

Dow Jones Alternative Energy Innovations 2009
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Executive Summary

Alternative energy continues to attract venture funds, despite the fact that the number of deals and deal flows declined this year, as the Great Recession has taken a toll in all sectors. Solar will continue to shine, although the sun will set for many vendors because the market is too crowded, and what may work in a lab may not be feasible in real world. Wind is making some noise, but the biggest winners will be in energy storage—batteries. There are huge opportunities, for instance, for delivering highly efficient Lithium-ion batteries on a massive scale or making smart grid a reality at affordable prices.

The Changing Alternative Energy Landscape: What Will It Take To Find Success?

Alternative energy remains the fastest growing investment area for venture capitalists. The current Washington administration's focus on this area has only added to the interest by investors. However, the U. S. is catching up with other governments—especially Brazil, Chile, China, India, and several EU nations—in terms of public funding. The U. S. Department of Energy Secretary “Steven Chu is a brilliant guy [well, he won the Nobel Prize!] who has attracted an extremely talented team,” not bureaucrats, but smart folks from the private sector and the VC community. He sees VCs as agents of change. He has managed to fix in less than a year the damage done in eight years by the previous administration. Regarding alternative energy sources, Secretary Chu has said, “This is fruit on the ground [fresh, not rotten], not low-hanging fruit.” These are unusual times and history will look back and appreciate what the DoE is doing. On the other hand, debt markets are still gun shy and want Plans A, B, and C before they lend any money. Low-carbon economy will become mainstream in the long run.

Keynote Interview: David Mohler, Vice President & Chief Technology Officer, Duke Energy

Duke is the largest power generator in the Americas, with over 40,000 MW installed capacity—all to be replaced by 2050. If measured by installed power-generation capacity, Duke would rank as the 41st largest country in the world. Duke and PG&E (California) are leaders in deploying alternative energy sources. Duke has built wind and solar plants, and is exploring smart grids, cleaner coal, and CCSU—Carbon Capture Sequestering and Utilization. It believes smart metering is building a network that is open and interoperable. We need to develop software that takes the data from the grid and uses it wisely. This technology should then be rolled out to the consumer. David spent \$28,000 on solar panels for his home in North Carolina, where the average annual family income is \$42,000. While he and his family are on vacation in summer, the solar panels are still working, but the energy is wasted. Why can't he transfer that energy to his neighbor? Akin to distributed computing, think of distributed power. Utility is a value optimizer, not a gatekeeper. “We just replaced a meter in Cincinnati that was installed in 1896!” “There is a fear that partnering with China is like inviting a Trojan Horse. China is building rapidly and we better be a part of the action, or we'll be left by the wayside. We'll create jobs in both China and the U. S.” Utilities buy intellectual property, not create it.

Keynote Interview: Charles Gassenheimer, Chairman & CEO, [Ener1](#)

Ener1 used to develop power for the military, bought Delphi's Lithium-ion battery technology and called it Enerdel, eventually became Ener1; Charles joined Ener1 in 2006. There are over 70 Li-ion-related companies in the U. S. Barriers to entry are high because of the high CapEx. This industry is anti-VC—you put in huge amounts of money upfront, build capacity, and then find a customer. Patience and persistence pay off, [A123](#) IPO proved that; however, A123 stock has since gone from \$28 to \$14. The energy storage industry is probably ten times bigger than solar. Everything is not black and white; there are lots of shades of gray. Ener1 received \$118 million for the Federal stimulus plan. The U. S. has set aside \$5 billion for battery technology. In plug-in hybrid cars, 30%-40% of the weight is batteries!

There are arguments—both pro and con—on the stimulus plan. Is the money going to U. S. companies that are manufacturing in China? Ener1 expects almost \$400 million from the stimulus and has a plant in the U. S. A123 manufactures in China and Chinese automaker BYD has plans to build cars in France. As an aside, look at BYD's logo (Figure 1).

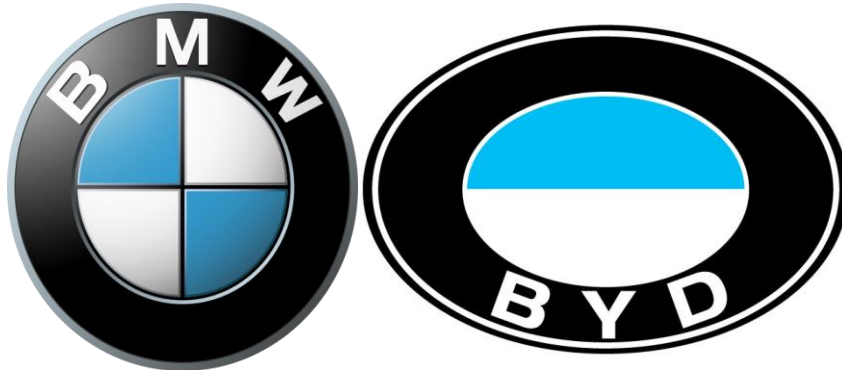


Figure 1. BMW and BYD Logos

China's Suntech Power just [announced](#) plans to open a manufacturing facility in Arizona. "China manufactures by hand," whereas Ener1's plant will be fully automated and of automotive grade, not just laptop-grade. Government money is an accelerator, not a make-or-break. Ener1 is converting the entire Japan Post fleet into all-electric and also has won contracts from Volvo for electric cars to be built in Finland. The average military vehicle gets 5 mpg. There is a huge demand in the military, and Ener1 won a contract for the Humvee. It is possible to build a successful company in the Li-ion industry. While cleantech is exciting, you still have to block and tackle; 'around the corner' is not two months, but 10 years! Asian nations (Japan, Taiwan, and South Korea) lead in Li-ion technology, having pioneered it in laptops and other portable devices. Are we wasting taxpayers' dollars to fight a battle which we may have lost already? The State of Michigan has invested over \$500 million in attracting Li-ion battery manufacturers for cars. Is this wise? "Michigan can't seem to wean itself away automobiles," said an attendee from Michigan.

Panel Discussion: Navigating The Halls of Power: How Can Investors & Entrepreneurs Do it Right?

Alternative energy investors are trying to figure out the political winds that are blowing both in Washington and in capitols across the country. The Obama Administration and local governments have put in place special incentives and grants to fuel activity. Washington is a P&L center and should be viewed as such. Representative Ed Markey (D-Massachusetts) and Senator Jeff Bingaman (D-New Mexico) need our support because they believe in cleantech and energy and creating jobs. The DoE is going through a DNA transplant and is changing rapidly. The folks who are doing these have done a remarkable job in this transformation. All the ARRA spending has to be completed by 9/30/2010. The DoE's annual budget is \$25 billion, one-third of which goes to nuclear. All four branches of the Department of Defense are seriously looking into alternative sources of energy; the Navy is looking at algae as an energy source. Secretary Chu is not in the business of picking winners and lets technology and customers decide it.

Keynote Interview: John Skinner, Director, Marketing, Eco-Innovation, Intel

Intel uses 1.3 billion Kwhr—one-half its annual consumption—from renewables. A utility-grade wind turbine on an average contains 15 Intel microprocessors. "We are getting wind speed and direction forecasting using supercomputers. We need to get Moore's Law to chips—double the number of transistors every two years and halve the power consumption." Today's power supplies are about 70% efficient, the rest is lost as heat; we need to make them achieve 80-90% efficiency. What are the best cooling and power technologies? What are the best practices? \$4.5 billion of the Federal stimulus plan is going to smart grids; however, [EPRI](#) estimates smart grid deployment may need \$160 billion. The goal should be to eliminate energy waste at end points—homes, factories, commercial buildings—where utilities stop and IT vendors come in. Network all the appliances in your home and monitor them.

Intel Capital has concentric circles of investment—CPU power management, extending battery life, sensors for datacenters, power management for hardware, software, energy efficiency in buildings, and thin-film voltaics. Transportation electrification is another area Intel is investing in. Beyond energy, Intel is working in China on high-speed trains. While we here in the U. S. are fighting over which states should get the \$12 billion the Federal government has earmarked on the *feasibility* of high-speed trains, China is spending over \$50 billion in *building* these! IT plays a key role in Chinese high-speed trains—rails and every axle of the locomotive and passenger cars are instrumented with Intel chips for monitoring performance, speed, safety, maintenance, etc. All the data is fed to traffic-control centers. So, what we have is not a ‘blackbox’ as in airplanes, but continuous telemetry. We should invest in finding how to use communications and computer technologies to reduce carbon footprint. One example is video-conferencing that Cisco, HP, and Citrix are preaching and practicing to a good extent.

Panel Discussion: From the Boardroom

Energy efficiency—generation and storage—leads deal flow (Figure 2) and interest in solar is waning (Figure 3).

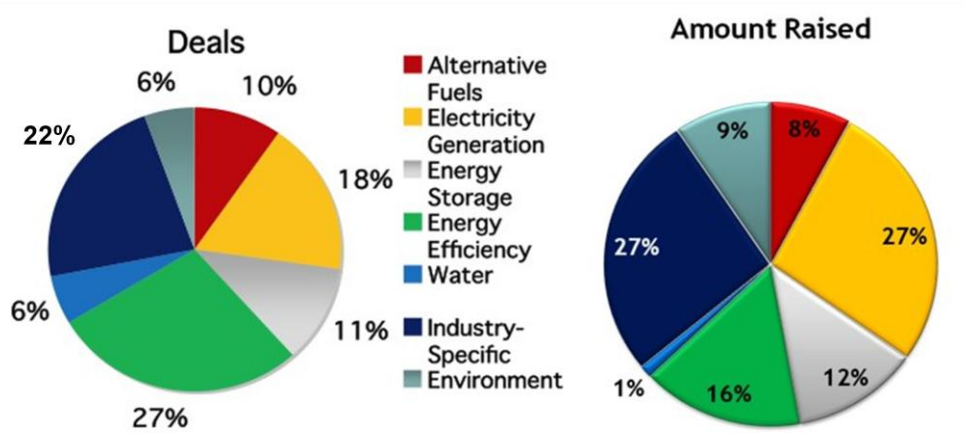


Figure 2. 2009 VC Deals in U.S. Cleantech Companies By Segment¹

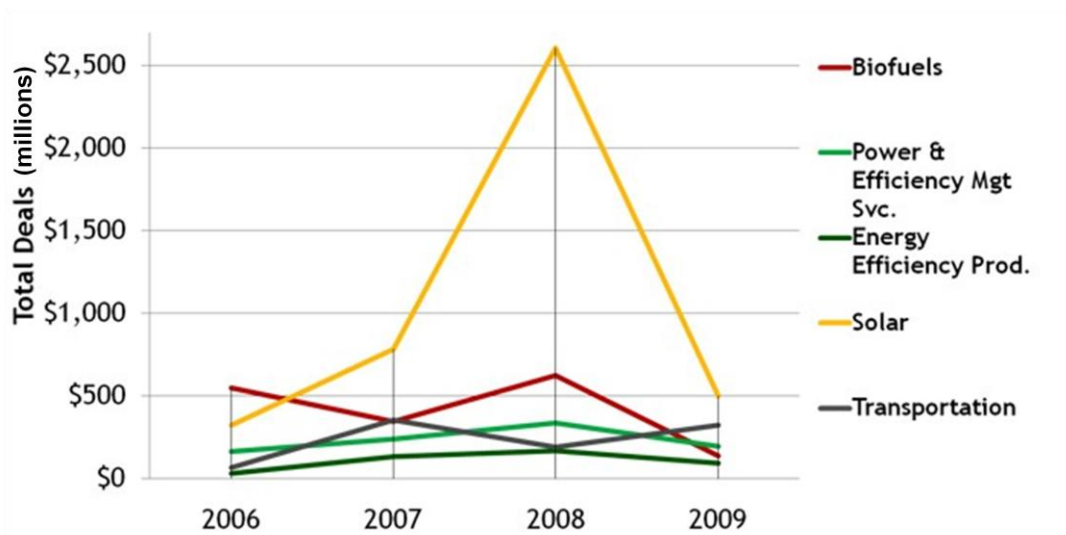


Figure 3. 2009 VC Deals in U. S. Cleantech Companies by Sector²

¹ “The State of Venture Capital and Cleantech Investment,” Jessica Canning, Dow Jones VentureSource, November 2009; contact [Kimberly Gagliardi](#) for details.

² *ibid.*

Solar

Investments in the solar space don't offer immediate payback; you may have to wait seven to eight years. This industry is highly capital-intensive. Most solar companies won't make it because VCs won't fund the huge amounts required to build pilot projects that can easily cost \$50 million, followed by even larger investments for production sites. Too many solar companies are building their own fabs. This is the wrong model. What might eventually emerge are fabless vendors with manufacturing outsourced, as the IT industry has done with the likes of [Foxconn](#) or [TSMC](#). However, solar is not done in by any means; costs are coming down; there'll be huge breakthroughs—in thin-film, [CIGS](#), coatings (e. g., [XeroCoat](#)), [BIPV](#)...

Wind Power

How big is this market? Can or would you put a windmill in your backyard? Are homeowners' associations good candidates? Opportunities for IT in wind power include turbine placement, windmill instrumentation, predicting wind direction and speed, weather warnings, etc.

Battery

No matter what the energy source is, storage is a critical issue. One major storage vendor in Silicon Valley uses flywheels instead of batteries in its datacenters. The technology that'll win in the end is the one that succeeds in the automobile industry—technology that is scalable, reliable, rugged, durable, and can be mass-produced at affordable prices.

Conclusion

Overall, this was a well-organized and -attended conference, despite the economy, with good content and lively panel discussions. Much of this industry is in its infancy, many startups won't make it, but those with persistence, patience, and viable technology will weather the current storm and succeed in the end. Think of Amazon, eBay, Google, and Yahoo! that survived the dot-com bust and are thriving.