

Guest Post: Will Asia Own Cleantech?

What happens when governments do back the right targets in cleantech?

The most common objection to any form of industrial policy is that governments, as opposed to markets, are considered unqualified to select those sectors most worthy of investment. But what happens when governments **do** pick the right targets and then back that up with the resources, influence and patience needed to guide and support these fledgling industries to long-term success?

Central government programs in Asia, most notably in China and Korea, are indeed on the mark as they mobilize public policies and resources in order to subsidize and nurture their domestic cleantech industries. Emerging sectors such as solar power, wind power and electric vehicles are all characterized by the need to achieve scale before they can be cost-competitive. This makes the availability of subsidies a matter of critical importance. Additionally, extensive coordination between public and private interests (something best provided by central governments, the more central the better) is vital to creating the complex infrastructure required for a large-scale shift to renewable energy and electric vehicles.

Evidence is mounting that government-subsidized R&D, beneficial manufacturing conditions and cheap capital are helping to tip the scales in favor of Asian companies or Asia-based joint ventures competing in certain large sectors of the global cleantech industry. At the very least, Western players in many cleantech sectors are increasingly required to develop a strategy to work with Asian partners in order to compete. Meanwhile, the divisive political climate prevailing in the U.S. has not produced a cohesive and forward-looking energy policy. To make matters worse, the 2010 midterm elections brought to Congress many lawmakers whose primary agenda is to limit government spending and government influence -- i.e., the antithesis of the industrial policies that have made China and Korea emerging cleantech powers.

This article will provide some examples of conditions in Asia that are stimulating and supporting the rise of domestic cleantech businesses. We conclude with some analysis of U.S. cleantech investment strategies that we believe will succeed in spite of, or in alignment with, these trends.

The following numbers illustrate our argument:

One Million. This is the number of all-electric buses (EV buses) that China's latest **5-year plan** calls for by 2020. This is a lot of buses, considering that the EV bus business is even less developed than the EV auto industry. China may well fall short of this specific goal, but the fact remains that the central government wields significant power to jump-start the domestic EV business, in this case by purchasing municipal buses. Orders are beginning to materialize; in September of last year, Hunan Province awarded a contract for 1,000 all-electric buses complete with rooftop solar recharging units. China's efforts to create a market for EVs does not **necessarily** mean Chinese companies will be the beneficiaries, but this is not a bad assumption.

The **winner of the Hunan bus order** was BYD, the Chinese auto, advanced battery and electric vehicle company founded in 1995 and financed to great fanfare in 2008 by Warren Buffett. Unlike Japan and Korea, where giant corporate conglomerates dominate, China is known for the proliferation of small to medium-sized businesses that spring up to meet market needs. BYD has quickly carved out a space in lithium-ion battery production and has ambitious plans to supply electric vehicles to China and the world. As they strive to improve product quality and achieve economies of scale, it won't hurt to have large government orders boost their progress.

China is using these kinds of municipal purchases as well as consumer incentives to quickly drive down costs and improve quality in order to meet a goal of 500,000 electric vehicles (cars and buses) by 2015. China's government is also coordinating the development of the infrastructure needed for growth of the EV industry, including charging stations and safeguards against power disruption that may occur as a result of charging. Contrast this with the U.S., where only one all-electric vehicle (the **Nissan Leaf**) is currently available. Nissan's near-term U.S. sales goals are modest (current global production capacity is only 50,000 vehicles per year), and the current effort is not as much focused on traditional sales as it is on addressing the myriad small and large details necessary to make EVs viable in the U.S. "Mobility Teams" are focused on helping states, local officials and utilities create tax and other incentives, lay the groundwork for suitable charging infrastructure (including streamlining currently cumbersome

permitting requirements), coordinating with independent utilities to assure uninterrupted power as new charging loads come online, and otherwise wrestling with a mosaic of local government and private incentives and obstacles that need to be aligned or resolved for EVs to become a reality in the U.S.

In a related trend, non-China-based EV companies are increasingly partnering with Chinese companies, drawn to China's available capital and market potential. Relatively established U.S. battery firm Ener1 (a recipient of \$118 million in stimulus funding in 2010), with existing plants in Indiana and Korea, announced last month a **joint venture with Wanxiang Group**, a large Chinese auto supplier. Wanxiang is providing almost all the capital for a large battery manufacturing plant in Hangzhou. One planned product is battery packs for buses.

Zero. This is the **reported** total debt service (principal and interest payments) over the first five years required under the loans provided to an **Evergreen Solar** joint venture to fund most of the cost to develop manufacturing operations in Wuhan, China. This may be an extreme case, and there are signs that China is beginning to rein in lending to curb inflation. Nonetheless, China's banks are state-owned and can offer highly attractive loan terms if deemed necessary to lure capital-intensive but strategically important cleantech manufacturing operations to China. The contrast between the U.S. and China is driven home by the fact that the 800-employee Devens, Massachusetts **Evergreen plant** that will be closed as manufacturing shifts to China is a modern plant, opened in 2008, with substantial (but apparently not substantial enough) state subsidies.

Despite labor and other non-capital advantages to manufacturing in China, there is a place for U.S.-based high-volume manufacturing of emerging cleantech technologies if capital can be obtained on favorable terms. Nine advanced battery plants in the U.S. were funded by stimulus dollars. But a reprise of the stimulus program is highly unlikely in the current political climate. Without something similar, do capital-intensive cleantech technology companies have a realistic option of locating plants in the U.S.? Consider the example of **Coda**, a private all-electric vehicle company based in Santa Monica, California. Coda, which plans to launch its passenger cars in the U.S. this year, has teamed with China's Lishen Power Battery to develop its iron phosphate lithium-ion batteries and currently manufactures these batteries in Tianjin, China. Yet Coda's **public announcements** make it clear that its preferred path is to also manufacture its batteries in the U.S. A plan to build a plant in central Ohio has been on the drawing board for some time but appears stalled. We can speculate that cheap capital would make this project happen and further speculate that many other similar companies would locate operations in the U.S., despite labor cost disadvantages, if attractive funding arrangements, akin to those available in China, were available.

Eight Billion. This is the market cap of direct-drive wind turbine manufacturer **Goldwind**. When Xinjiang, China-based Goldwind completed its offering on the Hong Kong exchange last year (it has been listed on the Shenzhen exchange since 2007), the event was eye-catching for its scale -- \$1.3 billion raised and an \$8 billion market cap. Two other interesting facets of Goldwind's emergence serve to dispel certain widely held perceptions of China businesses and possibly to prepare us for the future: Goldwind is a technologically innovative, homegrown brand serving a rising Chinese market.

Goldwind's products are based on advanced engineering designs and precise manufacturing. Whether the company's innovative designs amount to subsidized R&D is a matter of semantics because Goldwind is a state-owned enterprise. Regardless, this is not the earlier version of China manufacturing that propelled the country's 30-year miracle on the strength of low-cost labor and questionable product quality -- the phrase "happy with crappy" has been applied to the manufacturing mindset that prevailed as China carved out its initial foothold in the global economy. Now, faced with a flat to declining work-age population and the reality of other emerging economies such as Vietnam and Pakistan moving to occupy China's former position at the bottom of the labor pay scale, China is moving in its steadfast and unified way toward either end of what has been termed the **Smiley Curve**.

Plotting the relative value or profit derived from the sequential stages of a product business yields a curve named after the smile on those ubiquitous yellow buttons or decals: starting high with Brand and steadily descending through Design and Engineering to a nadir of Manufacturing, the curve rises again to Sales and eventually to Service. China's roster of globally recognized brands is short, but we can add Goldwind to the list. Others will surely follow. As for moving toward the other high-value end of the Smiley Curve -- sales and service -- it helps that as its economy has grown 20-fold over the last thirty years, China has become a formidable market, not just a favorable manufacturing location. Most of Goldwind's turbines are installed in China, which is now the world leader in wind power. Scanning other sectors, Chinese consumers now buy more cars than the U.S. and more mobile phone handsets than the rest of the world combined. The country also leads the world in resource utilization, accounting, for example, for over 40 percent of the world's coal consumption.

An interesting tangent to the Goldwind story involves a key component of their direct-drive turbines: permanent magnets utilizing rare earth elements (REEs). REEs allow permanent magnets to be smaller, lighter and more powerful. However, rare earth production is dominated by China and, as duly noted in the Western press, diminishing quotas have been restricting REE exports. The rest of the world is becoming alarmed about the potential to stunt the growth of certain REE-dependent industries everywhere else but within China. REE applications also include certain military devices, raising strategic concerns in the U.S. and elsewhere. The result has been a surge in global junior mining of rare earths, especially in Australia and Canada, and the re-opening of California's Mountain Pass mine by **Molycorp**, the strongest performing venture-backed IPO of 2010. Molycorp intends to forward-integrate into the production of permanent magnets. However, as another example of the critical role of Asian companies in emerging cleantech industries, Molycorp's plans required **partnerships** with Japan's Hitachi Metals and Sumitomo Corp, the holders of manufacturing know-how and key patents surrounding REE permanent magnets.

Seventeen. This surprising figure, as reported by the **NVCA**, is the number of China-based companies backed by U.S. venture capital that completed their initial public offering on U.S. exchanges in the fourth quarter of 2010. The U.S. is recognized as home to the best conditions and ingredients for venture success, such as leading universities and venture capital firms, entrepreneurs and entrepreneurial culture, and supporting service providers. But if you look at a region's ability to produce companies that become venture-backed IPOs as an indicator of the presence of these key ingredients, then this number -- seventeen -- serves notice that U.S. domination of new venture creation may be diminishing. Granted, the quarter was the best period for U.S. offerings in many years, with 34 venture-backed IPOs. But the fact that fully half of the period's venture-backed IPOs were China-based is an astounding proportion when you consider the logjam of venture-backed U.S.-based companies funded over the last decade that have suffered through a long IPO drought and a mediocre M&A environment, the best of which are now vying to become public as the window re-opens.

Note that these seventeen companies include only those China-based companies listing on U.S. exchanges. Asian IPO activity, including the rapidly growing Shenzhen and Hong Kong exchanges, now produce as many or more IPOs as the U.S. and Europe combined. The U.S. has historically enjoyed a commanding lead in venture infrastructure, from technology to venture capital to service providers supporting entrepreneurial companies to IPOs. This U.S. lead remains intact at the current juncture, but the gap is rapidly closing.

Implications for U.S.-Based Cleantech Venture Capital Investing

These facts and figures send a clear message: cleantech venture capital in the U.S. faces a formidable foe in the government-aligned emerging players in Asia. For one U.S.-based fund, SJF Ventures, an overarching element of the firm's strategy, whether it be cleantech or other sectors, prevents us from taking the brunt of Asia's competitive strengths: we have always specialized in capital-efficient business strategies. Specifically with respect to cleantech, we have focused on segments and capital-efficient strategies that we believe can compete and win despite developments in Asia. However, we recognize the increasingly global nature of cleantech and know that we must maintain strong ties in Asia in order to facilitate joint ventures, partnerships and mergers/acquisitions that benefit our U.S.-based companies.

What is the profile of U.S. cleantech companies that we conclude can compete and win in a changing global setting? One such target is technology-and-knowledge-based services. For example, SJF's most recent cleantech investment Community Energy (CEI) is a leading renewable energy developer delivering utility-scale solar and wind projects nationally from its offices in Pennsylvania and Colorado. CEI does not place bets on any particular solar or wind technology. Moreover, success factors in their business, which include experience, project design, utility relationships and project-finance expertise, are far removed from the capital availability and manufacturing advantages of Asian cleantech players. However, CEI -- and SJF as its lead investor -- cannot afford to ignore the many Asian firms that populate the supply chain of the highly globalized renewable energy industry. China's solar panel manufacturers now account for over half of worldwide production. In the highly competitive solar panel business, a recent trend is companies seeking to downstream-integrate into project development in order to dictate the deployment of their products in new projects.

Two other recent SJF cleantech investments, eRecyclingCorps (eRC) and Optoro, are reshaping key components of reverse logistics within the electronics industry, leveraging proprietary technology and systems as well as deep industry relationships. Similar to CEI, these businesses are largely immune to Asia's competitive advantages due to the vast and readily available domestic supply of used electronics for resale. ERC even takes advantage of market arbitrage by collecting used smartphones in a highly subsidized U.S. handset market and reselling them in like-new condition and fully refurbished in the mostly unsubsidized Asian markets. However, once again, each company operates in a global industry where strong

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relationships with Asian partners will be key to success in accessing sales channels and establishing processing operations.

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