



Cleantech 2009: The Emergence of a Low Carbon Economy

How California policy can accelerate economic growth and job generation through the cleantech sector

Overview

The year 2008 was a banner year for cleantech that for the first time led all other sectors in venture capital with \$3.3 billion invested in California companies and \$5.9 billion invested in North America. The sector's first boom, beginning in 2004, was supported by state and national policies that focused on improving efficiency, increasing the availability of clean energy and reducing global warming pollution. The boom ended with the sector's sharp declines in Q4 2008 and Q1 2009, in tandem with the global economic recession.

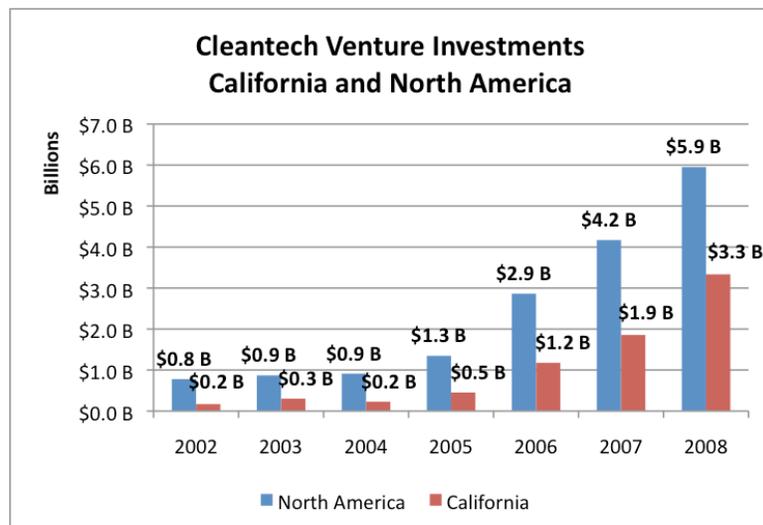
Despite this downturn, cleantech may recover quickly, as attention shifts to economic stimulus monies. Over \$200B in government funding worldwide is likely to be spent on cleantech in 2009, an amount that is larger than the total private capital expenditures of \$150B in 2008.

The long-term drivers for Cleantech are still intact. These include (1) the growing demand for energy services as per-capita incomes increase, (2) the stress on water supplies, (3) the urgent need to reduce greenhouse gas (GHG) emissions to mitigate the worst effects of climate change, and (4) the long-term supply issues of traditional fossil fuels.

Upcoming California policy decisions on climate, energy and water will play a significant role in determining not only the short-term recovery but the long-term growth of a new low carbon economy in California, ushered in by expansion and job generation in the cleantech sector.

2008 in Review

In 2008, the Cleantech sector had its strongest year since the boom began in 2004. Total venture investments in North American cleantech reached \$5.9B in 2008 – up 42% from 2007, making cleantech the largest venture investment category in 2008 in the U.S. (software was second with \$4.9B).¹ California's share of cleantech investment reached 56% or \$3.3B. This is a significant change from a 34% share in 2005.



¹ "Cleantech Investment- 2008 Annual Review" from the Cleantech Group - www.cleantech.com

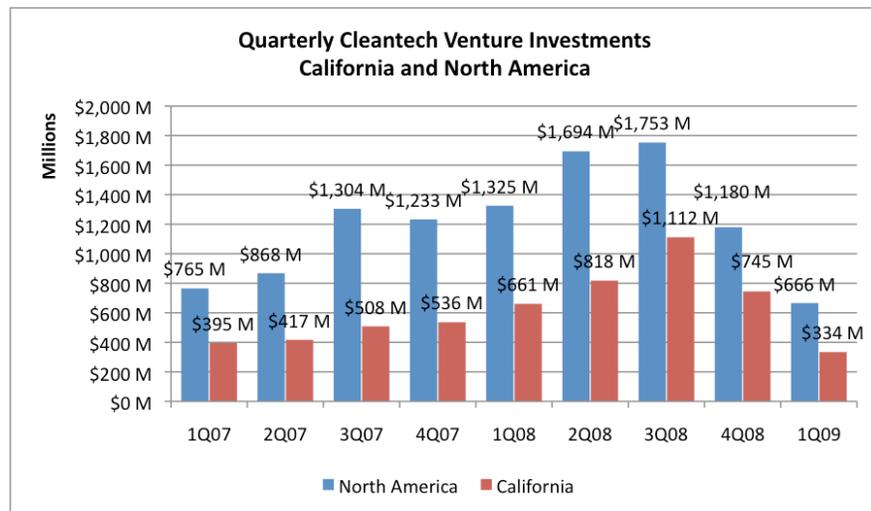
Our estimate shows that 2,700 direct jobs are created for every \$100M in venture investment (see our 2006 Cleantech report²). We project that venture investments between 2007 and 2010 in this sector will be between \$14-19B, resulting in 400,000 to 500,000 new direct jobs in the United States.

During this first boom, there were several significant policies that influenced cleantech including (but not limited to):

1. California Renewable Portfolio Standards
2. \$500M private equity investment in cleantech by CalPERS & CalSTRS (2004)
3. Replacement of MTBE with ethanol as gas additive (2005)
4. AB 32 (2006)
5. Federal Renewable Fuel Standard (2007)
6. Re-instatement of federal tax policies for renewable energy after a decade of inconsistent, short term policies (2008)

The downturn in the last two quarters

Cleantech is not immune to the global recession or the downturn in the availability of credit and project financing. In the 4th quarter of 2008, cleantech venture investments in North America fell 33% from the previous quarter while overall venture investments in North America fell 26%.



The decline continued into the first quarter of 2009 marking the first time that cleantech investing has declined in two consecutive quarters since the boom started in 2004. Investment in California companies was \$334M in Q1 2009 as compared to \$661M in Q1 2008.

Venture capital declines have been due to (1) a general concern about investment risk, (2) the lack of capital from traditional investors such as university endowments and public pension funds, (3) the collapse of the market for new public offerings (4) the collapse in valuations from mergers and acquisitions, (5) more cash required by existing portfolio companies due to a shortfall in their revenues and (6) the decline in energy prices from cyclical highs in the first half of 2008.

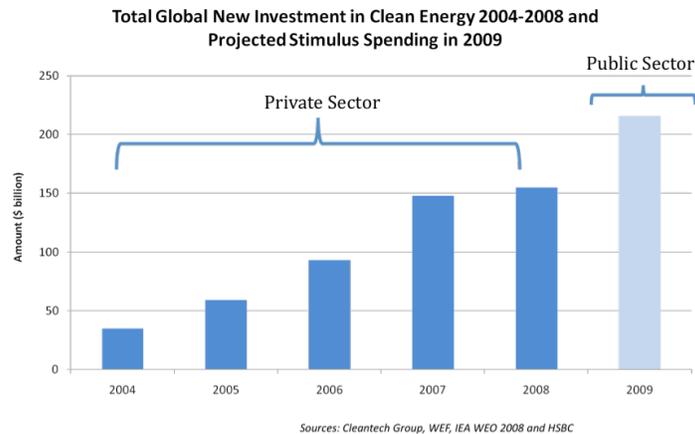
Cleantech is defined as products and services that (1) provide superior performance at competitive costs, (2) greatly reduce or eliminate negative environmental impacts and (3) improve the productive and sustainable use of natural resources. Cleantech is divided into 8 categories: energy, transportation, water, air & environment, materials, manufacturing/industrial, agriculture and recycling/waste.

² "Creating Cleantech Clusters" - <http://www.e2.org/jsp/controller?docId=10462>

The public sector will play a larger role in 2009

The public sector will play a larger role in 2009 and beyond, due to cleantech's potential to provide significant economic and green job benefits, and the need for cleantech products and services to meet demands created by energy, water and climate policies.

Total global investment (including venture, project financing and other investments) from the private sector in 2008 exceeded \$150B. While this is likely to decline, globally there is more than \$200B in public sector funds directed towards cleantech in 2009.



In the U.S., incentives already authorized include over \$60B in direct spending & subsidies, \$7.6B in bonds and loan programs and a variety of tax credits. These programs have started to produce results. For example, wind farm projects are on the rise due to the revised tax policies. However, most companies report general confusion about how to apply for stimulus funds.

The risk is that established companies with well-developed connections to Washington will have an easier time accessing the stimulus programs while those without existing connections or the resources to build them will be left behind. In general, tax incentives avoid this problem since they are more straightforward to use.

Policy opportunities

As our May 2007 report, "[Cleantech Venture Capital: How Public Policy Has Stimulated Private Investment](#)"³, states, the drivers for cleantech investments are a combination of market economics and public policies. A robust market is key as investors are rarely interested in products that are produced primarily to meet a policy requirement. Today there are cleantech companies with significant advancements in solar, wind, energy efficiency, advanced batteries for automotive and other consumer applications, advanced biofuels, water efficiency and recycling, green building materials, and other technologies that can improve our economic and environmental performance - if we get the policies right.

As general principles we believe:

1. Policies have to be long-term and consistent.
2. Policies should set performance standards, not attempt to "pick winners" among technologies.
3. Governments have a difficult time allocating capital among private companies and should avoid policy designs that require this.
4. The market needs clear price signals. The absence of a price signal on carbon and presence of subsidies on fossil fuels delivers the wrong message.
5. Emphasis should be on increasing market demand through cost-effective performance standards and financial programs.

³ "How Public Policy Has Stimulated Private Investment" - <http://www.e2.org/jsp/controller?docId=12959>

California policies and our state's history of attracting and keeping entrepreneurial talent has resulted in a significant base of cleantech companies in the state. Key opportunities to advance those policies include:

1. Implementation of The Global Warming Solutions Act of 2006 (AB 32)

- a. The implementation of AB 32 will contain a collection of performance standards and market mechanisms that stimulate cleantech, green jobs, and will provide true competition in the energy market. California needs to maintain the current implementation schedule.

2. Complementary energy and water policies

- a. Expansion of renewable electricity through an expanded RPS combined with policies that make it easier to scale up renewable energy generation.
- b. Implementation of the Low Carbon Fuel Standard (LCFS) recently adopted by the Air Resources Board. Grants and loans from California AB 118 (Nunez) that fund alternative fuel companies and projects are expected to be \$275 M combined in 2008 and 2009.
- c. Water efficiency policies.

Conclusion

The first boom in cleantech created a strong industry sector that was the No. 1 venture investment category in 2008. The long-term drivers for cleantech are still intact and include (1) the growing demand for energy services as per-capita incomes increase, (2) the stress on water supplies, (3) the urgent need to reduce GHG emissions to mitigate the worst effects of climate change, and (4) the long-term supply issues of traditional fossil fuels.

California's leadership in entrepreneurship combined with strong public policy has made the state a strong player in cleantech. Maintaining this leadership will require continued attention to policy, as well as scaling up the market demand for cleantech products and services that are consistent with the goal of AB 32.

ABOUT E2 (www.e2.org)

Environmental Entrepreneurs (E2) is the *independent* business voice for the environment. E2 is a national community of individual business leaders who advocate for good environmental policy while building economic prosperity. E2 takes a reasoned, economically sound approach to environmental issues by relying on fact-based policy expertise. As the independent business voice in the debate, E2 is effective and delivers results at both the state and national levels through its bipartisan efforts.

ABOUT CLEANTECH GROUP LLC (www.cleantech.com)

The Cleantech Group, LLC is a membership-based network that connects venture, corporate and institutional investors, entrepreneurs and service providers active in clean technology through related information products, online services and the Cleantech Forum platform of events. The organization's mission is to accelerate the market adoption of venture innovation and cleantech investment. Cleantech Group serves more than 1500 affiliate investor member firms worldwide.