be quickly copied as soon as it hits the market.

Pioneering clean-tech inventions requires a huge investment upfront, and relies solely on original intellectual property protection to attract investors. By their very nature these inventions challenge entrenched industries and markets, and take orthogonal approaches to intractable societal problems. One example of this dynamic is Sapphire Energy's algae oil. This company is working on a true breakthrough, made by harnessing the energy from the sun and capturing CO2, to grow algae on non-agricultural land using non-potable water to make gasoline, diesel, and jet fuel. Sapphire has revolutionized plant biology to coax algae into making "green crude," which can be refined at scale, just like crude oil. Over 200 patents and patent applications back the technology, and it has attracted some of the largest investors in the world. This money is invested solely in the breakthroughs that are protected by those patents.

Sapphire is currently hiring hundreds of employees to scale up their process to produce billions of gallons of crude in the coming decade. Their first task is to help to shore up our energy security here in the United States. Their plans also contemplate a number of partnerships in the developed and the developing world. We can make poor countries oil

exporters with the right private partnerships. All these partnerships are dependent on patents, and the investment needed will be in the tens to hundreds of billions of dollars. The only way to attract that type of money into the developing world is with patented technology backed by the U.S., or the investment will never come, and innovation will not happen.

Without significant venture capital investment of $100,000 to $150 million, these promising technologies such as Sapphire Energy that underpin the future of our country and our world will not be developed. Only after these seed and early stage investments have demonstrated the viability of an idea can they attract even larger commitments, which can range from $200 million to billions of dollars. Intellectual property is a requirement for obtaining this level of investment. The same applies in foreign lands, where we need the support and strength of the U.S. government to prevent the loss and outright theft of intellectual property, and to encourage forward-looking government-to-government cooperation. Essentially, the wrong policies could increase the original business risk to the point that the first investment is never made as the risk becomes too great that the intellectual property would not be protected. In addition, large companies may take advantage of the increased market power they gain with weaker intellectual property laws and delay investment in small companies. Thus, these technologies may never get to scale and ultimately benefit the public.

Putting Forth the Right Policies

Policy making has a large impact on our very small industry. The type of seed venture capital and pioneering work we do is already a tentative business, and small perturbations in the system can have large effect in investment, innovation, and U.S. competitive advantage. We are not immune to the recession. Many predict that as much as half of U.S. venture capital firms will disappear as a result of the current downturn. The venture industry needs public policies that continue to support our investment in the riskiest but most promising ideas our country's innovators have to offer.

Like many effects of policy, the business reality of any weakening of intellectual property laws, talk of compulsory licensing, and increasing taxes on early-stage investors, will take effect immediately in the game theory of the negotiation. In the meantime, the uncertainty and tilt toward lower innovation and entrenched market leaders, will serve to quash the breakthrough innovations and solutions we need to solve the pressing problems we face.

Imagine a world where we share our inventions with other countries, and because of weakened patent laws, other nations are able steal the United States' scientific jewels. Or a world where we allow large entrenched corporations to run over the small innovators who lose their one competitive advantage because of weakened patent laws. This is our potential trajectory if we give way to less intellectual property protection. We must support innovation by ensuring that inventors and investors are protected and rewarded for the risks that they take over a long period of time.

Understanding that it is going to take hundreds of billions of dollars to bring these technologies to market, we know that private industry will not invest in innovation that will be made available to everyone. And it is unlikely that the governments' will come up with the hundreds of billions in place of the private sector.

If the United States is going to be the assumed innovator in clean technology, we need to create an enabling environment that takes advantage of this country's innovators and the speed of privately developed energy solutions. We must also foster the ability of governments to cooperate to speed the applications toward certain problems, in certain geographies, or in the developing world. There already exists an established set of universal intellectual property rules by which all other governments should play. The missing ingredient for the developing world is a set of incentives for new technologies to be deployed there, like a World Green Bank, modeled on the U.S. Green Bank that can help finance alternative energy projects in the developing world. The voluntary programs will be more effective, attract more private capital to developing countries, and will not derail the cycle of innovation.

Conclusion

The necessity for fundamental, not incremental, scientific breakthroughs is increasing. Without major discoveries that change the productivity and economics of alternative energy, our efforts for energy independence and climate control will certainly fail. These discoveries and commercialization are predicated on venture investment. And I can say today with certainty that venture investment would not continue into a space where patents and intellectual property are not protected. The risk is too great even for the industry that prides itself in taking on many risks to bring innovation to life.

In these hard economic times, we are still the best innovators, and our venture capital industry is the envy of the world. Think about this—venture funded companies in the United States in just the last 40 years comprise almost the GDP of Germany. Our path to a future economy that is sustained by high productivity gains and the creation of new industries is clear. But we must think about the health of this fragile innovation infrastructure and ensure that our policies protect it. As we consider intellectual property laws, patent protection and other legislation, we must continuously ask ourselves how it affects investment as the harm of unintended consequences to the most competitive and important industries could be real and fast, ceding strength to foreign competitors.

We applaud the Committee for proactively seeking the right path to continued innovation in the U.S. and exercising your collective power to stand up for the intellectual property that underpins United States competitive advantage. We truly have an historic opportunity to innovate and lead the world in the creation of a new U.S.-led industry, with million of jobs here at home, positive global environmental impact, and enhanced energy security. Your actions or inaction will have real effects on the survival of clean-technology and other innovative industries in their tentative relationships with the goliaths of the energy world and foreign countries.

Whether you believe that climate change is the imperative, or that energy security is the key, innovation solves both problems. We all have a stake in protecting it.