



ENERGY AND RESOURCES GROUP
310 BARROWS HALL
UNIVERSITY OF CALIFORNIA
BERKELEY, CA 94720-3050
WWW: <http://socrates.berkeley.edu/erg>
FAX: (510) 642-1085

DANIEL M. KAMMEN
PROFESSOR IN THE ENERGY AND RESOURCES GROUP
PROFESSOR OF PUBLIC POLICY IN THE GOLDMAN SCHOOL
PROFESSOR OF NUCLEAR ENGINEERING
DIRECTOR, RENEWABLE AND APPROPRIATE ENERGY LABORATORY
EMAIL: kammen@socrates.berkeley.edu
TEL: (510) 642-1139 (OFFICE)

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**COMMENTS BY PROFESSOR KAMMEN
ON STATE TREASURER ANGELIDES' *GREEN WAVE* INITIATIVE**

I am here today to congratulate Treasurer Angelides on the leadership that he has shown in moving California into the vanguard of investment in emerging technologies, companies, and practices that demonstrate the potential alliance, not opposition, of profitable *and* environmentally and socially sustainable business.

For too long innovations in solar, wind, and biomass/waste technologies, green buildings, highly efficient vehicles, and construction practices that minimize waste have languished in the market despite impressive technical advances, cost reductions, and great potential¹.

In 1999 former U. S. Department of Energy official Joe Romm published *Cool Companies*, a compendium of industry studies that demonstrated that with reasonable lead-time and proper motivation (such enforcement of the Clean Air Act) a wide range of companies could *cut their greenhouse gas emissions at a profit*. Until recently few states have taken up the challenge – namely providing the atmosphere that encourages clean and green innovation.

¹ Robert Margolis & Daniel Kammen “Underinvestment: The energy technology and R&D policy challenge”, *Science*, 285, 690 – 692 (1999). Access at <http://socrates.berkeley.edu/~rael/papers.html>

The *Green Wave* initiative provides the critically needed financial muscle and public sector support needed to create that environment of innovation and entrepreneurship which will foster the growth of a new – clean – economic sector for California.

Treasurer Angelides has noted the job creation potential of investments in solar energy technology, which on a per megawatt basis leads to an estimated 35 new jobs. In fact, investment in new renewable energy sources leads to roughly *ten times* more jobs than a comparable investment in the fossil-fuel sector. This difference underscores the economic benefits of moving our economy and society from one of energy ‘hunter gatherers’ (mainly gathering from the politically complicated Middle East, I might add), to one of ‘energy farmers’ and innovators¹.

None of this should come as a surprise, of course². The economic engine that is Silicon Valley was built on innovations in an emerging technology sector that three-decades ago was seen mainly by people in retrospect called ‘visionaries’. We are already seeing this growth elsewhere. In northern Germany wind turbines now provide on average 25% of electricity³. This has taken place in the region of the country with the fastest economic growth.

Renewable energy technology and efficient energy management is such an emerging sector, and one that we will look back on a decade from now and point -- somewhere -- to the ‘Silicon Valley’ of clean energy. It can and should be here in California where we already have an ideal natural and financial climate, the best energy researchers in the world, and where the state Renewable Energy Portfolio Standard (Senate Bill 1078)⁴ already calls for 1% annual growth in installed clean energy capacity⁵.

¹ Daniel Kammen, forthcoming *Energy Farmers: Technologies and Policies for a Sustainable Economy*

² Dan Jacobson and Daniel Kammen ‘What the Governor could do to prevent the next energy crisis’, *The San Francisco Chronicle*, OpEd, Friday, September 28, 2001.

³ The north German state of Schleswig-Holstein currently meets 25% of annual electricity demand with 2,400 wind turbines which have a total capacity of 1,800 MW. Schleswig-Holstein has committed to achieving 50% of electricity from wind by 2010, and is currently embarking on biomass and hydrogen energy programs as well (<http://landesregierung.schleswig-holstein.de>).

⁴ See: California Energy Commission Renewables Portfolio Standard <http://www.energy.ca.gov/portfolio/>

⁵ The Renewable Energy Portfolio Standard should only be seen as a beginning. Reduced interest rate mortgages for energy efficient homes, and low-cost loans for residential and commercial investments in clean energy, and a policy of energy supply diversity would all improve economic and environmental sustainability.

The *Green Wave* initiative can help make this happen.

Thank you Treasurer Angelides, and thank you to the entrepreneurs and public officials who are already supporting and moving into this important and very promising and sector.