



**Testimony of Bill Unger**  
**Partner Emeritus at Mayfield Fund**  
**Environmental Entrepreneurs (E2)**

Select Committee on Energy Independence and Global Warming

Good morning Committee Chairman Markey, Ranking Member Sensenbrenner and Members of the Committee. I am Bill Unger, a Partner Emeritus at Mayfield Fund, a venture partnership investing in technology companies since 1970, and a member of Environmental Entrepreneurs (E2), a volunteer organization of business and investment professionals who believe that good environmental policy is good economic policy. I now spend only a part of my time investing in for profit companies, and more of my time as a board member of several non-profit organizations, such as CARE USA, YouthNoise, The Anita Borg Institute for Women and Technology, as an Advisor to and member of E2. I also serve on the advisory boards of the Colleges of Engineering at The University of California at Berkeley and The University of Illinois at Chicago. I appreciate the opportunity to be here today to share my views as a venture capitalist, and as a member of E2, on the creation of new jobs created in “Cleantech” related industries, including jobs created by measures taken in response to threat of Global Warming. In particular, I would like to show how the economic and employment growth of the Cleantech sector is related to a national carbon policy.

I appreciate this opportunity to discuss with you the benefits of investment in Cleantech; jobs, economic growth, and an improved environment. The energy-climate crisis is different in two ways from any other we face. First, although perhaps not yet as painfully visible as Iraq and other issues of the day, it will result in more profound implications for humanity than any other crisis in our civilized history. We will see these implications unfold increasingly rapidly over the next decade—unless we do something NOW. The second difference is that because of the magnitude of the challenge, this New Industrial Revolution, properly addressed could create more jobs, more economic prosperity, more personal, investor and corporate, and public servant satisfaction than has ever been seen before for any number of the exciting technological transitions that have occurred in the past.

I would like to thank the Chairman and members of this committee and members of the House of Representatives for their work in passing the Renewable Energy and Energy Conservation Tax Act of 2008. The extension of these incentives, providing an even playing field, is vital for our nation, and very supportive of the comments I will make today. Hopefully, the Senate will support this legislation, and the President will sign it into law. It is a critical step to solving our urgent and intimately related problems of dependence on foreign energy, economic growth and climate change.



As an example of the even playing field, the Energy Policy Act of 2005 approved subsidies for conventional energy sources of \$6B for oil and gas, \$9B for coal and \$12B for nuclear power, all mature industries. Conservation and alternative fuels were allocated \$2.6B. Since 2005, oil companies have used over \$112B of their profits to repurchase their shares in the public markets. Hardly an even playing field.

Some history of the Venture Capital industry's impact on our economy will set the stage. One of the achievements the venture capital industry is most proud of is our role in job creation. For example, the US semiconductor industry, as of the year 2000, employs 240,000 people in high-wage manufacturing jobs, and had sales totaling \$102 billion in the global market in 2000 (50 percent of total worldwide sales). In 1999, this sector was the largest value-added industry in manufacturing in the U.S. - larger than the iron, steel and motor vehicle industries combined.

The 2005 employment data show a heavy concentration of venture capital supported jobs in the software industry as well, with nearly 860,000 jobs - almost 90 percent of the total jobs in the sector. Venture-backed companies recorded \$210 billion in sales in 2005, which represents more than 36 percent of the industry's total revenues generated that year.

In 2006, venture backed companies provided 10.43 million US jobs and these companies had revenues of \$2.3 Trillion. The revenue represents 17.6% of US GDP. Data from the National Venture Capital Association, (this entire study is at [http://www.nvca.org/pdf/NVCA\\_VentureCapital07-2nd.pdf](http://www.nvca.org/pdf/NVCA_VentureCapital07-2nd.pdf).) shows that at the end of 2006, one ongoing job existed in venture backed companies for every \$28,463 invested in venture capital since 1970, or about 3,500 jobs for every \$100M invested by the Venture Capital industry. (Investment in the 5 years preceding the jobs and revenue measurement date is not included because its effect on 2006 statistics would be minimal.) Furthermore in 2006, these companies generated \$7.87 in revenue for every dollar invested. This is very impressive for an industry that typically invests less than 0.2% of GDP each year.

Looking just at the biotech world, for every dollar of venture capital invested, \$4.43 in revenue was being produced in 2006 (\$83 Billion total). As with VC in general, most of these investee companies failed. For every \$76k of investment, one ongoing job existed in 2006 (and these are typically high-paying jobs). This refers only to the investment economic effect of biotech investment.

Publicly funded research, especially through such entities as DARPA and the NIH have played a crucial role in maturing technology development to the point where the Venture industry, which likes to invest in product development, can fund companies to bring



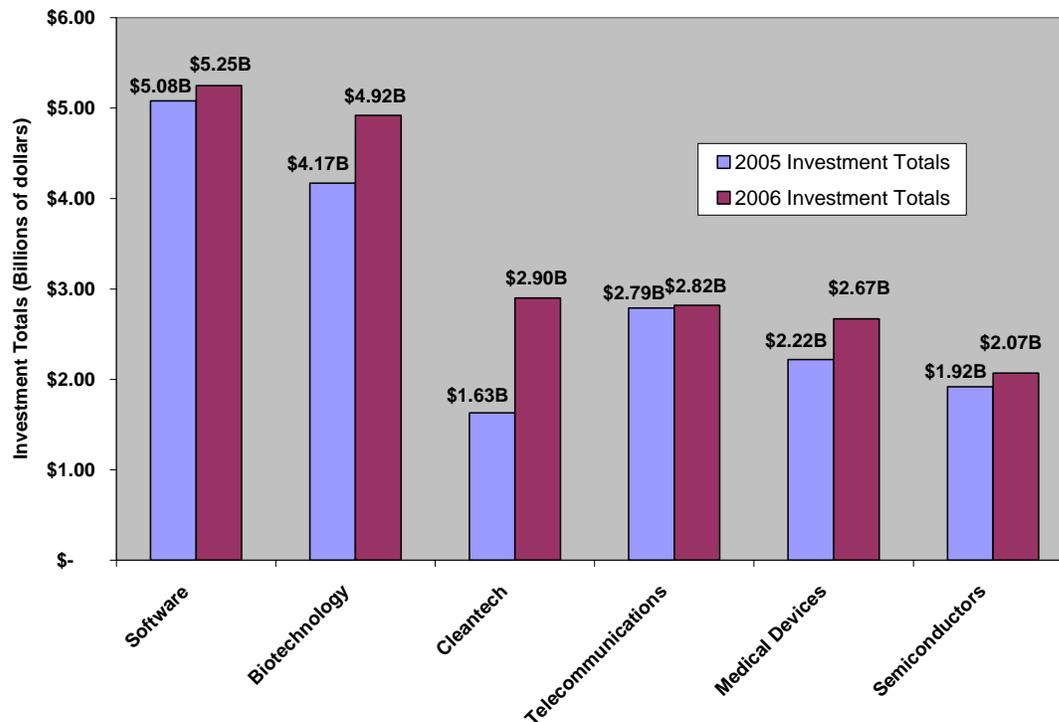
valuable new products and solutions to the market place. At Mayfield Fund, we funded companies such as Atari, Silicon Graphics, Compaq, 3Com, Genentech, Amgen and over 100 hundred other public companies that are examples of this kind of success. In 1990 Mayfield led the second round investment in Sandisk. There were few cell phones by today's standards, no digital cameras, no MP3 players, no Blackberries; a slower, simpler time. All these markets and more were enabled by Flash Memory technology created by the founding team. I suspect there are few of us here who haven't purchased a device with the Sandisk name on it, or a device with Sandisk memory in it. Mayfield was the founding investor in Millennium Pharmaceuticals, which was the pioneering company in genetic design of pharmaceuticals based on an individual's reaction to disease at the molecular level. In the early 1990's, Mayfield funded Heartstream, the manufacturer of the defibrillator machines found now in virtually every public building and every airport. When this company was started, it took a special truck, a suitcase sized \$10,000+ machine, and specially trained technicians to save a life. Today you can buy one on Amazon.com for \$1100.

Mayfield Fund and the Venture industry have seen the unfolding of the semiconductor, software, medical device biotechnology, computer, networking and communications industries, creating millions of jobs and trillions of dollars in revenue.

Cleantech has some important similarities to these success stories, and some differences. Cumulative venture investment in the Cleantech sector of venture investing from 1999 through 2006 totaled \$11.1 billion.<sup>i</sup> So though it is early times in Cleantech investing, by historical standards we think there are encouraging signs for economic growth and job creation.

2006 was a banner year for the cleantech industry – with total venture investments surpassing those of the medical devices, telecommunications, and semiconductor sectors – all of which it had trailed in 2005. Venture investments in cleantech firms in North America totaled \$2.9 billion, a 78 percent increase over the same total in 2005, and a 243 percent increase since 2001. This total also represented 11 percent of all North American venture capital investments for the year (\$27.0 billion),<sup>ii</sup> making cleantech the third largest venture capital category – after only software and biotechnology.

**Top 6 North American Venture Capital Industries, 2005 to 2006 (Billions of dollars)**



In fact, since the economic downturn of 2000-2001, cleantech is one of the few U.S. industries to experience real growth in venture investments. While U.S. venture capital investments as a whole were off by 33 percent in 2006 compared to 2001, investments in American cleantech companies were up 243 percent in that time – more than two and a half times the growth rate of the next strongest industry (electronics/instrumentation) over that period.<sup>iii</sup>

So let's define Cleantech. The cleantech industry encompasses a broad range of products and services, from alternative energy generation to wastewater treatment to more resource-efficient industrial processes. Although some of these industries are very different, all share a common thread: they use new, innovative technology to create products and services that compete favorably on price and performance while reducing humankind's impact on the environment. To be considered "cleantech," products and services must:

- Optimize use of natural resources, offering a cleaner or less wasteful alternative to traditional products and services;
- Have their genesis in an innovative or novel technology or application;
- Add economic value compared to traditional alternatives.



The eleven cleantech categories, as defined by the Cleantech Venture Network, are<sup>1</sup>:

- Energy Generation
- Energy Storage
- Energy Infrastructure
- Energy Efficiency
- Transportation
- Water & Wastewater
- Air & Environment
- Materials
- Manufacturing/Industrial
- Agriculture
- Recycling & Waste

Some findings from the E2 Cleantech Report of 2007<sup>iv</sup> show real progress:

**Finding 1: Growth in cleantech accelerated in 2006, with significant activity in the public markets.**

In 2006, cleantech became the third-largest North American venture capital investment category (11 percent of all venture investments), behind software and biotechnology. Total North American venture capital invested in cleantech companies reached \$2.9 billion in 2006, an increase of 78 percent over the \$1.6 billion invested in 2005.

A significant increase in investments during the second and third quarters of 2006 was driven by capital targeted for companies moving into production. Cilion, Altra, Bloom Energy, Renewable Energy Group, and Nanosolar—all of which represent new renewable energy technology or biofuels—collectively accounted for more than \$600 million in investment in 2006. But this boom can also pose challenges: Companies with new technologies have difficulty accessing capital for manufacturing build-outs. While established technologies such as corn ethanol can rely on debt financing, the first thin film solar or cellulosic ethanol facilities cannot as readily access debt financing because of the higher risks associated with first production facilities. These companies are forced to either raise additional equity capital and/or look to government assistance. As part of the 2005 Energy Act, the Department of Energy granted six cellulosic facilities special financing of up to \$385 million to help build their first production facilities that, in aggregate, should reach 130 million gallons per year.<sup>v</sup>

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<sup>1</sup> Environmental Information Technology (IT) and Enabling Technologies had also been considered cleantech categories by the Cleantech Venture Network until October 2006.



Cleantech is now an established investment category in the public markets. There are multiple stock indices including the Cleantech Capital Indices (CTIUS), WilderHill's ECO, Ardour Capital's Alternative Energy Indexes (e.g. AGINA, AGIGL), and Clean Edge's CELS and CLEN indexes. The 45 public companies that make up the Cleantech Index (CTIUS) have an aggregate market capitalization of over \$300 billion. The performance of CTIUS over the past two years has been strong. In the two years through April 23, 2007, CTIUS has risen 38.9 percent, from 850 to 1180.6. This growth outpaced that of the S&P 500 Index (+28.6%), the NASDAQ Index (+29.9%), and the Dow Jones Industrial Average (+26.1%) over that period. After Sunpower and Suntech went public in late 2005, no fewer than seven photovoltaics companies (Canadian Solar, First Solar, PowerFilm, Akeena Solar, ReneSola, Trina Solar Limited, and Solarfun Power Holdings) went public in 2006. Recent IPOs in the biofuels sector have included Aventine Renewable Energy, Pacific Ethanol, Verasun, and U.S. BioEnergy. Perhaps because of this robust IPO market and the increase in publicly traded companies, the past two years in cleantech investing has moved from a specialty area of investment to one with broad participation from all major venture capital firms.

**Finding 2: Energy prices, entrepreneurial talent, and advances in technology are industry factors accelerating growth.**

Several important factors accelerated cleantech's growth in 2006:

- Sustained high oil prices have driven investor interest in alternative fuels. Most alternative fuel business plans are designed to compete with oil prices above \$40 to \$45 per barrel.
- As the cleantech market matures, it is attracting entrepreneurial management talent from other venture sectors – especially from information technology and biotechnology. These experienced entrepreneurs make it both easier to attract investments and more likely the company will develop into a viable business.
- Advances in technologies have been the basis for many new companies, including nano-materials used in thin-film solar and new chemistry in battery technologies.

**Finding 3: Public policies at the national and state level have accelerated cleantech growth.**

National and state policies have provided early foundations for many cleantech sectors, although investors do not expect those policies to continue in the long term. While the federal government has ramped up its efforts to promote ethanol, the current boom is primarily the result of states rapidly phasing out the MTBE gasoline additive and replacing it with ethanol. Venture activity in corn and cellulosic ethanol was a significant portion of investment growth in 2006, and investment in renewable electricity has been



driven primarily by state renewable portfolio standards. Policies that provide long-term certainty are the most successful at driving business investment.

**Finding 4: Climate change is beginning to influence growth in cleantech.**

Many of the biggest news stories of the past few years have been tied directly to extreme weather phenomena – from disastrous hurricanes to record droughts, wildfires, heat waves, and melting polar icecaps. The public has grown increasingly aware of environmental issues, judging by public opinion polls showing rising public concern about global warming and energy security. Investors, sensing the level of public interest in these stories – and therefore an opportunity in the market – are beginning to invest in industries that reduce human impacts on the ecosystem. Climate change policies will play a key role in the growth of cleantech as it becomes increasingly apparent that products and processes that reduce greenhouse gases will see increased demand.

**Finding 5: Cleantech can create thousands of new jobs.**

Analysis from the University of California at Berkeley<sup>vi</sup> concluded “the renewable energy sector generates more jobs per megawatt of power installed, per unit of energy produced, and per dollar of investment than the fossil-fuel-based energy sector.” E2’s own analysis found that every \$100 million in venture investment generates an average of 2,700 new jobs. We estimate additional U.S. cleantech investment between 2007 and 2010 will be between \$14 billion and \$19 billion, resulting in 400,000 to 500,000 new jobs. If one uses the data from the National Venture Capital Association of 3,500 jobs per \$100 million, the job figure could be as much as 665,000 jobs.

Lots of good news for the industry, and much remains to be done. In spite of the many steps that have been taken in support of the cleantech industry, barriers still remain, keeping it from growing fast enough to head off the climate crisis. The most common barriers are inconsistent policy, long term subsidies for conventional industries, and trade barriers.

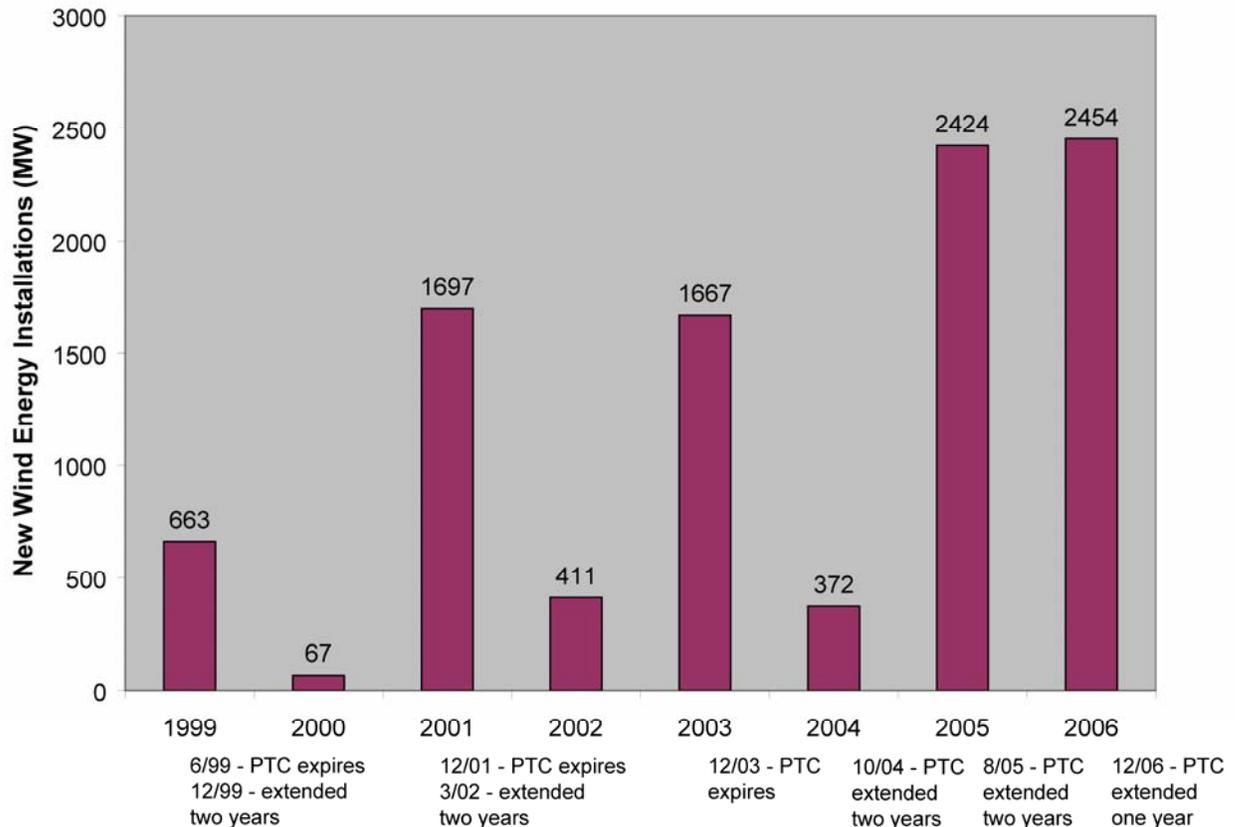
Although government agencies play key regulatory roles in some venture backed industries, they have generally been even handed (in the case of the FDA and Biopharmaceutical approvals) or an agent of change for the future (in the case of the breakup of ATT in the 1970’s, creating competition to the benefit of the economy, consumers and employees. The energy industry is different as the existing infrastructure protects the existing companies and the status quo. For example, customer do not directly chose the source of their electricity. Their electric utility company makes that choice for them.



We did a survey of investors in Cleantech, and among the investors we surveyed, the most often cited complaint about the current regulatory environment surrounding cleantech was the inconsistency and unpredictability of policies affecting the industry. In an open-ended question about industry barriers, 37 percent of our survey respondents volunteered their strong desire for a long-term, predictable approach to policymaking in this arena. As one investor noted, “If the federal policy is unclear or inconsistent, it introduces an element of risk that detracts from the attractiveness of a potential investment. If a federal policy is supportive and appears stable, it makes the investment more attractive.” It appeared to be the group consensus that a less than perfect – but predictable – policy would be preferred over a better policy that comes and goes and can’t be relied on.

Take the wind energy sector as an example. The renewable energy Production Tax Credit (PTC) is equally important to the success of the wind energy industry, which faces both economic and technical hurdles in competing with traditional fossil power sources. But unlike the VEETC and the ethanol import tariff, which have remained in place for many years, the PTC has suffered a yo-yo like fate, lapsing and being renewed approximately every two years – to the consternation of investors and companies, who find themselves unable to plan ahead in such an uncertain environment. As a result of this policy uncertainty, the wind industry has experienced a dramatic boom-bust cycle, as the figure below demonstrates.

### **The Production Tax Credit and its Impact on Wind Energy Installations**



Source: Union of Concerned Scientists and American Wind Energy Association

Another barrier that investors mentioned regularly in the survey (27 percent of the investors surveyed discussed it) is the fact that cleantech products aren't playing on a level playing field with traditional alternatives. These respondents believe that conventional technologies (e.g. fossil fuels) regularly receive large government subsidies that give them a price advantage, even though these technologies have been mainstream for decades. (According to the U.S. Government Accountability Office, the petroleum industry alone received as much as \$150 billion in tax incentives between 1968 and 2000.<sup>vii</sup>) One investor suggested “*corporate welfare for larger companies provides a hidden subsidy to non-cleantech companies. Provide equal subsidies for all technologies, or provide none. Let market forces decide the best application of innovation.*”

While the relatively modest subsidies and incentives that the cleantech industry receives always receive intense scrutiny, the large, long-term subsidies that conventional industries are given are more often taken for granted. Investors were not, however,



arguing for large incentives to prop up the industry. As Bill Reichert, Managing Director of Garage Technology Ventures said, *“The investment has to make sense independent of the public policy or the subsidy or the environmental fad of the month.”*

As the investors in our survey noted, cleantech products are frequently at a competitive disadvantage compared to conventional products. In addition to receiving significant subsidies, conventional products generally waste more natural resources and emit more pollution than cleantech products, thus imposing a cost on society that is not reflected in their price tags. In order to help level the playing field the prices of products need to better reflect their true economic costs to society, thereby sending a signal to consumers about the real effects of their choices.

Congress needs to consider an integrated set of policies which will both address climate change and will stimulate private investment to provide the solutions. I will briefly mention three important policies:

#### 1. Mandatory National Carbon Cap

A mandatory, comprehensive national cap on greenhouse gas emissions, coupled with an emissions trading market, would immediately place a value on the release of carbon dioxide and other greenhouse gases, rewarding those companies that already operate in a clean and efficient manner, and forcing those companies that do not to improve their performances. More importantly, any changes that industry would make to reduce its environmental footprint and come into compliance with the cap would be done efficiently. By establishing an economy-wide cap on greenhouse gases – without specifying specific technologies or strategies – the market would naturally find the most cost-effective responses, whether by purchasing emissions credits, becoming more efficient, or altering the materials or processes used. Thus it should come as no surprise that 59 percent of respondents in our survey (17 of 29) said a national mandatory cap-and-trade system would be critical or important in influencing their investment decisions.

When ten major U.S. corporations<sup>2</sup> joined forces with four environmental advocacy groups in January to form the U.S. Climate Action Partnership (USCAP) and called on Congress to quickly pass legislation to tackle global climate change, it became clear that a significant, growing portion of U.S. businesses believe a carbon cap is necessary for U.S. competitiveness. USCAP, whose corporate members have a combined market capitalization of over \$850 billion and whose non-profit groups have well over one million members worldwide, specifically called for a mandatory cap-and-trade program, along with an accelerated technology research, development and demonstration program,

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<sup>2</sup> This group has since been joined by ConocoPhillips, the third largest U.S. oil company and second largest U.S. oil refiner, with a market capitalization of \$116 billion.



and diplomatic efforts to convince other countries to follow suit.<sup>viii</sup> As of July, USCAP had grown to 29 members organizations.

The unprecedented action of business leaders, including those from the utility industry, proactively and voluntarily seeking government regulation has been repeated several times since the January 2007 press conference. In March 2007, under the leadership of CERES, more than 50 major institutional investors with combined funds under management exceeding \$4 trillion signed a statement asking Congress to impose clear, consistent climate change regulations to help them mitigate climate change risks. Because in addition to making them more competitive globally, a national carbon standard would allow American companies to avoid having to navigate a chaotic maze of state-by-state climate policies. "Without national policies, the competitiveness of American business will be compromised. We don't think we can wait," said Fred Buenrostro, Jr., CEO of CalPERS, the country's largest public pension fund.<sup>ix</sup>

One week prior to the March 2007 CERES announcement, a bipartisan group of Silicon Valley venture capitalists and entrepreneurs testified in Congress about the need for greater federal tax incentives and research funding in cleantech. With a sense of urgency, they also recommended consolidating all federal energy research into a National Institute of Energy that could support public-private partnerships, in the model of the medical sciences' National Institute of Health. "*We are in a crisis, and we have to translate this crisis into opportunity. Missing this moment would be horrible.*" said Aart de Geus, CEO of Synopsys, an electronic design automation company.<sup>x</sup> These business leaders are also part of a bipartisan group of dozens of technology company CEOs known as TechNet, which also advocates establishing a national renewable portfolio standard, a national renewable energy credit marketplace, and a system of long-term, declining incentives for clean technologies.<sup>xi</sup>

## 2. National Renewable Energy Standard

California's experience over the past few decades demonstrates that, far from hurting an economy, well-designed cleantech regulations – such as California's advanced energy efficiency and air quality regulations – can actually stimulate innovation, leading to new economic growth. Knowing that, it becomes clear why 65 percent of the investors we surveyed (19 of 29) said a national renewable energy standard would be a critical or important factor in their investment decisions. In the increasingly carbon-constrained world in which we live, improving the performance of our renewable energy technologies through innovation will be extremely important – not only for our environment but for our economic competitiveness as well. A national renewable energy standard could be a major contributor in driving this innovation in next-generation clean energy technologies.



### 3. More Public R&D Investment

While growth of the clean technologies would benefit from programs that increase demand (for example a cap-and-trade system or renewable portfolio standard), the industry still needs strong investment in basic R&D. Since the energy crises of the 1970s, federal spending on energy research is down significantly, with private investments making up some, but not all, of the difference. Fortunately for the cleantech industry, public and private investments in complementary industries such as biotechnology, semiconductors, and software have been quite strong in recent years, and there is a high degree of technical knowledge spillover from these industries to cleantech sectors. In fact, some of the same people who were involved in startup companies in those other industries in the 1990s are now getting involved in ethanol and photovoltaics companies, among others.<sup>xii</sup>

Still, the success of the cleantech industry should not depend on spillover from its cousin industries, or from private investment alone. Public investment in cleantech research is also crucial, for several reasons:

- In its magnitude alone, it can accelerate the pace of research innovation and development.
- It helps to reassure private investors that this area is important to the public, is worth investing in, and will receive real public support. As one investor in our survey said, public support from individual states “sends a message to entrepreneurs, investors and others that the state intends to create a business environment that is supportive of cleantech.”

Public investment in basic R&D is still necessary to growing new industries of the future. The investors participating in our survey noted that a cleantech product must be able to stand on its own merits, and while they would not invest in a company solely on the basis of government support or subsidies, many noted that government investments are important and would encourage a higher level of private investing. For instance, 59 percent of respondents (17 of 29) said that a government program that matched private investment dollars would be critical or important to their investment decisions. One investor even noted that his fund’s specific investing strategy is to “*leverage publicly funded research at labs and universities, so greater investment on the federal level in that research would be beneficial, as long as it is focused on commercial outcomes.*”

### **The Importance of Implementation**

Aside from the policies themselves, the manner in which they are implemented is crucial to their success. For instance, it’s very important that when a carbon cap (or renewable energy standard or other program) is enacted nationwide, that measure should not preempt states from going even further. If particular states or regions want to enact more



stringent carbon caps, or more aggressive renewable portfolio (or fuel) standards this will only improve the country's environmental health and competitiveness in the cleantech marketplace – it would cost other regions nothing.

The consistency and reliability of the federal policies that are enacted is another important factor. As mentioned earlier, 37 percent of the investors participating in our survey (11 of 30) responded to an open-ended question about the barriers facing the industry by stating the necessity of having predictable, long-term policies in place. This is a strong concern of many stakeholders in the industry. Given that many cleantech companies must compete against subsidized conventional alternatives, having supportive policies stripped away unexpectedly can wreak havoc on them. This is plainly evident in the wind installations and production tax credit. Entrepreneurs and investors both need to have the ability to plan ahead beyond the end of the current fiscal year.

There are questions often asked when these topics are discussed, I will try to anticipate a few of these.

**1. It seems like investment and activity in Cleantech is growing and healthy, so why should the government intervene?**

Because we are in a crisis. A dramatic decrease of carbon released into our climate has to happen quickly. Without intervention, our auto industry has made no progress at all in increasing mileage and decreasing emissions in decades, while Japan and the European community already meet or exceed the 35 mpg standards proposed for the United States to meet by 2018 (the most aggressive proposal)! This has helped neither the environment, nor the American auto industry. While California has passed legislation requiring power it buys to be generated through clean technology, there are those in Congress who would like to see this overturned, as it is more aggressive than what other states might demand. California's Greenhouse Gases Emission Performance Standard Act (SB1368) that became law on January 1, directs the California Energy Commission to set greenhouse gas emissions standards for the baseload electricity used by the state (whether generated in-state or imported from out of state).<sup>xiii</sup> The law effectively prevents the state from signing any long-term procurement contracts for traditional coal-fired power, or any electricity that comes from sources that emit more than a clean, efficient natural gas power plant. (However, the law doesn't explicitly ban any particular form of energy generation – electricity from coal plants with carbon sequestration, for example, would still be able to be sold in the state.)

While almost no electricity from coal is currently generated inside California, the state still imports a fair amount of coal-generated power from outside its borders – and at last count, dozens of new coal power plants were being planned for construction in western



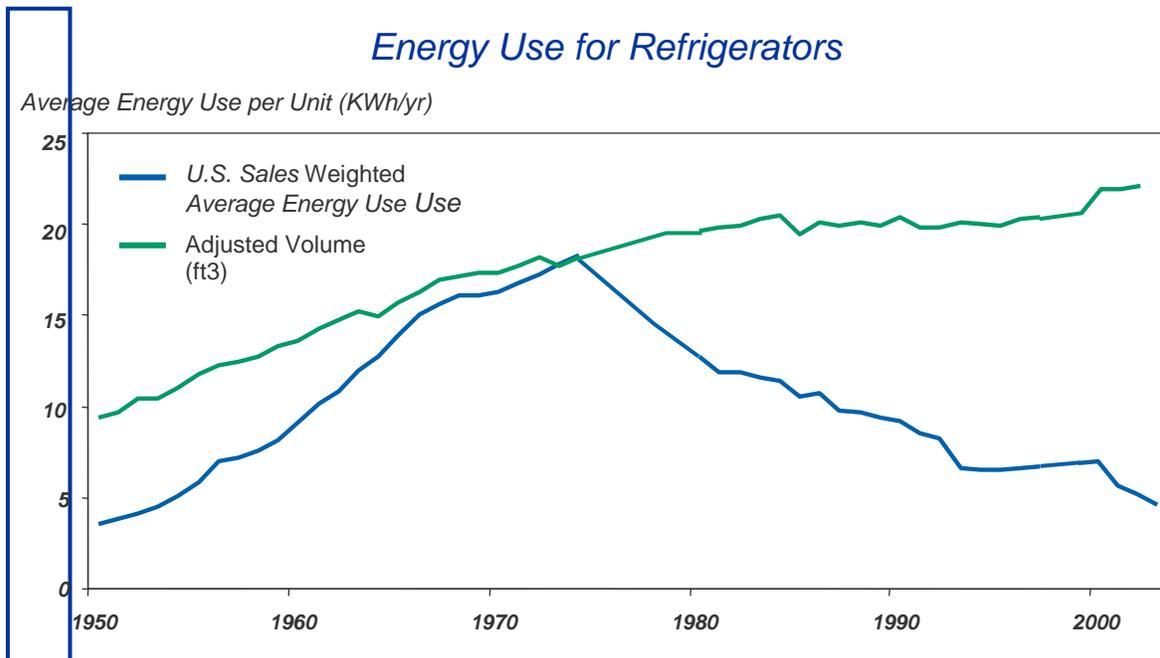
states, many with the aim of selling their power in the growing California electricity market. But SB1368 sends a strong signal to western energy markets, aiming to discourage these large, long-term investments in highly polluting technologies. As a result, cleaner production technologies, like geothermal, wind, or small hydro, will receive a significant competitive advantage in the state.

## **2. Is this just a bubble that will blow away and things will return to normal?**

No, the world has changed. In the last 10 years over 400 million people have emerged from poverty in India and China. They want cars, refrigerators. They want to travel and have air conditioning when it is too hot. They want to live like us, and to do that they need to have as much energy as we use. Meanwhile, the industrialized world continues to use as much energy as ever. Competition for resources has irrevocably changed the game.

## **3. Will this mean that the government picks winners and losers?**

No, it does not. The government did not tell automobile manufacturers how to increase mileage when the first CAFÉ standards were set. Nor did it tell refrigerator manufacturers how to reduce their energy consumption (since those standards were set in the 1970's, energy use in refrigerators has dropped 75%, the equivalent of not building 100 to 300 power plants). But the government did tell them they HAD to meet performance standards, and they did. We recommend a declining carbon cap coupled with federal R&D in a variety of technologies. Let the market have a flatter field for competition.





#### **4. Does this mean that every company wins with a carbon cap strategy?**

Not at all. Change has always been a constant, the components of the Dow Jones Index continually have turned over since it's creation over 100 years ago and our economy thrives by creating industries that add jobs and that add value. Some companies will resist change and those that are better at adapting will replace them. The result will be a net increase in economic output and jobs and a more competitive U.S. This has always been so. Industries that expect or need the government to protect them from change cannot compete in the modern world (if in fact they ever could in any era, today there are no Railroad, Steel or Airline stocks in the Dow).

#### **5. Should the U.S. link its carbon policy to decisions by China and India?**

Only if we want to slow ourselves down. Our contribution to Global Warming is significant and needs to be reduced. California decided that an early start on climate would make the state more competitive vis-à-vis the rest of the U.S. The U.S. will be in a better position to sell cleantech to China and India if we get our country moving first. As we continue to show that our policies create a more robust economy and a cleaner environment, they will rush to join us. They already have a significant appetite to buy cleantech products and services, and they are now buying some of them from countries other than us. The U.S. is no longer the world leader in two important clean energy fields – it ranks third in installed wind power production behind Denmark and Spain,<sup>xiv</sup> and third in photovoltaic power installed behind Germany and Japan. We can regain market leadership with a simple policy of a declining carbon cap coupled with federal R&D in a variety of technologies.

#### **6. What else should we be doing?**

We need to be the people the world has been waiting for, the people our children will say made the decisions that gave their children a safer and healthier place to live. We should not be the people who pass the buck, the people our parents warned us about.



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<sup>i</sup> According to the Cleantech Capital Group, \$7.4B was invested from 1999 through Q2 2005. Q3 2005 was \$.425B. Q4 2005 was \$.502B and 2006 was \$2.9B for a total of \$11.1B.

<sup>ii</sup> Cleantech Venture Network; PricewaterhouseCoopers/National Venture Capital Association MoneyTree™ Report (CVN; MoneyTree). (2007).  
[http://www.pwcmoneytree.com/exhibits/MoneyTree\\_4Q2006\\_Final.pdf](http://www.pwcmoneytree.com/exhibits/MoneyTree_4Q2006_Final.pdf).

<sup>iii</sup> Ibid CVN; MoneyTree

<sup>iv</sup> Cleantech Venture Capital: How Public Policy Has Stimulated Private Investment, May 30, 2007  
<http://www.e2.org/jsp/controller?docId=12959>

<sup>v</sup> “DOE Selects Six Cellulosic Ethanol Plants for up to \$385 Million in Federal Funding”  
<http://www.energy.gov/news/4827.htm>

<sup>vi</sup> Kammen, D., Kapadia, K., & Fripp, M. “Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?” Energy and Resources Group/Goldman School of Public Policy at University of California, Berkeley. (2004). <http://rael.berkeley.edu/files/2004/Kammen-Renewable-Jobs-2004.pdf>.

<sup>vii</sup> “Tax Incentives for Petroleum and Ethanol Fuels.” U.S. Government Accountability Office. (September 25, 2000). <http://www.gao.gov/archive/2000/rc00301r.pdf>.

<sup>viii</sup> “Major Businesses and Environmental Leaders Unite to Call for Swift Action on Global Climate Change.” (Press Release). United States Climate Action Partnership. (January 22, 2007). <http://www.us-cap.org/media/release.pdf>.

<sup>ix</sup> Herbst, M. “Investors Call on Congress to Go Green.” Business Week. (March 20, 2007).  
[http://www.businessweek.com/bwdaily/dnflash/content/mar2007/db20070320\\_535194.htm?chan=top+news\\_top+news+index\\_top+story](http://www.businessweek.com/bwdaily/dnflash/content/mar2007/db20070320_535194.htm?chan=top+news_top+news+index_top+story).

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