

Cleantech 2009: The Emergence of a Low Carbon Economy

How 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 investment, with \$5.9 billion committed in North America. The sector's first boom, beginning in 2004, was supported by national and state 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.

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.

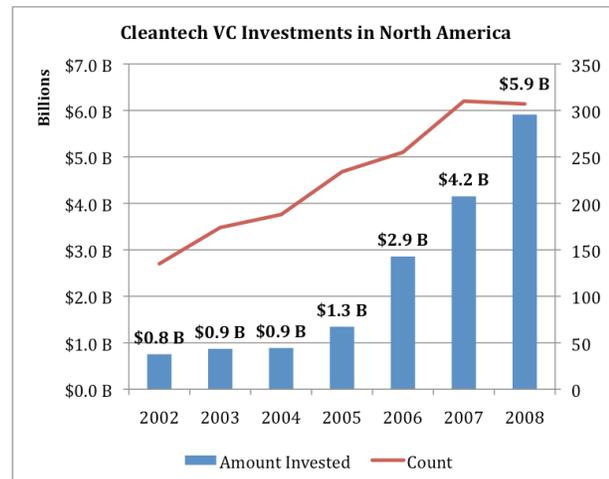
The long-term drivers for Cleantech are still intact. These include (1) the growing demand for energy services as per-capita incomes increase, (2) the stress on water supplies, (3) the urgent need to reduce greenhouse gas (GHG) emissions to mitigate the worst effects of climate change, and (4) the long-term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

Upcoming policy decisions on climate, energy and transportation will play a significant role in determining not only the short-term recovery but the long-term growth of a new low carbon economy, 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 Cleantech reached \$5.9B in 2008 – up 42% from 2007, making Cleantech the largest venture investment category in 2008 in North America (software was second with \$4.9B).¹

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



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

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

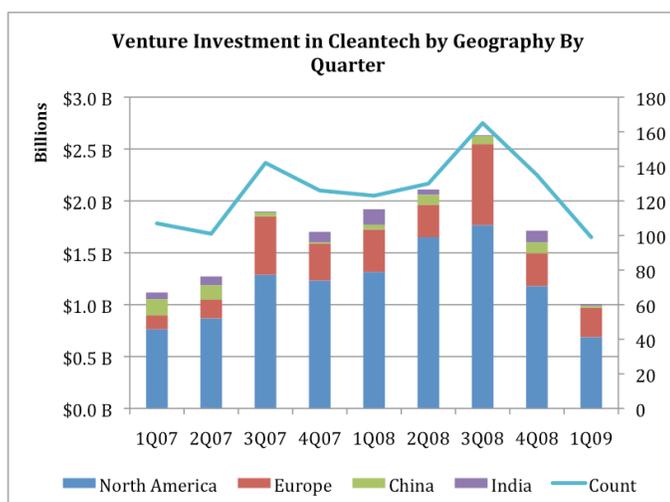
² "Creating Cleantech Clusters" - <http://www.e2.org/jsp/controller?docId=10462>

1. State Renewable Portfolio Standards
2. \$500M private equity investment in Cleantech by two public pension funds (2004)
3. Replacement of MTBE with ethanol as gas additive (2005)
4. State climate policies (2006 - 2008)
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 global 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. This is illustrated in the chart at right, showing worldwide venture investments by quarter with North America receiving about two-thirds of all venture investments, followed by Europe, China and India.



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.

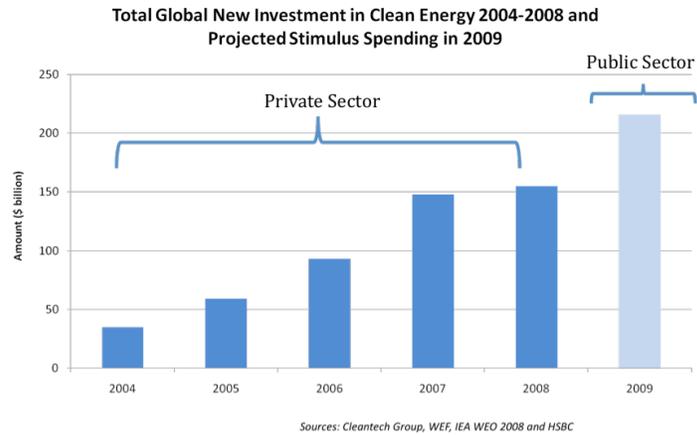
Cleantech is defined as products and services that (1) provide superior performance at competitive costs, (2) greatly reduce or eliminate negative environmental impacts and (3) improve the productive and sustainable use of natural resources. Cleantech is divided into 8 categories: energy, transportation,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

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.

Global Leadership

It is not enough that Cleantech companies start in the U.S. - it is important to keep them here by enabling a large domestic market and by maintaining consistent and supportive policies over a long period of time. If we measure progress by the size of the 10 largest public companies in a single Cleantech sector, the results show that most are domiciled outside the U.S. For example, only two of the 10 largest photovoltaic suppliers (First Solar and SunPower) and two of the 10 largest wind power suppliers (GE and Clipper) are domiciled in the U.S.

Country	Percentage
South Korea	69%
China	38%
France	20%
U.S.	16%
Germany	13%

As countries implement their stimulus policies, the percentages of their stimulus money directed towards Cleantech vary widely - as the chart at right demonstrates (source: HSBC). As new technologies come to market, the U.S. has the opportunity to achieve and retain leadership but it will depend on getting the policies right.

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 principle we believe:

1. Policies have to be long-term and consistent.

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

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.

The 111th Congress and the Obama Administration have the opportunity to make significant advances:

1. **An economy-wide declining cap on greenhouse gas emissions to achieve 80% reductions below 1990 levels by 2050**
 - a. The “American Clean Energy and Security Act” defines a comprehensive approach to reducing greenhouse gas emissions. Entities within capped sectors should be allowed to buy and sell allowances and pursue cost-effective strategies to reduce emissions.
2. **Complementary energy policies**
 - a. Economic stimulus for energy efficiency, including building and appliance efficiency standards, and “decoupling policies”⁴ providing utilities with the same incentives to reduce energy demand as to increase energy generation.
 - b. Energy Efficiency Resource Standard – a standard for how much of total energy “supplied” by utilities should be found in efficiency.
 - c. The Low Carbon Fuel Standard, under consideration in both houses and under evaluation by EPA and scheduled for adoption in California, establishes a performance standard for lifecycle GHG emissions from transportation fuels. This technology-neutral performance standard creates a market for fuels – including liquid, gas and electricity – with reduced GHG emission profiles.
 - d. National Renewable Electricity Standard
3. **Transportation policies** that invest in low carbon vehicle technologies and fuels, and reduce vehicle miles traveled by creating incentives for regional growth planning to increase density and incorporate mass transit

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.

Public policies currently under consideration in the Obama Administration and in Congress – including a declining cap on greenhouse gas emissions, and complementary energy and transportation policies – will serve the dual roles of addressing critical national energy and resource policy interests while creating new jobs through the growth of a low carbon economy.

⁴ DOE is requiring states to commit to “decoupling policies” in order to participate in the economic stimulus energy efficiency program. According to Alliance to Save Energy, as of March 13th, 19 states have committed to decoupling policies.