

The Real State of “Cleantech” Investing

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Cleantech as we see it continues to be a large opportunity — one that we believe will create significant impact and positive returns — despite what the pundits are saying. Worldwide, 500+ million affluent people enjoy an “energy and resource rich” lifestyle, but five billion people are still striving for this prosperity. The only way to bridge this gap is innovation and increased resource efficiency. But the pundits in search of stories focus on the examples of a few well-highlighted but probably predictable failures, like Solyndra and A123, thus scaring off potential investors; and, unfortunately, it appears that fewer good ideas are getting funded. This challenging environment calls for different strategies than have been taken in the past. It is possible that existing technology and business-as-usual will be able to handle the projected growth in demand for energy and resources, but they will do so only at an increasing cost. This would place a growing drag on the economy long term and would create increased systemic risk. Instead, we can invent and commercialize new technologies that provide far better alternatives to the current methods in these markets. Given the trends of business-as-usual, markets for truly economic sustainable technologies that impact our resource development or consumption will flourish in the long term. As we like to say, new technologies that meet the “Chindia Price,” by reaching unsubsidized market competitiveness and obeying the “laws of economic gravity,” will do well if they can survive until they scale. Survival of good technologies unfortunately will not always be assured.

Focus on “maintech” creates large option value

We believe the more mainstream (“Maintech” or unsubsidized cost competitiveness in a broad array of mainstream energy businesses) and less niche (“Cleantech” or the subsidized carbon price dependent world) target markets for a technology, the better the economics and the less probable the dependence on regulation and subsidies. From the beginning, Khosla Ventures has had an investing strategy around Maintech, not around the conventional interpretation of Cleantech representing our philosophy of supporting a broader set of Cleantech technologies that have Maintech economics. This is a much more holistic view than how “Cleantech” is conventionally interpreted in the press, which tends to think of it as just solar, wind, and electric vehicles. With our Sustainability strategy, we invest in many different categories — utility-scale clean energy generation (solar thermal), distributed generation (rooftop solar or efficient power generation engines for buildings), mechanical efficiency (engines), electrical efficiency (LED lighting), batteries, biofuels, biochemicals & bioplastics, materials (glass that blocks light at the push of a button), and agriculture (reduced fertilizer use) & food (produced more efficiently). This diversity limits the effects of any one segment going out of fashion, reducing the risk of the entire portfolio. Being so widely diversified has insulated Khosla Ventures and other funds that have taken this approach, while traditional Cleantech investors, who concentrated in solar, wind, or batteries alone, have generally not fared as well. With a little luck, we currently expect almost all of these categories to be individually profitable in our portfolio. Given our Maintech focus the consequences of failure are

losing one times our money, but the large markets make the option value of success very attractive in our view.

The Nature of Disruption: A few win, place or show but most lose!

Cleantech investing and its outlook have recently been marred by the publicity, politics, and headlines around a few notable failures. When a new market emerges, be it solar cells, biofuels, engines, LEDs, networking, storage, search, mobile, or anything else, technologists jump in and innovate. But, for every ten startups with new technology ideas, there are, at best, only a few winners. I like to say that, in any new technology horserace, there are only a few that can win, place, or show for performance and cost effectiveness. The others, the majority, will likely perish or be acquired for residual value. The failures of Solyndra and A123 should be viewed in this light.

Making mistakes and having some failures is par for the course when you're backing new technologies, some of which may be at the very early stages. We've made our own share of mistakes here, e.g. investing in corn ethanol technology that wasn't advanced enough to be competitive (corn ethanol simply can't reach the Chindia Price and was a big blind spot for many) but realized our mistake very early and stopped funding this area. As markets begin to form, all technologies look good, but, by the mid-to-late stage, some become clearly uncompetitive. Most competitors will fail to win, but the winners will reap big rewards. Most ventures will lose money according to venture industry statistics, but more money will be made than lost. This is why venture funds can still have good returns even when most startups fail. At Khosla Ventures, we currently expect to do better than industry averages by keeping our losing companies to a minority.

This isn't surprising to those of us in the technology business. To be specific, Solyndra, Miasole, and other solar failures should be expected. A123's technology was not a materially differentiated leap forward in automobiles or batteries, a fatal flaw for a newcomer trying to break into a market. There were many search engines early on, but now principally Google and Bing remain! Within our portfolio, we had both Range and Kior as part of our biofuels strategy. But, as soon as it became clear to us that Range would not be able to compete with Kior and other technologies on fuel costs, we stopped investing in the Range technology and suggested to the board and management that they [adopt fermentation instead of the catalysis approach](#) they had been taking (something they failed to do — agility, not religion, is often the key to a venture's success and pivots in strategy are common for the successful ones). Similarly, it was clear to us that [solar cell technologies](#) that were chasing First Solar (the incumbent) to get to 12–14% efficiency would not be able to compete against the incumbent technology. When we have invested in traditional categories like solar, we've chosen carefully. For example, we backed Ausra in solar thermal and sold it at the right time to the French nuclear giant Areva. In solar cells, we invested in Stion to compete with silicon at 18–20% efficiency, instead of targeting First Solar and we still expect a good outcome despite the many failures in the thin film solar business. More recently, while most others have stopped investing in solar, as contrarians, we invested in two brand new solar cell startups. Disruption opportunities don't stop just because Wall Street sentiment turns negative.

Sometimes we are right in our assessments and sometimes we are dead wrong, but that is the life of a technology investor. Understanding that there will be some failures, we rely on small investments as risk reduction to judge where to make bigger investments and get larger returns, and even take a few home run swings where we tend to double down with full insider knowledge in private companies. We have to be disciplined and think about the long term, because our typical investment period is not one quarter (like on Wall Street), but typically 5–7 years! So, there is plenty of opportunity to be wrong, and success relies on supporting technologies and entrepreneurs with the potential to do big things through the challenges they might face along the way. The press and public markets, on the other hand, wrongly focus on the short term and the early failures and successes because they make visible stories. It takes discipline not to get distracted by short-term events like hot or cold stock markets in the sector, press stories on companies like Solyndra, and the rest of it.

Performance to match any benchmark

So how well has Khosla Ventures done? Though we don't disclose returns, it is fair to say that, since we started investing in Cleantech and Information Technology in 2006 with the current team, our returns have well exceeded typical venture funds, be they Cleantech, Information Technology, or Biotechnology funds. Even if we calculate the returns just on our Cleantech investments, we still exceed the performance of most more general venture funds, even in today's depressed Cleantech market, and produce attractive results for our limited partners. More importantly, when we raised a new fund (we only work with knowledgeable, sophisticated investors, almost exclusively institutions) we were oversubscribed during a tough time for the venture industry. I offer this, with apologies, as it is not meant to sound arrogant but rather to defend Cleantech investing as a sector, as proof that Cleantech investing can generate good returns for investors, contrary to the current misconception. Of course, past results are not indicators of future performance, and luck and circumstances beyond investors' control always play a large part in all investing. Some of the problem of perception (and we had our share of problems and upsides too) is the fact that there are many investors who follow the latest fad and chase excitement. Cleantech went through a time when it was in vogue, and now it is not. We have seen similar fashions arise elsewhere, for example, in dotcom investing in the late nineties (Google was born during the "bust") and, more recently, in social/mobile startups. What is clear from such trends is that long-term value is created in nearly every important sector, but often in different places than most expect when a sector is at the height of fashion.

The financing environment for Cleantech companies is tough today, given the negative fashion sentiment, but good companies with highly differentiated technologies *are* getting funded. Each capital raise might be more of a grind and take longer than when Cleantech was in fashion, and fewer investors are interested in even looking. But, Khosla Ventures has had eleven Cleantech financings so far in 2012, each at an increasing valuation, and these financings have raised about \$500M in equity and substantially more in debt for our companies.

We are much more ready to abandon or sell a technology in Cleantech today if it fails to be highly differentiated, because one has to anticipate a continuing negative Cleantech funding environment that will limit the ability to raise equity financing for these companies in the future. But, the aggregate results

are still attractive and, more importantly, contrarian investors who invest at today's much lower valuations will reap the rewards if companies deliver on their promises. Sometimes, one company missing its IPO forecast, as Amyris has done, can create buying opportunities in the sector. But, one needs to be extremely cautious ("don't try this at home" applies), as Cleantech investing requires highly technical judgments about what might or might not work about a technology.

We don't mind investing in companies that have high failure probabilities, but we like to see big wins if the technology succeeds. That's why we focus on the best teams with differentiated technologies and the potential to be disruptive. We ignore the hype cycle, because short-term trends are not meaningful when it comes to venture returns. We will continue to place new bets in Sustainability technologies, along with our regular focus on information technologies. We will continue to invest small amounts of money when technology risk is high; as the risk declines, this creates an opportunity to make much larger investments. One has to anticipate a continuing negative Cleantech funding environment (and a future up cycle is likely too) and keep in mind that this will limit the ability for these companies to raise equity financing in the future. Usually, the bulk of our investment in any given venture comes when the risk is lower and the technology path clearer (but still not always clear). There are times when we get excited about companies (sometimes warranted, sometimes not), but not taking risks seems like a sure way to lose in the technology business.