TESTIMONY OF
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Introduction

Good afternoon, Chairman Bingaman, Ranking Member Domenici and Members of the Committee. My name is John Denniston. I am a partner at the venture capital firm Kleiner Perkins Caufield & Byers. I testified before this Committee in March of last year, and am honored to return today to share my views about how federal policy might support the financing and development of clean energy technologies.

Together with most of the rest of America, venture capital and technology industry professionals - Democrats and Republicans alike - are deeply concerned about the risks posed by our energy crisis, encompassing climate change, the rising scarcity and cost of fossil fuels, and increasing threats to our global competitiveness. At the same time, our industry is in a unique position to recognize the opportunities these challenges present to build our economy, creating jobs and prosperity.

Founded in 1972, and based in California's Silicon Valley, Kleiner Perkins is one of America's oldest venture capital firms. We have funded more than 500 start-up companies, backing innovative entrepreneurs in the digital, life science and green technology industries. More than 170 of our companies have gone public, including Amazon.com, AOL, Compaq Computer, Electronic Arts, Genentech, Google, IDEC Pharmaceuticals, Intuit, Juniper Networks, Millenium Pharmaceuticals, Netscape, Sun Microsystems, Symantec, and VeriSign. Today, our portfolio companies collectively employ more than 275,000 workers, generate $90 billion in annual revenue, and contribute more than $400 billion of market capitalization to our public equity markets.

Kleiner Perkins is a member of the National Venture Capital Association and a founding member of TechNet, a network of 200 CEOs of the nation's leading technology companies. I serve on TechNet's Green Technologies Task Force. My testimony today reflects my own views.

You've asked me specifically to address the new energy legislation before you. But before I do, I want to offer an overview of how many of us in the venture capital industry perceive the energy challenges and opportunities facing our country today. I began my testimony last year in a somewhat similar fashion, but at the risk of a little repetition, I believe we must bear in mind the scope of our challenges as we move forward with strategies to address them.

The Energy Crisis

There's a fast-growing consensus among Americans today about the need to confront our three main energy challenges: the climate crisis, our dependence on foreign oil, and the risk of losing our global competitive edge by failing to champion new technologies that are becoming a huge new source of economic growth, jobs and prosperity.

Renewable energy sources – such as sun, wind, geothermal and biofuels – offer this country's best hope of addressing all three of these dimensions, and of helping us rebuild our domestic economy and regain our edge as an economic superpower.

Climate Change:

Our leading climate scientists predict we have only a short period of time to make dramatic cuts in our greenhouse gas emissions or risk potentially catastrophic climate change. Global temperatures and sea levels are already rising and will continue to do so; the question now is whether we can slow down the projected rate of future increases. Global warming is not a partisan issue: President Bush and both Presidential candidates have publicly declared we must seriously confront our climate crisis. Yet perilously, we have so far failed to move with the requisite speed and determination.

Energy Security:

As for our energy security dilemma, this Committee is well aware that America continues to import approximately 70% of our oil needs. Rapid growth in worldwide energy demand has stretched supplies, causing energy prices across the board – oil, natural gas, coal, and even uranium - to skyrocket. As world population and energy demand increase, there's every reason to believe supply and price pressures will persist.

Global Competitiveness:

Finally, our future prosperity is at risk, and here I speak from very personal experience. As I've traveled on business to China and Europe, I've witnessed how the rest of the world is striving, and often succeeding, to emulate in the renewable energy sector, the technology innovation that has been a hallmark of the U.S. economy and perhaps the single most important driver of our enviable standard of living. Increasingly, entrepreneurs overseas enjoy advantages in the form of determined government policies, including financial incentives and large investments in research and education.

Credible economic studies suggest our technology industries are responsible for roughly one-half of American GDP growth. Our country would look quite a bit different today had we not, several decades ago, become a global leader in biotechnology, computing, the Internet, medical devices, semiconductors, software and telecommunications. And now we find ourselves with a vast new economic opportunity – to grow green energy technologies that seem destined to become the economic engine of the 21st Century. But will America again lead the way?

Renewables: The Opportunities

Moore's Law & The Pace of Technological Progress:

In Silicon Valley, we often refer to a principle known as Moore's Law: a prediction, credited to Intel co-founder Gordon Moore back in the 1960s, that semiconductor performance would double every 24 months. Moore's law underpins the information technology revolution of the past three decades. Better, faster, and cheaper silicon chips led the way, over just the past quarter of a century, from an era of big and expensive mainframe computers to affordable hand-held cell phones that connect us to the Internet and to each other.

At Kleiner Perkins, we believe we're already seeing a Moore's Law dynamic operating in the energy sector, giving us confidence the rate of greentech performance improvement and cost reduction will lead to energy solutions we can't even imagine right now.

Alternative energy is becoming increasingly cost-competitive, as the price of conventional power skyrockets and costs for clean energy such as wind and solar power come down. World-class talent is racing into the greentech sector. And a growing sense of urgency regarding our energy crisis is boosting demand. We're seeing breakthroughs today in a host of scientific disciplines relating to the energy sectors, including material science, physics, electrical engineering, synthetic chemistry, and even biotechnology.

These improvements have occurred over a period of time in which there was relatively little government policy or entrepreneurial focus on these sectors. Solar manufacturers are innovating their way around silicon shortages, with next-generation materials including pioneering thin-film technologies. The agriculture industry is now beginning to produce transportation fuels from non-edible plants. And nanotechnology breakthroughs are creating the promise of new ways to store energy, which will catalyze an electric transportation revolution. Imagine what American ingenuity might accomplish in the future as more and more of our best and brightest devote their efforts to the greentech field!

Renewables: The Challenges

Our opportunities are truly breathtaking. Yet unfortunately, we're moving much too slowly to take advantage of them. Three major obstacles currently impede faster commercialization of renewable energy.

Scarce Research Funding:

American innovators woefully lack necessary funding for basic, translational and applied research in renewable energy. Our leading research institutions are begging for federal funding, and faculty interest has never been keener. Yet at roughly $1 billion annually - most of which is ear-marked - DOE funding is microscopic relative to the problem at hand.

Credit Scarcity:

Many promising new technologies are being delayed or thwarted by the unavailability of commercial loans. In many cases, these new technologies are unproven at scale, and the credit markets are unwilling or unable to assume the risk to help them grow.

Competitive Market Disadvantage:

The high cost of renewable energy sources, relative to the incumbent competition, is the third main barrier to greater capital investment and more rapid adoption of clean power. Why does green power cost more? Primarily because it's so new, meaning it is produced in such low volumes that the industry has yet to benefit from economies of scale, and has only just begun a continuous cost reduction process.

And older power sources have another comparative advantage. Most coal-fired and natural-gas plants were constructed many years ago, and are now fully amortized. That means those facilities' owners no longer need to charge rate-payers for initial construction costs. Clean-power companies, in contrast, still need to include construction financing costs in their customer pricing, putting them at a major disadvantage.

On top of this, government policy to date has provided powerful advantages to fossil fuels and nuclear energy. In some cases, the federal government itself has paid directly for electrical generation facilities and transmission and distribution infrastructure.

Beyond government subsidies, the fossil fuel industry has long benefited by escaping responsibility for the costs of the environmental consequences of its emissions – instead, society has paid the price. Clearly, traditional power sources would become much more expensive, and alternative sources of energy more cost-competitive, if plant owners had to take on the true costs of these emissions.

In the special case of nuclear power, the federal government has for many decades assumed enormous costs for research and development, plant operations, insurance and waste disposal – all of which, if borne by nuclear plant operators, would make this power source a much less viable option.

The Pending Legislation

Overview:

With anxiety growing throughout America about our energy crisis, Congress today has a unique opportunity to tackle the obstacles standing in the way of renewable energy development. I'm gratified to see some of the steps you are considering in this session may do just that.

You have before you two pieces of legislation: the 21st Century Energy Technology Deployment Act (S. 3233), and the Clean Energy Investment Bank Act of 2008 (S. 2730). Each, in its way, aims to bolster domestic energy supplies by increasing private lending activity for energy

technologies. I know I join millions of other Americans in and outside of industry in applauding this basic strategy. But now let's look more closely at the options before you.

Goals

"Goals are dreams with deadlines," writes the author Diana Scharf Hunt. Frankly, the magnitude of our energy problems means we all need to start dreaming some very big dreams. Clearly stating our goals at the outset is the first step toward fulfilling them.

At the heart of the 21st Century Energy Technology Deployment Act is the goal of promoting domestic development of clean, advanced energy technologies. I believe this indeed must be our explicit target. Only by means of a massive deployment of renewable energy can we hope to address all three dimensions of our energy crisis, protecting our environment and enhancing our national security, while at the same time advancing our economy.

For that reason, I advise you to include a succinct preamble in whatever law you approve that defines both this mission and the intended approach. It might read something like this: "The purpose of this Act is to address our three-dimensional energy crisis, encompassing climate change, energy security and American competitiveness, by accelerating private loans supporting the rapid adoption of clean energy solutions."

While there are many details to consider in the legislation, I believe there are two key questions the Committee needs to answer:

- What banking functions should Congress charter the new bank to perform in order to execute on the mission to expand credit availability?

- Which types of energy projects should the new bank target to support?

Banking Functions

Both pieces of legislation before you would create an entity with banking functions to facilitate new energy technology funding. In my view, the best tools available to you are credit enhancement in the form of loan guarantees; the creation of secondary markets; the direct provision of debt-financing; and, in appropriate circumstances, insurance coverage.

Credit Enhancement

S. 2730 provides for loan guarantees backed by the full faith and credit of the Federal government, a tactic I heartily support. Loan guarantees have tremendous potential to help level out the playing field for new energy technologies. In order for the loan guarantee program to be effective, it is critical the guarantees be supported by the full faith and credit of the Federal government.

As I mentioned earlier, a key impediment to more rapid commercialization of renewable energy is the scarcity of debt financing. More available credit would help many emerging green technologies transition to large-scale production. Yet lenders have been hesitant to finance these projects, mostly due to the novelty of the technologies and their lack of a track record. This leaves green entrepreneurs who want to grow fast with the sole option of financing that growth through equity investments. Thus, they start out at a major disadvantage compared to most conventional energy sources, which have historically had easy access to the credit markets.

Loan guarantees would not only eliminate that disadvantage but also help renewable energy projects get more affordable financing terms. That, in turn, would help reduce their production costs, addressing another handicap relative to incumbent energy sources.

Timely government support – be it loan guarantees or even direct grants – can make a crucial difference for emerging energy technologies, as seen in the recent case of cellulosic biofuels. These, as you know, are fuels made from wood chips, switchgrass, and other non-food sources. Last year, in a special appropriation, Congress enabled DOE grants to innovative companies in this field that would have otherwise struggled to obtain debt financing for these new production plants.

Under the existing DOE loan guarantee program, roughly 75% of the guarantees are directed to fossil and nuclear projects. It's not clear to me whether S. 2730 intends to have the newly created bank carry this type of allocation forward. In contrast, S. 3233 sets aside 75% of the new support for breakthrough technologies. S. 3233 introduces an indisputably superior allocation methodology because it optimizes the impact of the legislation across all three dimensions of our energy crisis. If the existing loan guarantee program remains within DOE, I would urge the Committee to take advantage of this opportunity to amend the allocation between industries so it is more in line with S. 3233's method.

Secondary Markets

I see this Committee is also considering creating a secondary market for energy securities, by enabling a new government entity to buy credit instruments relating to clean energy projects. Until now, there has been no secondary market for renewable energy credits. Creating one could help energize investment and innovation.

In a novel feature, S. 3233 goes on to enable the aggregation of loans made by privately-owned lending institutions to residential and small commercial users of distributed generation energy sources (Section 6(e)). I enthusiastically endorse this concept, which gives America's local banks a leadership role in the greentech revolution, while also expanding the pool of low-cost capital that homeowners and small business owners can tap for new clean energy solutions.

Debt Financing

One of the pieces of legislation before you creates a bank that can make direct loans to worthy clean energy projects. While I support giving the bank this capability, I believe you'll make the most progress by focusing attention and resources on the first two tools I've mentioned -

catalyzing the primary credit markets through loan guarantees, and creating a secondary market for clean energy credits.

Insurance

One of the bills before you considers offering insurance to energy facilities. I believe there may be instances in the future where insurance could be a useful tool to address our energy crisis, such as insuring feedstock supplies for cellulosic biofuels producers. However, the legislation is vague on which sectors would be eligible for insurance coverage. I would advise this Committee to be clear in the legislation that Congress does not intend to expand the nuclear industry's already generous federal insurance subsidy under the Price-Anderson Act.

Equity Financing

Another tool before this Committee is to enable the new energy bank to make direct equity investments in projects that have not been able to attract private capital. This strategy may be appropriate in some cases, but if used widely could be inefficient. I'd frankly much rather see the government save its scarce dollars for more pressing needs, such as funding basic research and facilitating credit, and allow the equity markets to serve as a litmus test that alerts the bank to credit-worthy projects.

Prioritization of Energy Projects:

This leads to the question of what kinds of energy projects should be first in line for this new government support. I recommend the Committee clearly direct the new bank to prioritize support for the "breakthrough" energy projects that, despite their risk, offer the greatest potential improvement to our energy crisis.

Impact on Energy Crisis

Performance standards will be essential for project selection, and the bank should obviously favor projects that can deliver the most bang for the buck in terms of all three aspects of our energy crisis: greenhouse gas emissions reduction, providing alternatives to imported oil, and strengthening American competitiveness.

S. 3233 defines the "breakthrough" technologies it prioritizes for support as those having been highly rated by the Advisory Council yet lacking in private investment due to their perceived high technical risk. I heartily support this approach. And I would also strongly encourage you to consider including advanced battery technology and cellulosic and advanced biofuels projects on the list of prioritized projects. Following this agenda, in my view, would help the new law achieve maximum impact.

Development Stage

I know I speak for a great many Americans when I also urge you to prioritize the cleanest and most advanced new technologies, many of which are still in their infancy. It would be a serious

mistake to limit new government support to technologies already in wide commercial use. As I've mentioned above, traditional fossil fuel and nuclear power sources have long enjoyed heavy government subsidies. We need now to level the playing field for the most innovative technologies to unleash power from the sun, wind, geothermal, biofuels, and other renewable sources.

Risk

At issue before you is also the level of risk entailed in projects eligible for government support. Especially in our current economy, it's hard to imagine creating a banking entity that would continuously lose money by supporting only the riskiest projects. On the other hand, if such a bank is set up from day one to generate a profit on all the projects it supports, it will only fund the safest ventures, losing opportunities to back truly breakthrough technologies that will have the greatest impact on the three dimensions of our energy crisis.

My advice here is to steer a middle ground: create a bank with the primary purpose of accelerating the market adoption of breakthrough technologies, which would therefore be expected to lose money on some fraction of those projects. However, the bank could counteract losses by reaping profits through fees, and by issuing some of its guarantees for more proven technologies. It could then use those revenues to cover its losses on some of the more speculative projects.

Conclusion: What More Can We Do?

In closing, I want to emphasize how heartened I am to witness this Committee's resolve to confront our energy challenges. Particularly inspiring is your work on H.R. 6, the Renewable Fuels Standard, and the recent enhancement of CAFE standards.

Even so, it's no secret we need to do much more so we can move ahead with a speed and scale commensurate with the scope of our energy crisis. In that spirit, I would like to offer five recommendations outside of the scope of this hearing:

1. We simply must put a price on carbon. And I would urge you, even as Congress deliberates carbon cap-and-trade legislation, to consider the additional potential merit of a carbon tax, as a straightforward signal to the markets.

2. It is also imperative that we substantially increase Federal funding of renewable energy research and development in American research institutions.

3. We need to stop the waste in the American energy system. This is one of the specified goals in S. 3233, but it cannot be overemphasized. Energy efficiency is America's hidden powerhouse, with recent estimates that up to 50 billion barrels of oil could be saved between now and the year 2030 with sustained attention to investments in new technologies and simple retrofitting of buildings.

4. Let's also move forward with other overdue policy changes, such as creating a national renewable portfolio standard and extending federal tax credits - ITC and PTC - for clean energy.

5. More broadly, we must resolve to give our clean energy campaign an appropriate level of attention and resources. You've heard talk of a program the size of the Apollo and Manhattan projects. Frankly, we need something much larger. And because this kind of commitment won't be free of cost or sacrifice, I suggest we also find more effective ways to communicate about our energy challenges and opportunities with the American public.

   I'd like to suggest one such strategy: a DOE dashboard to monitor our national energy transition. The dashboard would measure greenhouse gas emissions, the share of U.S. energy consumption powered by imported fuel, U.S. market share of the global renewable energy industry, and Federal funding for renewable energy research. Updated monthly and widely disseminated, this tool would remind Americans of the government's resolve to make progress in this vital area, while encouraging public participation.

Once again, I want to thank the Committee for inviting me to share my views with you. I look forward to today's hearing and to learning more about how we can work together to build a more secure future for America and the world.