Testimony of Will Coleman
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Hearing to examine current global investment trends in clean energy technologies and the impact of domestic policies on that investment

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Introduction

Thank you Mr. Chairman, Senator Murkowski and distinguished members of the Committee. I appreciate the opportunity to be here today. It is an honor and a privilege to speak with you on an issue that is so critical to our nation.

I am Will Coleman, a partner at the venture capital firm Mohr Davidow. We invest in early stage companies on behalf of some of the largest endowments, foundations, and families in America. Since 1983, we have funded over 250 companies, helping entrepreneurs transform new ideas into thriving businesses and create new jobs in information technology, life sciences, and energy.

We were one of the first mainline funds to move into energy and have since invested in a range of sectors including solar, biochemicals, coal gasification, transportation, and battery materials, among others. So we have had the opportunity to experience the challenges of building successful businesses in these segments.

I'm here today to talk about some of those challenges, but I also want to start with a premise. Clean energy may well be the largest opportunity of the coming century. But more importantly, taking a lead on the next generation of energy technologies is absolutely critical to our continued competitiveness as a nation.

Unfortunately, on both fronts we are falling behind.

American Competitiveness Requires Next-Generation Energy Solutions

As venture investors, we sit at the front edge of innovation in this country. Globally we are seeing investment in clean technology continue to grow. In 2010, $7.8 billion was invested by venture capitalists into clean tech companies and over $127 billion was invested globally in renewable energy project financing. The International Energy Agency (IEA) forecasts that over $5.7 trillion will be invested in renewable energy globally over the next two decades. Unfortunately it is looking less and less likely that investment will be here in the U.S. We are not only seeing companies start here in the U.S. and then move overseas, but we are increasingly seeing companies start overseas and stay overseas.

As Americans, we pride ourselves on our ingenuity and our pioneering nature. Our greatest strength is our ability to take on great challenges, and to lead the world in transformations that have impacted every facet of our lives. In the past, we've embraced change and we have prospered as a result. As Americans we take risks.

However, in energy we seem to fear change, and it is paralyzing us. I am concerned that if we don't work to develop the next generation of solutions here in the U.S. we will lose the capability and know how to innovate in these sectors in the future.

Why is this a problem? The single biggest challenge we now face as a nation is our dependence on unsecure, unsustainable, and unaffordable conventional energy supplies.

In 2010 we paid $337 billion to foreign countries for oil imports; stated differently, we transferred $337 billion of America's wealth – that could have been reinvested in businesses and jobs in the U.S. -- to oil-exporting countries. That represents over 42 percent of our trade deficit -- 42 percent! The number will be even higher in 2011. In the time it takes to have this hearing we will have paid $36 million for foreign oil -- and that's only direct spending. So while we talk about reviving our economy and cutting deficits, the single largest cost to our economy is our dependence on oil.

And I say "oil," not just "foreign oil," for a reason. The issue is not oil itself. It's that it is a global commodity. Although domestic exploration may provide important security and economic benefits in the short term, we don't have the domestic capacity to offset the long-term trend of rising global demand. In essence, we lack a portfolio approach or a hedging strategy, which could cushion us from the most severe commodity price swings.

That means, American families and businesses will remain at the mercy of global energy prices. The oil price shocks of 1973-74, the late 1970s and early 1980s, the early 1990's, and 2008 were all followed by recessions (EIA). As long as we don't have alternatives we cannot avoid the price swings.

Our dependence on oil is not just an energy problem. It is an economic problem. Our biggest competitors recognize the opportunity and are seizing leadership positions with the clear goal of out-competing an increasingly dependent and out-dated America.

China, India, and Brazil are increasingly focused on developing and deploying the next generation of energy technologies. China is now the number one global producer of photovoltaic solar cells. They were barely on the map a few years ago in solar production. Just last week, Suntech, a Chinese solar manufacturing company overtook America's leading solar manufacturer, First Solar, as the world's largest producer of solar modules. This emergence of Chinese manufacturing certainly has something to do with the $22.5 billion in low cost loans that the Chinese government provided to five domestic solar producers in Q2-Q3 2010. However, they are also heavily focused on nuclear and now coal gasification and have recently

stepped up their engagement with American startups to deploy leading edge technologies in China instead of the United States. China is the world leader in installed hydro power capacity and overtook the United States in 2010 for the number one ranking in installed wind power capacity, too.

Over the past few years, China has committed to clean energy deployment targets that dwarf the U.S. commitment and last year announced plans to spend as much as $738 billion through 2020 to reach those targets.

Some people would argue that we cannot afford to outspend the Chinese in this effort, and we all know you don't want to bring a knife to a gunfight. I would not argue that our government should try to outspend theirs, but I can't accept the premise that we should concede anything. Our economy is still more than two times larger than China's with one quarter the population. I absolutely believe that the U.S. private sector can out-innovate and out-invest the Chinese government.

We won the Cold War in large part by outspending the Soviets. We can't let our competitors do the same thing to us in the energy race. Instead of letting capital flee to China, India and Brazil, we need to create the investing climate that draws our own private capital stocks into the market and draws foreign capital flows here into the U.S. We can create such a climate without massive government spending, but we do need government action and support.

Challenges of Investing in U.S. Energy Markets

Few people in this room today would challenge the notion that America's commitment to free market principles has played a key – if not decisive – role in building our global economic leadership. The venture industry is predicated on belief in the power of the private market to generate and adopt better technologies.

I am not here today asking for help. We as venture capital investors have plenty of opportunity to invest in energy and clean technology models that fit our return needs. That said, we see a number of obstacles in certain segments. As a result of these obstacles, there are specific industries and segments where private investors can't or won't go today, and there are others where investors will only go selectively. These are often the most strategically important industries for our nation's future. We must resolve these obstacles to remain competitive.

Obstacles to Technology Adoption

First, the U.S. does ***not*** have an innovation problem, but rather, we have an "innovation adoption" problem. Most energy markets are either a) heavily regulated or b) dominated by incumbents. In either case, markets are extremely hard to enter for a new player.

And in the case of electricity markets we actually have both. The patchwork of state and federal regulations is incredibly challenging to navigate for any company – let alone a fledgling

startup. The only path to market is often through utilities and public utility commissions, both of which have incredibly low tolerances for risk. Market entry for any new technology, particularly on the grid side, can take 5 to 10 years of piloting and small deployments before a single state is ready to deploy that technology broadly. This timeframe eliminates a whole category of technologies for venture investors who need to see rapid growth much more quickly to make the investing model work.

In the fuels and chemicals industries, transportation, and other industrial segments, the primary challenge for new entrants is that the incumbents are often vertically integrated, own the channels, and have a history of sharing IP. In many cases, profits depend more on collaboration than competition. To enter the market, a new technology must go through these incumbents or re-invent the entire supply chain. Unless incumbents believe that that these new entrants can build large stand-alone companies – in other words, pose a credible threat to their businesses - then the incumbents have little incentive to adopt new technologies.

Without these incentives, incumbents are unlikely to pay premiums for new technology and we won't see the value creation necessary to propel new public offerings or acquisitions. In the absence of valuable exits, equity investors will not invest upstream in the technology development necessary to prove out the technology. We see a reverse domino effect and the innovation pipeline in those segments dries up – which means that a whole set of improvements may never make it to market.

Financing Gaps

The second obstacle is that even in markets which are free and open there are often financing gaps that can prevent new technologies from getting to market. Incumbent companies benefit from decades of investment in infrastructure, legacy government support, fully depreciated plants, economies of scale and operating track records that afford access to low-cost capital.

My firm recently sold one of the companies in our portfolio to Sharp – partly because the cost of the working capital required to grow the company would have been much higher had we secured it through private sources rather than through Sharp's balance sheet. The only path to rapid growth was through a major corporate partner.

For startups, getting to cost competitiveness typically requires getting to scale. As with any new product, particularly an industrial or commodity product, part of the cost reduction comes from technological innovation and part of it comes from economies of scale. But this can be a Catch-22. Many people argue that the new alternative energy technologies are not competitive so we shouldn't support them, and if they were competitive then we wouldn't need to. But that misses the point. The question isn't where they are on the cost curve today; the question is whether their costs will ultimately get below existing options. That is what makes them worth investing in.

All one has to do is look at the solar cost curves to see how this works. Over the past thirty years, solar manufacturers have made significant improvements in cost with every generation of new technology -- but the real cost reductions have been primarily when they scaled production. For example, First Solar's panel production costs have dropped from over $3.00/watt in 2004 to under $0.80/watt today, due in large part to a 2,500% increase in production capacity from 2004-2008. And costs continue to drop. That is part of the reason why First Solar is now more valuable as a company than every U.S. coal company except one. Fortunately, we have a company we hope will get even lower.

The challenge for most startups is that without operating track records, they are unable to leverage low-cost capital to get there. This means that they typically need to raise higher-cost equity or some combination of equity, mezzanine financing (if available), and debt (which often isn't available) to build early commercial plants.

Again, this triggers the reverse domino effect. If we as early stage investors don't anticipate low cost capital being available to scale these technologies, then there is no way we will invest in the early technology development in the first place.

Policies Don't Support Startups

The third obstacle is that where we do have incentives and tax credits to support new technologies, many of them are not designed for small emerging companies. Startups do not have the balance sheets or track records that larger corporations do and have trouble securing and monetizing the credits, incentives, and loans that have been made available. As a result, it forces startups to either construct some mix of unnatural third-party relationships or go to market through the big incumbents, which can have dramatic impact on their value and investor interest.

If time didn't matter, if we were not in a race to remain competitive in the global economy, if the private market valued our national security, the domesticity of our products, and the health and environmental impacts, then ideally we would let the market work to adopt the best solutions. Unfortunately, time does matter and the market does not value these national strategic interests. For these reasons, whether we like it or not, our government must play a proactive role in encouraging clean energy development.

Accelerating the Adoption of Clean Energy

The good news for America is that our scientists and entrepreneurs are still churning out innovative clean technology ideas and companies. We have a robust national lab system, which I have had the opportunity to work with as an advisor to the National Renewable Energy Lab. And we have some of the best university research labs in the world. We also have a robust private capital ecosystem that has growing experience in energy and clean technology. In 2010, the venture capital industry invested more than $3.6 billion dollars into clean technology companies, which is second only to information technology. If the history of venture capital is

any guide, then those dollars can generate ten times the investment downstream. The challenge is how to draw the necessary investors into the segments that represent heavier capital lifts and riskier market entry.

Fortunately, there are several ways in which the U.S can unleash a wave of private sector investment and promote innovation at the same time. Government can do this without "picking winners" and without huge costs to the taxpayer.

1) Improve market access and demand

It all starts with demand. Where there are large, open markets that can be captured by better performing technologies, you will see investors, and you will see the development of a manufacturing base. Germany accomplished this with a robust Feed-In-Tariff, which attracted most of the top solar companies to build manufacturing facilities inside the country. First Solar began as an American company but moved to Germany to be close to the market.

Similarly, the Chinese have aggressive five-year plans that make it clear which segments will reward investment. These policies are easy to invest ahead of.

Here in the U.S., we have a patchwork of state renewable portfolio standards and programs. While these programs have supported the development of renewable energy in those states, we lack the kind of nationally unified strategy that would create more attractive opportunities and provide long-term signals to investors. We need to implement a set of national standards for electricity and transportation. Programs like a Clean Energy Standard and an Open Vehicle Standard are the simplest market based approaches. They would push incumbents to adopt new technologies more rapidly and give investors the incentives to take larger capital risks.

2) Fill the financing gaps

For those segments that have high strategic value to our nation, but do not attract private investment, we need a set of tools to help fill the financing gaps and draw private capital in. These tools should prioritize innovative technologies, and they need to be flexible, efficient, and technology neutral. Above all else, they must be predictable. Investors need to know that if a company builds a technology that achieves a specified level of performance, they will be able to access these tools to help finance them to scale.

The primary financing gap typically occurs where a company must scale up to a demonstration facility or first commercial plant. We've seen this in solar manufacturing facilities, biofuel plants, battery production lines and a host of other technologies. The capital requirements tend to outstrip the capacity of most equity investors that are willing to tolerate technology risk. Without an operating track record, debt is difficult to secure. We have already seen a mix of government solutions, ranging from grants to loans that target this gap. These are helpful but not complete. The solution need not be only direct spending or billion-dollar government-funded demonstration projects. There are existing classes of capital that could be drawn in to

fill these funding gaps – venture debt, mezzanine funds and other lenders – but they need some inducements to come into these sectors. The legislation co-sponsored by the Chairman and Ranking Member Murkowski in the last Congress to create the Clean Energy Deployment Administration is targeted to solve this problem.

The bottom line is that if we are serious about filling these gaps in sectors that have high strategic value to our nation, then government needs the capacity and flexibility to provide a mix of different structures and adapt these structures over time to evolve with the market.

3) Replenish the innovation pipeline

Thirdly, we need to make sure we continue to replenish the innovation pipeline. We cannot starve the research budgets that not only breed the next generation of innovation, but keep the talent here in the U.S. I recently met with a professor who had started a battery company in California. He had immigrated to the United States from Vietnam to go to school here and stayed to become a professor. We had seeded his research and other U.S. venture investors had backed the startup. He had just returned from a trip to China and he was worried about our ability as a country to keep pace with the Chinese. I could see in his eyes that he desperately and earnestly wanted to build his company here. This is where he and his team wanted to be, but he didn't think he could pass up not only the financial support that the Chinese were throwing at him, but also the lab and research resources they would provide.

We have the talent, but we need a commercialization pathway that can continue to keep that talent here. That's why it is critical that Congress continue to support basic R&D at universities and labs, and fund the Advanced Research Projects Agency for Energy. ARPA-E was designed to spur exactly the type of early commercial research and development that our innovators and venture investors look for. ARPA-E is a small but critical program that has developed into a model program for how government should tackle these challenges.

4) Accelerate the adoption and deployment process

Finally, the U.S. must streamline the process by which energy and other clean technology companies obtain patents, permits, certification and authorization to manufacture and sell their products. In short, the pathway through the regulatory environment must be clear and predictable, and it must be manageable by large and small companies alike. Right now it is not. We need to show companies that America is open for business.

One of the biggest solar projects in the country nearly died three different times in California because regulators changed the permitting process midstream and regulators couldn't appreciate the impact of another six-month delay. If the project had died, the company would have died and likely the technology with it. We cannot allow promising technologies to die on the vine just because of regulatory friction.

Conclusion

The challenge we face as a nation is complex. The solutions need not be. We have to be careful not to let the perfect be the enemy of the good as we take steps toward reinvesting in our infrastructure and renewing our competitive position in the world. We must also recognize the extraordinary urgency of this challenge. The pressure is building on entrepreneurial American energy companies to move to China or Europe to be close to growing markets, to secure financing for that first commercial facility, or to snag additional research & development funds. So the challenge is not just about supporting the most promising growth sector of the next several decades. It is about ensuring that America builds the next generation of energy technologies that will be the bedrock of our economic competitiveness over the coming century.

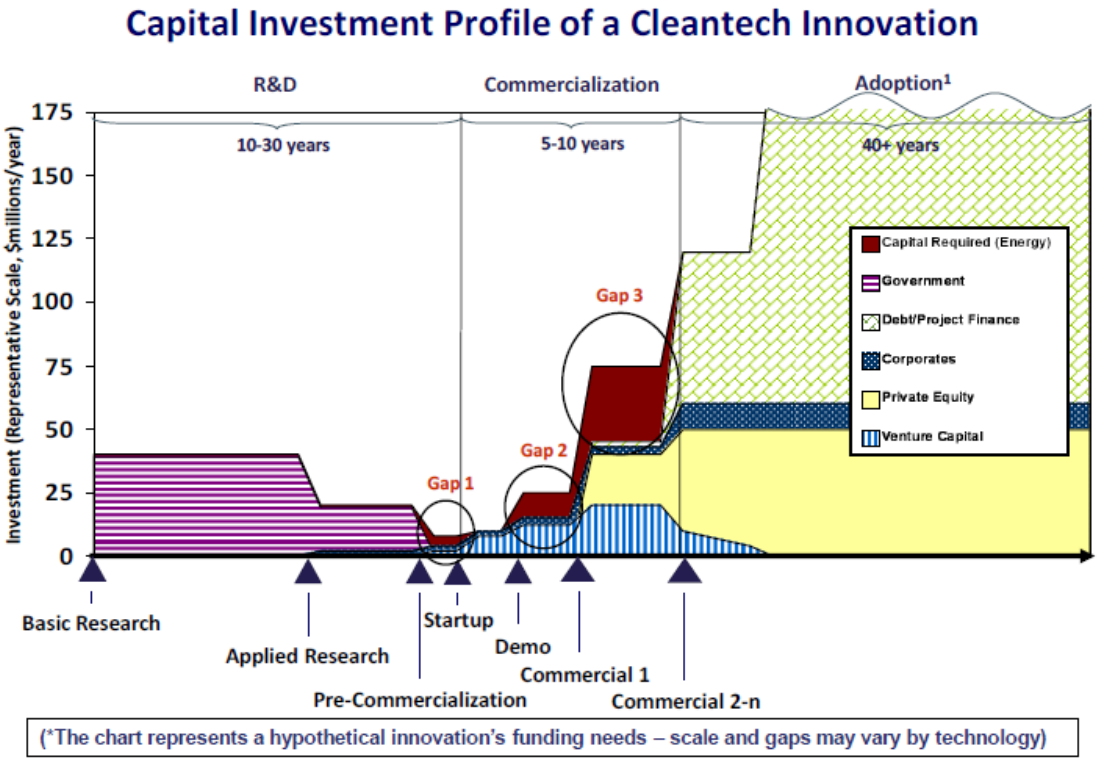
If we act now, we can do this. If we let national interests supersede parochial interests, we can do this. We can harness the ingenuity and drive that we see every day in our entrepreneurs, and leverage the strength of our private markets to maintain our leadership and secure our economic prosperity for decades to come.

That, I am confident in.

Thank you for your time here today. I look forward to your questions.

APPENDIX:

Chart 1.



Source: Mohr Davidow Ventures.

[1] The capital investment associated with adoption is depicted to indicate that it may well exceed $175 million/ year.