

WIND

CALIFORNIA STUDY CALCULATES BENEFITS OF CLEAN ENERGY INNOVATION

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Last week, Michael Norton's January 4th article for the Provincetown Banner, Eight More Cape Winds? questioned the efficacy of Massachusetts partnering with research institutions and offshore wind energy experts to reduce the cost of offshore wind by 40 percent by 2020 and 60 percent by 2030.

Norton's article, like so many others that have monopolized media headlines for years, discounts the relevance of green energy research and innovation. Are American journalists simply dismissing the economic adrenaline that a Clean Energy Industrial Revolution would deliver, or do they genuinely lack the awareness of resource economics, which compelling pairs job creation, corporate profits, and long-term economic sustainability?

Maria Bartiromo, Anchor of CNBC's Closing Bell, proclaimed last Friday on MSNBC's Hardball Show with Chris Matthews, "If there's one thing we need to protect

in this country it's innovation. We need to be manufacturing again. We need to sell products to the rest of the world."

When David Corn, Washington Bureau Chief for Mother Jones Magazine, offered Bartiromo the solution that a clean energy economy could enliven abandoned U.S. factories by producing the components we currently import from other counties, particularly China, Bartiromo, like so many economists looking for a quick profit replied, "Come on, come on...going green won't work."

Fortunately, there is economic evidence to the contrary. Going green can work. The recently released Energy Policy paper (Part II)\*, co-authored by Mark A. Delucchi, Professor of Transportation Studies at the University of California, Davis, and Mark Z. Jacobson, Professor of Civil and Environmental Engineering at Stanford University, is opportune in that it clarifies the marked distinctions between the cost of wind-powered energy, for example, and traditional fossil fuel energy sources, such as coal. The authors' November 22, 2010 report validates Massachusetts' aim in pioneering increasingly sustainable clean energy solutions beyond the recently approved Cape Wind project.

In Delucchi and Jacobson's 21-page study, which was not funded by any interest group, company, or governmental agency, the authors' findings are telling: When the "external costs" of coal (the human health and environmental burdens of burning coal to make electricity) are combined with coal's production costs (mining, transportation, etc.), the price for coal-based energy in 2005 ranged from a low of \$0.082 per kilowatt-hour (kWh) to a high of \$0.290 per kWh. Looking forward to 2030, the authors' models project coal's combined production and external costs in the range of \$0.10 to over \$0.30 per kWh.

This is profoundly important information, considering that the U.S. Department of Energy reports that as of 2008, top performing wind farms in areas with excellent wind resources had costs averaging only \$0.059 per kWh, significantly less than the current and projected costs of coal-based energy, documented by Delucchi and Jacobson.

Moreover, Delucchi and Jacobson's paper presents, in Table 1, that the "generation and conventional transmission costs" for onshore wind power ranged from \$0.04 to \$0.07 per kWh in the last five years, pairing nicely with the Department of Energy's calculations. Offshore wind power, while generally more expensive than onshore wind, is presented in the report as costing about the same as coal, when the health and environmental burdens of coal's external costs are incorporated. Offshore wind power, however, is projected by the authors to be less expensive than coal by 2020-2030.

Delucchi and Jacobson's statistics debunk the distorted calculus of fossil fuel pundits, who routinely misguide American consumers (and journalists) into believing that clean energy innovation and U.S. economic vitality are mutually exclusive.

The authors' paper concludes: "Evaluating the feasibility of providing all energy for all purposes everywhere in the world from wind, water, and the sun (WWS), the barriers to a 100 % conversion to WWS power worldwide are primarily social and political, not technological or even economic."

The researchers' findings not only validate the metrics championed by social economists, like James Hansen, Bill McKibben, Thomas Friedman, Eric Pooley, and James Hoggan, who each support a major shift in U.S. energy policy, but they also pass scrutiny with world-renowned Venture Capitalist firm, Kleiner Perkins Caufield & Byers. In a 2008 telephone interview, John Denniston, KPCB's Green Team leader, shared his perspective as to why there remains resistance to U.S. energy reform and

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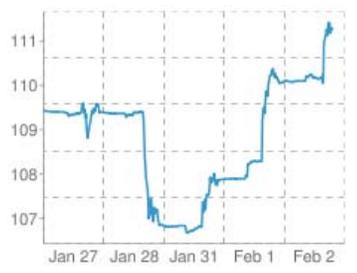


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clean energy advancements. In two words Denniston remarked, "Public perception."

Last week, Representative Rush Holt, of New Jersey, mirrored Denniston's view. He described on MSNBC's Rachel Maddow Show what he sees as an "anti-science agenda" that seeks to disparage scientific breakthroughs in clean energy and roll back epic environmental achievements, such as the 1970s' Clean Air and Clean Water Acts. Rep. Holt, who himself supports reenergizing the American economy through energy innovation, decries the disdain of opponents who allege that energy reform is "nothing more than malarkey."

The lack of alignment between fact-based clean energy economics and the public's perception of its viability (what Rep. Holt calls the "evidence-free zone" of thinking) may explain, in part, the failure of legislative energy reform in 2010. Recent Gallup and Pew Research Center polling data reveals that public interest in energy modernization and climate action has declined significantly over the last three years.

While it is true that the disparity between clean energy fact and fiction is largely the work of well-staged and well-financed fossil fuel corporate messaging, surely a country in need of an economic-energy boom can see beyond the crafty ads portraying "regular Americans" endorsing offshore oil exploration and coal mining as the future of American innovation. On the contrary, acknowledging that fossil fuels carry profoundly heavy environmental and human health costs, and that paired side-to-side, renewable energy is not only cleaner and safer, but also economically competitive, change becomes the easy option, not the mystifying, destabilizing conundrum opponents portray.

Imagine the U.S. shifting its collective perspective just a fraction of a degree, but far enough that it embraces Delucchi and Jacobson's model? Imagine Americans back to work building and manufacturing, for example, windmill blades, towers, and turbines; thin-film solar components; wave-powered electrical generators; urban and rural bike-ways, efficient transportation vehicles, and an updated national energy grid!

And if pragmatic economics alone are not enough to change a nation's outlook, perhaps focusing on the core pride of our nation should be!

Dr. Carl Safina, one of the world's leading marine researchers, reflected on this topic when he wrote in *The Washington Post* December 21st, 2010: "As several writers including myself have pointed out, U.S. leadership on climate change and energy innovation is also very much about national security, patriotism and rebuilding the economy. The nation that owns the energy future will own the future...but the United States has to decide it wants to lead."

\*Delucchi, M.A., Jacobson, M.Z., Providing all global energy with wind water, and solar power, Part II: Reliability, system and transmission costs, and policies. *Energy Policy* (2010), doi:10.1016/j.energpol.2010.11.045

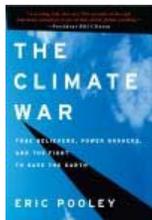
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Yes. Clean Energy Innovations have many advantages. Here is an interesting analysis on the subject: "This country is at an economic and environmental crossroads and needs to chart a more sustainable path forward. Innovation in the energy sector has the potential to be a critical economic driver and opportunity. America's business and policy leaders must embrace energy innovation now or cede market leadership to China or other countries already flexing their economic muscle in this sector. Congress has the chance to generate substantial, long-term economic benefits, protect the environment, and address the country's long-term energy needs, all by supporting innovation and expansion of America's clean energy industries. Today in Washington, the Clean and Safe Energy (CASEnergy) Coalition will join with leaders from the manufacturing, economic development and wind energy sectors to unveil a "Policy Roadmap for Clean Energy," which makes the case for a diverse U.S. clean energy portfolio that places a premium on job creation. The roadmap makes four broad policy recommendations to chart a viable course for a sustainable clean energy policy: 1 – Enact policies to take control of America's energy security Ninety-five percent of the country's transportation infrastructure is powered by oil, and more than half of it comes from overseas. Federal support for electric and hybrid vehicles is a good start to correct this dependency, but those vehicles will only be as clean as their electricity source. The current electric grid won't be able to handle large volumes of renewable energy technologies unless it's modernized. Advanced nuclear energy facilities operating 24/7 will be needed to help green the vehicle fleet. 2 – Ensure access to financing for clean energy projects Access to capital is the biggest hurdle clean energy developers face. Credit is still tight and private investors are leery of financing large infrastructure projects without guaranteed rates of return. Federal incentives, such as clean energy loan guarantees, help ease access to capital markets and ultimately reduce the cost of electricity to consumers. Existing loan guarantee authority for nuclear energy makes possible only two or three more projects. President Obama has proposed tripling the loan guarantee volume available for new plants as part of his 2011 budget. It's a step in the right direction, but the Electric Power Research Institute estimates America will need at least 45 new reactors, alongside similar increases for other clean energy sources, in order to meet the 42 percent cut in greenhouse gas emissions outlined in last year's Waxman-Markey energy bill. 3 – Increase investment in clean energy jobs Another challenge is training a new generation of workers because half of the nuclear energy industry's workforce will be eligible to retire during the next decade. Nuclear energy alone could create as many as 70,000 jobs in the coming years if all of the plants that are needed get built. Federal job-training grants are critical to ensure that eligible companies in the clean energy supply chain will be able to fill high-paying jobs with American workers. 4 – Address nuclear used fuel storage needs For five decades the nuclear energy industry has securely safeguarded used fuel at nuclear plant sites as a bridge to longer-term solutions. Federal action on storage as well as support for research into advanced, proliferation-resistant recycling technologies would allow America to extract the maximum amount of energy from the fuel while minimizing the amount that requires disposal. Such economic development, energy security and clean air benefits should not be limited to Waynesboro, Ga. Clean energy companies are ready to hire, creating thousands of new jobs that will help the country meet its growing energy needs while preserving the environment. With targeted policy support, we can help ensure that clean energy's economic and environmental benefits are enjoyed by all." (Souce: Energy Innovation an Economic Path Forward,Thorium MSR, By Christine Todd Whitman and Patrick Moore - 05/12/10 08:45 AM ET).  
Dr.A.Jagadeesh Nellore(AP),India

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