

GO Clean Energy

April 2009 Q&A with “The Clean Tech Revolution” co-author and Clean Edge Managing Director Ron Pernick



Ron Pernick is the co-founder and managing director of Clean Edge. Clean Edge is a leading research and publishing firm helping companies, investors, and governments understand and profit from clean technologies. Pernick co-founded Clean Edge in 2000 with Joel Makower. The firm tracks and analyzes clean-tech markets, trends, and opportunities through its network of partners and affiliates. Clean Edge, with offices in the San Francisco Bay Area and Portland Oregon, offers unparalleled insight and intelligence on the emerging clean-tech economy.

Pernick is also the co-author of the highly acclaimed book *The Clean Tech Revolution* (Collins, 2007), along with fellow Clean Edge member and tech/business journalist Clint Wilder.

Pernick is an accomplished market research, publishing, and business development entrepreneur with more than two decades of high-tech experience. At Clean Edge he has co-authored more than a dozen reports on emerging clean technologies and has worked with a range of clients including multinationals, start-ups, government agencies, and investors. He oversees many of Clean Edge’s strategic initiatives including the co-production of the annual Clean-Tech Investor Summit and the creation and management of the NASDAQ® Clean Edge® U.S. Liquid Series Index (CELS). Prior to founding Clean Edge, he ran his own environmental web consulting practice and earlier helped build the brands of such Internet pioneers as Internet In A Box, Preview Travel, The WELL, and Yahoo! During his career, he has worked in the U.S. and Japan, serving both emerging and established companies.

Ron is adjunct faculty at Portland State University where he teaches an MBA-level course on clean-tech entrepreneurship and is a regular speaker at U.S. and international conferences and events.



GO Clean Energy: Hi Ron, thank you for agreeing to answer GO Clean Energy's questions. Overall, with the Obama administration and with key people like Dr. Steven Chu at the Department of Energy, how much change do you see both short term and long term for clean energy in the U.S. and worldwide?

Ron Pernick: The new administration's focus on clean energy and climate bode well for a range of industries including renewable energy generation (in particular solar and wind), green buildings, energy efficiency and conservation, advanced transportation, and the smart grid. The U.S. has always been a nexus of early-stage innovation – and the government's support will be a key factor in enabling America to continue to be a central player in the clean-tech sector.

After years of promises, we still have no secure, long-term repositories for nuclear waste -- most of it is being stored onsite at the nation's nuclear power plants. You know, the nuclear industry and its proponents have been saying for decades that they'd solve the waste issue – but they haven't.

I like to remind people that there's no such thing as a subsidy- or regulatory-free energy source. One need look no further than the nuclear, coal, and oil industries to understand the importance of government subsidies and support. What's happening is that policymakers around the globe are looking at how they're going to create jobs, address energy security, meet environmental and climate goals, and guarantee their long-term economic survival – and they are shifting policies to meet these new challenges. What does all this support/focus mean? At Clean Edge, we project that many clean energy industries will continue growing at double digit rates for the next decade.

GCE: With respect to a post Kyoto agreement on reducing carbon emissions, do you see the U.S. Senate going along with a new worldwide treaty on climate change? What do you think are the prospects?

RP: Well, I really wish I had better clarity on this one. My sense is that Obama is very serious about putting a price on carbon and regulating greenhouse gas emissions. So, I do believe that we're likely to have some sort of federal-level domestic carbon regulation in the U.S. if Obama can get the House and Senate on board. Regarding global treaties, we'll have to wait and see.

GCE: At the solar front, it appears that First Solar broached the \$1/watt mark at 0.98c/watt in time for Obama's inaugural address. Do you see thin film photovoltaics improving their cost-performance ratio over silicon or do you think silicon also has some tricks up its sleeve?

RP: The solar industry is moving from a niche to a large-scale industry – and with it will come significantly lower prices for both new emerging thin-film technologies and from the incumbent crystalline silicon players. Back in 2003 there was just 600 MW of solar PV installed worldwide. Last year we saw nearly five times that amount, close to 3000 MW, installed globally. In this high-growth environment I think the silicon manufacturers will continue to improve their economies of scale, thereby driving down costs and increasing efficiencies to compete with their thin-film brethren. This year alone we could see the cost for silicon-based solar modules from some manufacturers drop by around 25 percent. So, I think thin film and multi- and poly-crystalline players will continue to battle it out (in many cases they are actually the same companies) – with both playing a significant role for some time.

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GCE: For wind, what do you think will be the next major development?

RP: The next big development for wind will have nothing to do with “wind” per se. Yes, we’ll continue to see advances in materials and designs for wind turbine technology and in software controls for wind farms – but the real developments will occur within the two greatest challenges facing the wind industry: energy storage and grid transmission. What are we talking about? Breakthrough storage technologies (both distributed and centralized) to “firm up” wind’s intermittency and new advanced transmission lines to carry all of these green electrons from wind centers to cities. One of the most interesting developments in 2008 was the announcement that the Texas PUC approved approximately \$5 billion in new transmission lines to accommodate new wind farms being built in that state.

GCE: What about energy storage, any thing new and interesting in this area? We heard that some of the techniques being used (or considered) include storing compressed air in old salt mines.

RP: As I mentioned above, this will be one of the most important areas of development within the clean-energy sector. There are two pathways currently being pursued – large scale central storage like the compressed air and molten salts that you mention and distributed energy storage that can happen within a building or along the utility distribution system. The latter includes technologies like advanced lithium ion batteries from companies such as A123 and sodium sulfur technologies from NGK Insulators and others. There’s also, of course, development of V2Grid (vehicle to grid) technologies that could enable idle cars to be tapped for their stored energy (pulling electrons from their batteries onto the grid when the cars aren’t in transport use and the grid is constrained).

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GCE: Regarding nuclear energy, the nuclear industry has been touting their safer and cleaner technologies. As far as waste handling and disposal goes, are there any developments in that area? How much of a problem is nuclear waste in the U.S.?

RP: After years of promises, we still have no secure, long-term repositories for nuclear waste -- most of it is being stored onsite at the nation's nuclear power plants. You know, the nuclear industry and its proponents have been saying for decades that they'd solve the waste issue – but they haven't. The other big issue with nuclear power: where you have nuclear waste you have the ability to produce nuclear bombs and for terrorists to exploit security weaknesses. I think the rebirth of the nuclear industry in the U.S. is dead on arrival.

GCE: There has been a lot of talk about clean coal, either liquefaction or carbon containment and sequestration. Where do you think that technology is heading? Is it going to be usable any time soon?

*RP: In our book *The Clean Tech Revolution* we call “clean coal” an oxymoron. I still stand by that descriptor. Sure, we'll see some advancements, and China and the U.S. will have to figure out ways to make coal “cleaner,” but it will be a long time, if ever, before coal joins the clean-tech ranks. That doesn't mean that “clean coal” technologies won't be pursued, but for the foreseeable future coal will remain one of the most polluting forms of energy production.*

GCE: Any final words for our readers?

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RP: Clean tech, like the rest of the market, faces considerable challenges in the wake of the worst financial and credit crisis in generations. But the technological, political, environmental, and financial forces behind clean tech are so strong – that we believe the sector will stand as a cornerstone of the next global economic recovery. Indeed, for those interested in working in the sector, I believe it offers the promise of lifetime job security. The transition to smart, clean technologies will take decades to complete.

GCE: Thanks Ron.

RP: Thanks for having me.

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