

**COMMITTEE BRIEFING**  
**"Investing in Green Technology as a Strategy for Economic Recovery"**  
**Comments by John Doerr**  
**Kleiner Perkins Caufield & Byers**

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## Investing in Green Technology as a Strategy for Economic Recovery

Thank you, Madam Chair and Senator Inhofe and distinguished members of the committee. Thank you for your leadership on this vital issue and for inviting me. I look forward to working with you, the Congress, President-elect Obama and his energy and economic teams.

I am pleased to follow my friend, Tom Friedman, who is truly a great American. It is an honor to be here with him.

I am John Doerr, a partner at the venture capital firm Kleiner Perkins Caufield & Byers. The topic today is investing in greentech to create jobs—and I'll add to establish America's leadership in green technologies, because that is not assured.

At Kleiner Perkins, we invest money from America's great universities and foundations to help entrepreneurs build new businesses and even whole new industries. Since 1972, we have helped entrepreneurs create almost half a million new jobs, mostly in the US. In the past 5 years, we've invested \$600M in 45 new greentech ventures. And in the next 2 years, we expect to invest in at least 40 more.

**Today America is confronting three interrelated crises: an economic crisis, a climate crisis, and an energy security crisis.** Our best response to all three is a bold, coordinated campaign of **investment** and **incentives** to accelerate green **innovation**. And in doing so, to ensure America becomes the worldwide winner in the next great global industry: green technologies.

Forgive me now for being blunt: what we've been doing is NOT ENOUGH. We must act now, with SPEED and SCALE.

With respect to SPEED, scientists say the next three to five years will determine our chances to avoid catastrophic, large scale, irreversible climate change. Regarding SCALE, the science says we must CUT GLOBAL CO2 emissions to LESS THAN HALF of today's levels. EVEN as the world's economies grow.

Some say we need an Apollo Mission or Manhattan Project. But those were merely multi-billion dollar efforts in single government agencies. They FAIL to convey the SCALE of the challenge, which is to re-industrialize every CITY, STATE, and COUNTRY.

Here's the scope of the problem: Figure 1 of the handout shows US energy flows. The left side shows energy sources and the right side shows energy uses. More than \$1T a year flows through this diagram. Renewable energy comprises only 6% of total energy sources, while almost 30% of our energy comes from overseas sources. In 2007, we shipped nearly a billion dollars a day to other countries for oil.

As our friend Al Gore says, "We're borrowing money from China to buy oil from the Persian Gulf to burn it in ways that destroy the planet. Every bit of that's got to stop."

We've lived with this fossil-based energy system for so long, it's difficult to imagine anything else. But here are some previews of a greener future, told in three stories about innovative ventures.

The Ausra story is one about the potential of advanced solar thermal technology to produce utility-scale electricity [See figure 2]. Large fields of movable mirrors covering several square miles reflect and concentrate sunlight onto water pipes, heating the water to drive steam turbines and generate thousands of megawatts of electrical energy.

We found the tiny start-up in Australia. We helped them move to California. And we helped them hire additional world-class engineers and management.

A few months ago, Ausra turned on the first new solar thermal power plant in California in nearly 20 years. Ausra also has a long-term contract with PG&E to supply almost 200 MWatts in Central California and its costs are the cheapest of any utility-scale solar technology. And with further advances, we believe it will compete with coal-fired power plants.

Over the next several years, Ausra plans to build 2GW of solar power plants, generating 4,000 construction jobs, 1,000 operational jobs, and clean green power for over 300,000 American homes and avoiding 2.5M tons of annual CO2 emissions.

The second story is about Silver Spring Networks and the unified national smart grid. Most of us have no idea how much electricity we are using – we simply don't have the information. All we get is a bill each month with a single demand for payment. I know far more about my daughter's text messaging from our phone bill than I do about our family's electricity usage. And that ought to change. Research shows that consumers save 5-15% of their energy costs when they get basic details on their energy consumption.

Silver Spring Networks works with utilities to build and install a digital network that allows consumers and utilities to monitor and control their electricity usage to reduce wasted energy—and CO2 emissions--while saving money in the process. In just two years, Silver Spring has networked more than 300,000 customers. They have signed contracts with two of the largest utilities - PG&E and FPL - to network 10 million homes, and they are in advanced conversations with others about another 10 million homes. The potential US efficiency savings are 100MMT in CO2 emissions and more than \$16 billion. California's experience suggests that the smart grid could generate a half million new jobs. And a nationwide roll-out of the smart grid could create an additional 280,000 direct jobs over the next 4 years.

Our third story is about advanced batteries, from a new venture still in "stealth mode." So I can't name it today. But I can say the company's breakthrough creates stable, durable lithium ion batteries with higher effective storage capacity. The result is electric vehicles will be able to travel twice as far, and eventually three times as far, to over 100 miles before recharging.

Batteries are to the electric and hybrid cars of the future what the microchip is to the personal computer—the heart and soul of the machine. So battery breakthroughs are a holy grail of greentech. Again, we found this technology and scientists outside the US, but we persuaded them to build manufacturing plants and create thousands of jobs in the Midwest. This company will ship batteries at the end of the year. This technology could be a key driver for the electrification and revitalization of our automotive industry, helping us retain and create many jobs.

Notice the trend here. The technology for two of these ventures came from outside the US. In fact if you list today's top 30 companies in solar, wind and advanced batteries, American companies hold only 6 spots. That fact should worry us all.

We won the space race with the Soviet Union. Now, as Tom Friedman says, we're in an Earth Race with other nations to see who can invent the technologies so men and women can stay on Earth. And we're not winning.

But what I've learned over the years is to never underestimate the power of entrepreneurs. Entrepreneurs do more than anyone thinks is possible with less than anyone thinks possible.

America must bet more on its entrepreneurs. Here are more plans of the greentech entrepreneurs who are trying to build the Amazons and Googles of greentech.

**Entrepreneurs** are working today on advanced 3G solar PV cells that should be meet or beat today's electricity costs all over the country instead of PV that only works with subsidies and in the sunny Southwest.

**Entrepreneurs are designing** new wind turbines that generate electricity more cheaply than a new coal-fired power plant.

**Entrepreneurs are** converting millions of tons of municipal waste into valuable and clean electricity and fertilizer instead of dumping it in landfills. INSTEAD of dumping CO2 into the atmosphere, or trying to pump and sequester it underground, **entrepreneurs are finding ways** to use it as a key ingredient for buildings, roads, and other infrastructure.

**Entrepreneurs are** designing solid-state lighting that is twice as efficient as compact fluorescent bulbs for the same cost, with double the lifetime and no mercury.

**Entrepreneurs are working to make** next generation fuels from available, renewable, cellulosic sources instead of importing overseas oil or competing for foodstock to make ethanol.

Not all of these entrepreneurs will succeed.

**But imagine if** half of our cars were powered by **electricity instead of imported gasoline. Or** half of our homes and businesses were powered by homegrown American sunlight and wind **instead of natural gas and coal.**

The good news is we're funding all these entrepreneurs, right now, right here in America, and they are working around the clock to make this happen.

## **POLICIES TO ACCELERATE COMMERCIALIZATION AND MARKET ADOPTION**

How DO we make all this happen? Entrepreneurs and venture capitalists can't do it alone. We need a few vital policies that will drive investment, innovation and jobs in greentech. There are lots of good policies.

Here are five that matter most.

### **NUMBER 1. Unified National Smart Grid.**

We will invest hundreds of billions in national infrastructure to jumpstart our economy. NOW is the time to build the infrastructure for widescale deployment of our renewable energy sources. Why would we miss this opportunity to build a unified national smart grid?

Updating our grid with advanced low-loss, long-distance transmission capacity and "smart" features will save money, increase reliability and protect consumers from outages, and make possible a clean electricity system. It will connect renewable power from where it is generated to wherever it's needed, whenever it's needed. Just like the interstate highway system and railroads before it, investing in modernization of the grid will create thousands of jobs for American workers.

### **NUMBER 2. Put a PRICE on CARBON and a CAP on Carbon Emissions. Pass a 100% REFUNDABLE Carbon TAX**

This is THE over-arching policy. We need to ACCOUNT for the TRUE COSTS of emitting greenhouse gases. We can't continue EVERY DAY dumping 70 million tons of CO2 into our atmosphere as if it is some kind of a FREE, OPEN sewer.

I want you to know that I favor a cap and trade system AND a 100% refundable carbon tax. A cap and trade system could be "plug compatible" with the carbon commitments and trading systems of other nations. And a carbon tax which is 100% refunded to taxpayers, which is simple and swiftly implemented. Though I understand the political difficulties with the latter.

A price on carbon will propel carbon-less innovations like Ausra's, solar cells, wind turbines, CO2 materials, and countless others to market at scale more quickly.

As GE's Jeff Immelt says, BUSINESSES expect a price on carbon, and INVESTORS want clarity and certainty. We look forward to the leadership of this committee on this vital issue.

**NUMBER 3. We need a National Renewable Portfolio Standard.** We need a nationwide policy to encourage renewable energy. 24 states now have renewable portfolio standards. This has created a vibrant, competitive industry, stimulating some \$65 billion in expenditures. A nationwide standard will allow faster deployment with more scale and more jobs. DOE projects a 20 percent RPS by 2030 would create 500,000 jobs, save consumers \$128 billion through lower natural gas prices, and cut greenhouse gas emissions as much as taking 140 million automobiles off the road.

A national RPS would speed new energy solutions like Ausra, solar cells, wind turbines and others, to take their innovations to market more quickly.

**NUMBER 4. Utility regulations (and incentives) to drive efficiency, decoupling**

We need to UNLEASH the utilities so THEY can DRIVE and INVEST in efficiency. Utilities have vast cash flows, low cost capital and 100% market penetration. They should be our powerful partners.

In California alone three utilities will spend \$3 billion on customer energy efficiency in the next 18 months. Why? Because it is the cheapest way to keep our buildings warm and lit, keep our factories running. And because the California PUC gave them the right profit incentive to find those opportunities. Over 20 years, California's efficiency programs have saved \$56B and created 1.5M jobs.

Get this single federal policy right, and you will create the biggest, fastest, and energy efficient engine for new jobs: for contractors, builders, engineers, project managers, and more.

**In addition to national policies, we need funding.**

**NUMBER 5. Let's get serious about funding R&D and D at scale.**

We need more Federal funding for basic research. Today, with only a few exceptions, the DOE funds little energy research in American universities and less than \$1B for all renewable energy research.

The second D in R&D and D is for **Deployment**. We need deployment. At scale. With today's broken credit markets, it's more important than ever to fund early deployment,. America needs Federal grants and loan guarantees to show these technologies will scale. Streamline the process, allow riskier bets and help get new technologies to market.

Tax incentives for renewables and efficiency are another must for these companies to move and scale these innovations quickly. Given the earnings hit most companies have taken in this downturn, the recent tax package extension has lost much of its impact. Let's make tax incentives flexible enough to work in our current economy and fully refundable to encourage companies to invest in expensive scaling risks.

So what ultimately is the promise of greentech? 15 years ago there was no web browser. There was no internet at your fingertips. Now, the internet has transformed our lives: how we learn and inform, entertain, communicate and conduct commerce.

Led by American innovations, the IT revolution has created a whole new way of conducting commerce, whole new industries, and a whole new Internet Economy. Today, the Internet economy is estimated at \$1T, with 1.5B internet users worldwide.

Energy is a \$6T market with 4B users of electricity. It is the mother of all markets, perhaps the largest economic opportunity of the 21<sup>st</sup> century. With your policy leadership America can lead the ET revolution and create millions of new green technology jobs and industries and repower America's economy.

There are other ways to create jobs. But by investing in the technologies and entrepreneurs to build American leadership in the New Green Economy we have a unique opportunity: we can simultaneously address the economic crisis, the climate crisis and the energy security crisis. What is at stake is whether America will be the worldwide winner in the next great global industry, green technologies.

This is our time. This is our chance.

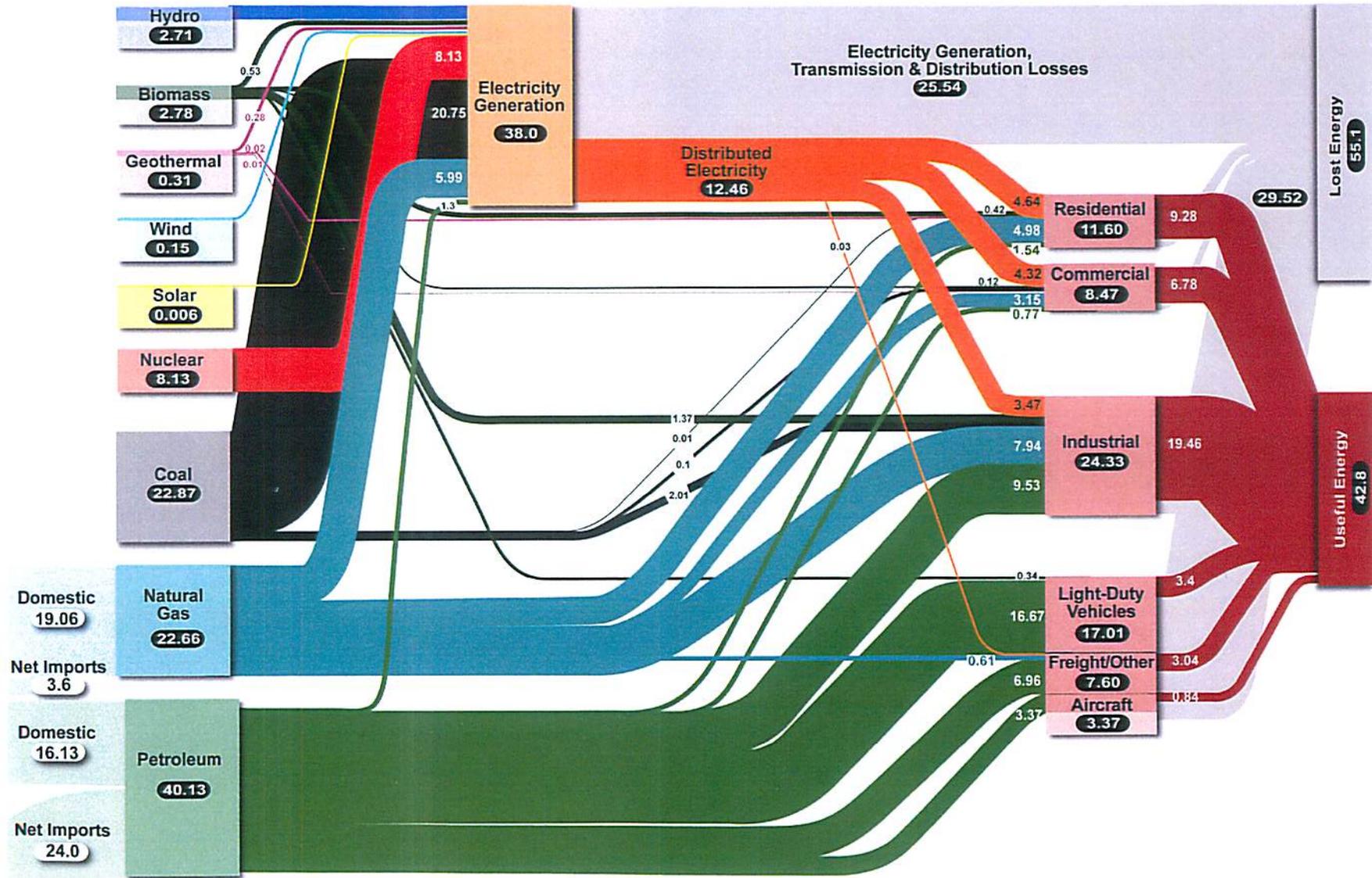
With your leadership we can do this.

Yes we can. Yes we must.

Thank you.

Figure 1

# U.S. Energy Flows (Quads)



Source: LLNL, 2002



Figure 2: Ausra Advanced Solar Thermal Electricity Generation

## Greentech Policy

1. Unified National Smart Grid
2. Price and cap on carbon and a 100% refundable carbon tax
3. National Renewable Portfolio Standard
4. Utility regulations (and incentives) to drive efficiency, decoupling
5. Fund R&D and D (Deployment)

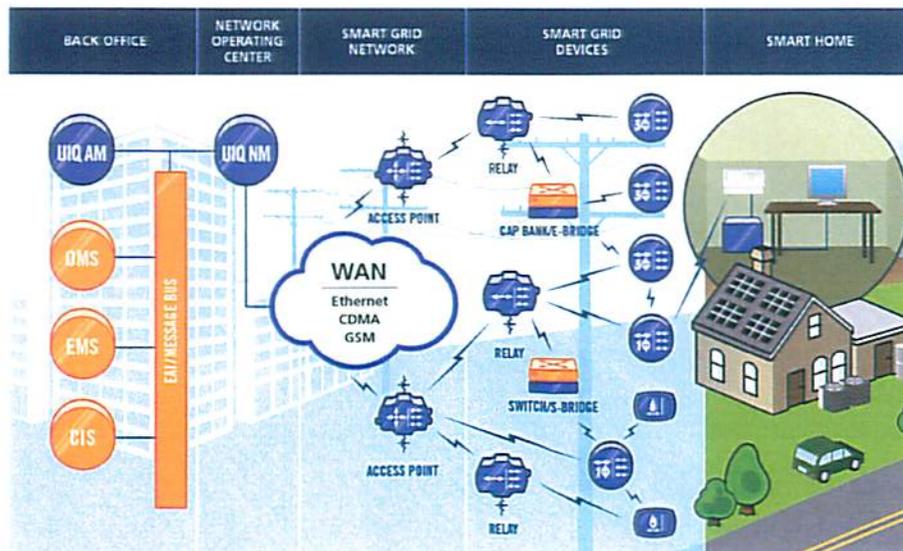


Figure 3: Silver Spring Smart Grid Network

Greentech could be the largest economic opportunity of the 21<sup>st</sup> century. It's an unprecedented challenge that demands great innovation, speed and scale. KPCB has invested nearly \$600 million in 45 greentech companies, including Amyris, Ausra, BloomEnergy, Miasolé, and Silver Spring.

Disruptive innovation, ventures and entrepreneurs are key to meet today's crucial challenges in energy, communications, greentech, life sciences and digital technology. KPCB has helped create over 500,000 jobs by leading investments to found Google, Amazon, Compaq, Genentech, Genomic Health, Juniper, Netscape, Lotus, Sun, Symantec, Intuit and hundreds of others.

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