

It's time to save the golden goose

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— Matthew Lewis, spokesman for the San Francisco office of ClimateWorks Foundation



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Silicon Valley faces fierce global competition in cleantech

By John Boudreau

CHANGZHOU, China — In other tech revolutions of recent decades, Silicon Valley became the uncontested global leader. The region's ability to innovate its way to the top in cleantech, though, is far from guaranteed. Competition is fierce and global, with trillions of dollars at stake.

One of the valley's greatest challenges comes from here. China's drive to be a dominant power in the emerging global cleantech industry was on display one recent morning on the campus of the nation's third-largest solar-panel maker, Trina Solar. New assembly-line employees, in an exercise designed to instill discipline, marched military-style around the grid-like campus, chanting responses to a drill leader dressed in army fatigues.

But China's ambitions in cleantech reach far beyond piecing together solar panels. The central government has committed more than \$100 billion a year to green technology research. It also has put in place incentives to create markets for everything from electric cars to rooftop solar water heaters to jump-start homegrown cleantech companies.

Provincial and local governments also are investing heavily in cleantech. Leaders in Jiangsu Province, where Trina Solar is located, are placing big bets on the solar industry, inspired by the municipal government of Wuxi. That Jiangsu Province city financially backed Suntech Power, now a global solar leader.

"China is moving very aggressively," U.S. Energy Secretary Steven Chu said during a visit to Google's Mountain View headquarters last fall. "They want to be a leader in this new industrial revolution."

A group of valley tech executives, including former Intel CEO Andy

Grove, recently sent a letter to Chu urging the energy secretary to "sound the alarm bell to make America aware — clearly and unequivocally — of how rapidly other nations, particularly China, are moving on clean energy.

"Unless we move quickly and commit substantial resources on a sustained basis, we risk becoming an energy also-ran, and risk developing a new dependency," said the letter, also signed by Michael Splinter, CEO of Applied Materials, and John Doerr, a partner at venture capital firm Kleiner, Perkins, Caufield & Byers.

They urge the government to provide financial assistance to clean energy industries, including incentives for replacing polluting power plants with renewable sources of energy.

U.S. is lagging

Currently, only five of the world's top 30 companies in the solar, wind and next-generation battery markets are based in the United States, according to John Denniston, also a partner with Kleiner.

U.S. government incentives — such as tax breaks and a regulation requiring utilities to buy power from solar and wind energy companies — were slowly eliminated in the 1980s after helping California become a global cleantech leader, said Ryan Wisner, a scientist at Lawrence Berkeley National Laboratory. Around the same time, Denmark, Germany and Spain — whose governments adopted policies and incentives to jump-start cleantech enterprises — were emerging as global leaders.

"China is doing it. Europe is doing it. If we don't take the lead, instead of importing oil, we will be importing advanced technologies," Denniston said.

The rewards are eye-popping — an estimated \$7 trillion annual market for energy and transportation alone.

"When it comes to cleantech, we have the largest market opportunity in the history of the planet driven by global climate change, resource constraints and energy independence," said Dallas Kachan, managing director of Cleantech Group. "Silicon Valley is critical to this revolution, but it does not occupy the throne it once did."

China's leaders see new energy technology as their country's only hope to curtail the sky-blotting pollution that threatens economic progress as well as the health of its 1.3 billion citizens. They also view cleantech as a gold rush that will propel Chinese companies to world-dominating status.

In addition to investing in cleantech innovation, China's central government has put in place market-driving policies for renewable energy: By 2020, at least 15 percent of the nation's energy must come from sources such as wind and solar, more than double the current 7 percent. The United States has no comparable requirement, though California and about 30 other states have set voluntary goals.

At the local level, Chinese municipalities are building solar parks and offering cheap land and tax incentives to encourage cleantech companies to expand. State-owned banks offer financing to renewable energy companies at much lower interest rates than competitors can get in Europe or the United States.

The policies are paying off: China is now the world's largest producer and exporter of solar cells. The cost of solar panels internationally has dropped by half — from \$4 a watt to \$2 a watt — in the past year and half, partly due to low labor costs and improved efficiencies in production in China.

China is also the largest hydro-power generator in the world. And it is expected to soon pass the United

States in new wind-power generation.

In October, a Chinese-U.S. consortium announced it will construct a \$1.5 billion wind farm in Texas. For the first time a Chinese company will export wind turbines to the United States.

Sunnyvale-based Applied Materials recently opened what it calls the world's largest non-government-backed solar-energy research facility in Xian in northwest China. First Solar, the Tempe, Ariz.-maker of thin-film solar panels, plans to take advantage of Chinese incentives to build one of the largest photovoltaic power plants in the world in China's Inner Mongolia region.

In 2008, Warren Buffett's MidAmerica Energy Holdings bought a 10 percent stake in BYD, the Shenzhen-based car company that plans to start selling electric automobiles in California later this year.

Beijing in driver's seat

"Unless there's a dramatic shift in national policy in the United States, the road to success in cleantech most likely goes through Beijing," said Matthew Lewis, spokesman for the San Francisco office of ClimateWorks Foundation, an international philanthropic network that promotes clean

energy. "From a policy perspective, they are doing everything right."

That could not be said of the United States in recent years, according to venture capitalist Denniston. He said annual funding for the National Institutes of Health is about \$30 billion, but just \$1 billion a year has trickled into fundamental research into alternative energy.

But the Obama administration, to the applause of the cleantech industry and environmentalists, has made a robust cleantech industry a top priority. The stimulus bill included \$80 billion to promote renewable energy. The president has also proposed spending \$150 billion in clean energy research over 10 years.

Energy Secretary Chu, in his visit to Silicon Valley, announced \$400 million in grants for academic researchers and startups developing clean technologies through the Advanced Research Projects Agency-Energy, a new organization modeled after the Pentagon's Defense Advanced Research Projects Agency, or DARPA.

Peggy Liu, a former Silicon Valley Internet executive who founded Shanghai-based nonprofit Joint US-China Collaboration on Clean Energy (JUCCE.com), says a key to the

success of cleantech efforts in both the United States and China is partnerships. "I'm afraid people are setting up China as the enemy," she said. "You need to treat China like a partner."

Many valley companies agree. Santa Clara-based National Semiconductor, which is developing technology to squeeze more energy out of solar panels, hopes to sell its products to Chinese companies.

"China for us is a major opportunity," Executive Chairman Brian Halla said. "It will be the very electronics that come out of Silicon Valley companies that will improve the efficiencies of these panels. (China-based) Suntech and others will be customers of National Semiconductor."

One concern for the valley, though, is how much China will open up competition for its massive renewable energy projects to international companies. Lawrence Berkeley's Wisner noted that Chinese government policy supports local companies and that it's often cheaper to buy homegrown technology, even though foreign-made products may be more reliable.

"The question becomes, can U.S. companies participate in that growing market?" he said.

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