From: Gil Masters (gmasters@stanford.edu)
To: energyfolks@lists.stanford.edu
Date: Fri, October 30, 2009 2:35:20 PM
Subject: Energyfolks: Bono, All renewables future, Lovins nukes, grids, jobs

Hi Energyfolks:

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Quotes for the Day:
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Bono's 3 Greatest Threats.... Bono, NYTimes ed 10-18-09

..The world sees that America might just hold the keys to solving the three greatest threats we face on this planet: extreme poverty, extreme ideology and extreme climate change. ...

Up to 400 gallons of gasoline to deliver 1 gallon to the battlefield:

..... The Commandant of the Marine Crops, General Conway said it best during the Marine Corps energy summit a few weeks ago when he described the fully burdened cost of a *gallon of gasoline* delivered to a piece of equipment in Afghanistan. It turns out that when you factor in the cost of transportation to a coastal facility in Pakistan – or airlifting it to Kandahar – and then you add the cost of putting it in a truck, guarding it, delivering it to the battlefield, and then transferring that one gallon into a piece of equipment that needs it – in extreme cases t*hat gallon of gasoline could cost up to $400*.

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INTERESTING NEWS ITEMS:
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1. "A Path to Sustainable Energy by 2030" Jacobson & Delucci, SciAm Nov 2009
2. Amory Lovins Takes on Stewart Brand Over Nukes
3. Installed Cost of Solar Photovoltaic Systems in the U.S. Fell in 2008: New LBNL Report
4. New Stanford Campus Energy Plan: $250 Million, 20% lower GHG by 2020.
5. NRC Report on Hidden Health Costs of Energy: 3.2¢/kWh for coal + climate damages
6. Project would link nation's 3 electric- power grids
7. DOE Releases New Versions of EnergyPlus and OpenStudio building energy software
8. Two California solar bills now law: Surplus PV and FIT
9. China to build Texas wind farm with Chinese turbines (Tom Friedman's warning coming true)

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LOCAL (STANFORD) DOINGS:
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1. Upcoming Energy Seminars (Community Invited)
2. Berkeley-Stanford Clean Tech Conference on Smart Grid, Nov 13

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JOBS JOBS JOBS

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1. Emerging Technology and Energy-Efficiency Consultant: Navigant, CA, MA and DC
2. Business Development, Onsite Energy: 3 Phases Renewables, Manhattan Beach, CA
3. Asst. Professor Energy and Public Policy, U of Michigan
4. Research Associate HVAC, Staff Scientist Windows/Facades: Lawrence Berkeley Natl Labs
5. Sustinability Analyst and Associate, GreenOrder, NY
6. Project Analyst, Wholesale Generation: Suntech
7. Building Energy Modeling, Caneta Energy, Mississauga, ON Canada

8. Cleantech Startup Rewards Households for Saving Energy: Volunteers Wanted
9. Project Engineer and Design Engineer, JUWI Solar, Boulder, CO
10. Research Scientist, Process Engineer, Research Analyst, Li-ion Batteries for EVs, Amprius, Menlo Park, CA
11. Business and Policy Development Assoc. Mgr, American Solar Electric, AZ
12. 1-yr MAP/Worldwatch Research Fellowship
13. Energy Codes & Standards Engineer/Advocate, High-Tech Sector, NRDC, SF
14. Energy Efficiency Analyst, OPOWER, DC
15. Clean Energy Program Manager, USAID, Asia.
16. Research Manager, Regulatory Assistance Project, Montpelier, VT
17. Energy-Efficiency Engineer, CLEAResult, TX
18. 2-Year Fellowship Program: Environment America
19. Faculty Position: International Energy and Environmental Policy, UT Austin

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INTERESTING NEWS ITEMS:
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1. "A Path to Sustainable Energy by 2030" Jacobson & Delucci, SciAm, Nov 2009

The cover story in the November, 2009, edition of Scientific American is "A Path to Sustainable Energy by 2030: Wind, water and solar technologies can provide 100 percent of the world's energy, eliminating all fossil fuels." Authored by Stanford's Mark Jacobson and U.C. Davis' Mark Delucci. Check it out !

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2. Amory Lovins Takes on Stewart Brand Over Nukes

Stewart Brand's new book, *Whole Earth Discipline: An Ecopragmatist Manifesto*, argues, among other things, that environmentalists should reconsider nuclear power. RMI's Chief Scientist Amory Lovins responds in Grist with a **thanks, but no thanks**.

Read more about how Lovins debunks the "Four Nuclear Myths."

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3. Installed Cost of Solar Photovoltaic Systems in the U.S. Fell in 2008: New LBNL Report

The new LBNL report: "Tracking the Sun II: The Installed Cost of Photovoltaics in the U.S. from 1998-2008" (Wiser, Barbose, Peterman, Darghouth) provides a comprehensive summary of installed cost trends for grid-connected solar photovoltaic (PV) systems in the United States from 1998 through 2008, updating an earlier report that contained data through 2007. The updated report is based on project-level data from more than 52,000 residential and non-residential PV systems, totaling 566 MW of capacity and representing 71% of all grid-connected PV capacity installed in the U.S. through 2008. These data were provided by 27 PV incentive programs spanning 16 states.

They find that average installed costs have declined over time, from $10.8/W in 1998 to $7.5/W in 2008 (in real 2008 dollars per installed watt DC). Importantly, average costs declined by approximately $0.3/W from 2007 to 2008, following several preceding years (2005-2007) when they remained essentially flat. The cost reductions from 2007 to 2008 were associated with a decline in module costs, in contrast to earlier years when cost reductions were associated primarily with a decline in non-module costs.

Costs are generally lower in states with larger PV deployment programs (though exceptions exist), and international experience suggests that greater near-term cost reductions are

possible, with Germany and Japan exhibiting significantly lower average installed costs for residential PV systems than the U.S. We also find evidence of sizable economies of scale among the PV systems in our sample, significant variation in average installed cost among states, and cost advantages for PV installed in residential new construction relative to the retrofit market. The report also describes trends in financial incentive levels over time, by customer type and among states, and the associated impact of these trends on the net installed cost of PV for residential and commercial PV system owners after receipt of incentives.

The report can be downloaded from:
http://eetd.lbl.gov/ea/emp/re-pubs.html

A PowerPoint presentation that summarizes key findings can be found at:
http://eetd.lbl.gov/ea/emp/emp-ppt.html

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4. New Stanford Campus Energy Plan: $250 Million, 20% lower GHG by 2020.

Initial phases of the plan rely on aggressive energy conservation as well as major changes to the campus heating and cooling scheme, including phasing out the campus "Cardinal Cogen" plant and replacing the underground steam lines with a hot water distribution loop. A careful study discovered that over half the university's heating demands could be met with heat that is already being removed from buildings by the campus cooling system. Such a reuse of energy would cut the amount of natural gas burned for heating purposes dramatically, reducing energy costs as well as emissions of greenhouse gases and water consumption by the existing cooling towers. The full plan is available Stanford Energy & Climate Plan, Oct 15, 2009.

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5. NRC Report on Hidden Health Costs of Energy: 3.2¢/kWh for coal + climate damages

A new report from the National Research Council examines and, when possible, estimates "hidden" costs of energy production and use -- such as the damage air pollution imposes on human health -- that are not reflected in market prices of coal, oil, other energy sources, or the electricity and gasoline produced from them. The report estimates dollar values for several major components of these costs. The damages the committee was able to quantify were an estimated $120 billion in the U.S. in 2005, a number that reflects primarily health damages from air pollution associated with electricity generation and motor vehicle transportation. The figure does not include damages from climate change, harm to ecosystems, effects of some air pollutants such as mercury, and risks to national security, which the report examines but does not monetize.

Coal accounts for about half the electricity produced in the U.S. In 2005 the total annual external damages from sulfur dioxide, nitrogen oxides, and particulate matter created by burning coal at 406 coal-fired power plants, which produce 95 percent of the nation's coal-generated electricity, were about $62 billion; these nonclimate damages average about 3.2 cents for every kilowatt-hour (kwh) of energy produced. A relatively small number of plants -- 10 percent of the total number -- accounted for 43 percent of the damages. By 2030, nonclimate damages are estimated to fall to 1.7 cents per kwh.

Coal-fired power plants are the single largest source of greenhouse gases in the U.S., emitting on average about a ton of CO2 per megawatt-hour of electricity produced, the report says. Climate-related monetary damages range from 0.1 cents to 10 cents per kilowatt-hour, based on previous modeling studies.

Copies of HIDDEN COSTS OF ENERGY: UNPRICED CONSEQUENCES OF ENERGY PRODUCTION AND USE are available from the National Academies Press; tel. 202-334-3313 or 1-800-624-6242 or on the Internet at HTTP://WWW.NAP.EDU. Reporters may obtain a copy from the Office of News and Public Information (contacts listed above).

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6. Project would link nation's 3 electric- power grids

A proposed super transmission station in New Mexico would tie together the nation's three electric- power grids. The hope is that it will help route energy from isolated wind and solar installations to places that consume the most power.

ALBUQUERQUE, N.M. — Heather Clark, AP: Officials announced an ambitious project in New Mexico on Tuesday that would allow energy to flow more freely across the nation's three massive power grids, breaking down significant barriers to ramping up alternative energy in the United States.

The proposed Tres Amigas SuperStation in Clovis, N.M., would help route energy from isolated wind and solar installations to urban centers and other places that consume the most power. The transmission hub would be located across 22 square miles in eastern New Mexico near the Texas border. Clovis was chosen because it is nearest to where the nation's three power grids — called the East, West and Texas interconnections — come closest together.

Tres Amigas would build a triangular pathway of underground superconductor pipelines, combined with AC/DC converters that synchronize the flow of power between the interconnections. Construction could begin in 2011 or 2012, and the hub could be running in 2013 or 2014, said Phil Harris, chief executive of the Santa Fe-based Tres Amigas.

The pipelines, 3 feet in diameter, contain hair-thin ceramic fibers developed by Devens, Mass.-based American Superconductor and can carry enough electricity to power 2.5 million homes.

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7. DOE Releases New Versions of EnergyPlus and OpenStudio building energy software:

Oct 26, 2009. The U.S. Department of Energy has released updated versions of its popular EnergyPlus simulation software for modeling heating, cooling, lighting, ventilating, and other building energy flows, as well as its OpenStudio plug-in for Google's SketchUp program. Available for Windows, Linux, and Macintosh operating systems, EnergyPlus 4.0 also includes two new application guides: "Energy Management System Application Guide" and "Using EnergyPlus for Compliance."

There is no charge to install and use EnergyPlus. Download EnergyPlus 4.0. The next version is scheduled for release in April 2010.

Key new features in OpenStudio include updates for EnergyPlus 4.0, improved parsing and caching of input and output files, support for HVAC templates, and SQLite output option. As with EnergyPlus, there is no charge to install and use this plug-in. Download OpenStudio.

EnergyPlus is a resource of the U.S. Department of Energy's Building Technologies Program. This stand-alone simulation software is just a part of DOE's mission to help our nation reach its energy efficiency and renewable energy goals. For more information, visit the Building Technologies Program Web site.

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8. Two California solar bills now law: Surplus PV and FIT

AB 920: Requires utility companies to pay customers for any surplus solar electricity generated, or allow them to roll credits over to the next year.

SB 32: Establishes a new "feed-in-tariff" program that requires utility companies to buy solar electricity at a set rate.

Solar users to feel surge in wallet

By Dana Hull dhull@mercurynews.com Updated: 10/13/2009 09:02:47 AM PDT

AB 920, authored by Assembly member Jared Huffman, D-San Rafael, requires utility companies to pay customers for any surplus electricity they produce from either solar or wind power. Under current net metering rules, utilities get to keep the additional electricity homeowners and businesses generate for the grid for free.

"It's an extra incentive to get folks in the game on small-scale solar and wind," said Huffman, a former attorney for the Natural Resources Defense Council. "Right now there's an incentive to waste. A lot of people who generate more electricity than they use become profligate energy wasters because they don't like the idea of giving their power back to the utility for free."

Currently, utilities give consumers a credit on their monthly bill that can be used to offset higher energy consumption at other

times of the year, like the darker winter months. But at the end of the year, any leftover credits are zeroed out. AB 920 requires utilities to allow the credit to be rolled over to the next year or pay consumers for it outright. The state Public Utilities Commission now must set the rate at which utility companies compensate solar and wind producers. The law goes into effect Jan. 1, 2011.

Senate Bill 32 creates an above-market tariff, called a "feed-in-tariff" program. Authored by Gloria Negrete McLeod, D-Chino, the bill will require the state's utilities to buy solar electricity from solar-panel generators of 1.5 to 3.0 megawatts in size at set rates above what utilities would pay for wholesale power from conventional sources.

"Every warehouse roof, every parking lot, every unused sunny space can now become a mini-power plant generating pollution-free solar electricity all while making money for the property owner," McLeod said in a statement.

Last month, Schwarzenegger directed the California Air Resources Board to increase California's Renewable Portfolio Standard so that 33 percent of the state's power will come from renewable sources by 2020. The governor in 2006 announced a "Million Solar Roofs" plan, a $3.3 billion incentive to get 1 million solar roofs in the Golden State by 2017.

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9. China-U.S. Group Plans to Build Texas Wind Farm October 29, 2009, NYtimes

A consortium of Chinese and American companies announced a joint venture on Thursday to build a 600-megawatt wind farm in West Texas, using turbines made in China.

Construction of the $1.5 billion wind farm will be financed largely by Chinese banks, with the help of loan guarantees and cash grants from the United States government.

The wind farm will be the first instance of a Chinese manufacturer exporting wind turbines to the United States, said Yang Yazhou, vice mayor of the city of Shenyang, where the wind turbines will be manufactured.

And: Is China Beating the U.S. in Clean Tech?
Technology Review

China has increased its investment in clean technology in recent years. According to a report released in August by The Climate Group, a nonprofit group based in London that supports clean technology development, "in an incredibly short space of time China has taken the lead in the race to develop and commercialize a range of low carbon technologies."
The report highlighted that China plans to produce half a million electric vehicles in 2011, and that it produces 30 percent of the world's solar panels and is the world's fourth-largest generator of wind power. A report from the British bank HSBC earlier this year noted that China's economic stimulus package invested $221 billion in technology for reducing greenhouse-gas emissions, about twice the amount invested in such technology through the U.S. economic stimulus package enacted earlier this year.

Still, China is hardly a model for addressing climate change. China recently became the world's largest producer of greenhouse-gas emissions (although the United States still leads on a per capita basis). A report from the International Energy Agency this month suggests that China's greenhouse-gas emissions will continue to increase rapidly, nearly doubling by 2030 without new, aggressive climate policies. Even with such policies, China's emissions are expected to increase in the next decades, though at a slower pace.

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LOCAL (STANFORD) DOINGS:
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1. Upcoming Energy Seminars (Community Invited)

November 4, 4:15-5:15, Building 420, Room 40
Lyndon Rive, Founder and CEO, Solar City
Residential and Commercial Solar: Installation Analysis and Financing Model

November 11, 4:15-5:15, Building 420, Room 40
Professor Michael McGehee, Director of the Center for Advanced Molecular Photovoltaics, Marterials Science and Engineering Department
Solar Cell Technology in 2009 and Beyond

November 18, 4:15-5:15, Building 420, Room 40, followed by a **MAP** Energy Social in Y2E2, Social Entry
John Benner, National Renewable Energy Laboratory, *Solar Energy at Scale: Materials, Environmental, and Energy Impact*

December 2, 4:15-5:15, Building 420, Room 40
Heidi Cullen, Climate Central, Director of Communications, Senior Research Scientist
Seeing Climate, Seeing Change: Communicating Climate Science in a Changing Media Landscape

Thank you to **Chevron** for sponsoring the Energy Seminar
Thank you to **MAP** for sponsoring the MAP Energy Social

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2. Berkeley-Stanford Clean Tech Conference on Smart Grid, Nov 13

Date: Friday, Nov 13th 2009
Location: Stanford Research Institute Audiotorium, 333 Ravenswood Avenue, Menlo Park, CA 94025-3493
Time: 12pm - 7pm

Registration is now open for the Berkeley-Stanford CleanTech Conference's fourth conference in our CleanTech Conference Series. "Smart Grid: Vision, Opportunity, and Effectiveness"

This fourth installment is made possible through a partnership with Stanford University's Energy Crossroads and sponsorship from the Electric Power Research Institute (EPRI) and Berkeley Columbia Executive MBA Program. This conference will cover the past, current and future state of the Smart Grid from technical, policy and business point of view. For participants, this is an excellent opportunity to network and learn about opportunities in this rapidly emerging field.

The conference will cover the following:

- What is the Smart Grid today? Where is it going?
- How can innovators make the most of Smart Grid opportunities?
- What policies will enable the Smart Grid? What are the constraints in the system?

You will get a chance to hear from distinguished speakers like Andrew Tang, Senior Director of Smart Energy Web at PG&E; Andrew Campbell, Senior Energy Advisor, California Public Utilities Commission; and Erfan Ibrahim, Technical Executive at the Electric Power Research Institute, among many others.

For more details please visit our website http://cleantech.stanford.edu/

We are also looking for volunteers to help with fund raising, marketing, day-of-event setup, etc. If you are interested, contact us at malaki@bscleantech.org.
REGISTRATION is currently open. Please register promptly to ensure your attendance as previous conferences have sold out.

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JOBS JOBS JOBS

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1. Emerging Technology and Energy-Efficiency Consultant: Navigant, CA, MA and DC

2. Business Development, Onsite Energy: 3 Phases Renewables, Manhattan Beach, CA
3. Asst. Professor Energy and Public Policy, U of Michigan
4. Research Associate HVAC, Staff Scientist Windows/Facades: Lawrence Berkeley Natl Labs
5. Sustinability Analyst and Associate, GreenOrder, NY
6. Project Analyst, Wholesale Generation: Suntech
7. Building Energy Modeling, Caneta Energy, Mississauga, ON Canada
8. Cleantech Startup Rewards Households for Saving Energy: Volunteers Wanted
9. Project Engineer and Design Engineer, JUWI Solar, Boulder, CO
10. Research Scientist, Process Engineer, Research Analyst, Li-ion Batteries for EVs, Amprius, Menlo Park, CA
11. Business and Policy Development Assoc. Mgr, American Solar Electric, AZ
12. 1-yr MAP/Worldwatch Research Fellowship
13. Energy Codes & Standards Engineer/Advocate, High-Tech Sector, NRDC, SF
14. Energy Efficiency Analyst, OPOWER, DC
15. Clean Energy Program Manager, USAID, Asia.
16. Research Manager, Regulatory Assistance Project, Montpelier, VT
17. Energy-Efficiency Engineer, CLEAResult, TX
18. 2-Year Fellowship Program: Environment America
19. Faculty Position: International Energy and Environmental Policy, UT Austin

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JOBS JOBS JOBS

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1. Emerging Technology and Energy-Efficiency Consultant: Navigant, CA, MA and DC

NAVIGANT CONSULTING, INC. (NYSE: NCI) is a specialized independent consulting firm providing dispute, financial, regulatory and operational advisory services to government agencies, legal counsel and large companies facing the challenges of uncertainty, risk, distress and significant change. We focus on industries undergoing substantial regulatory or structural change including healthcare, energy and financial and insurance services, and on the issues driving these transformations.

Position: Emerging Technology and Energy-Efficiency Consultant (Energy Practice)

Location: Burlington, MA, San Francisco, CA, and Washington, DC

Position Summary: The position, based in Burlington, MA, San Francisco, CA, and Washington, DC, is for a Consultant in the Emerging Technology and Energy-Efficiency group within NCI's Energy Practice. This is an entry level position for individuals with 0 - 2 years of post graduation professional experience. Emerging Technology and Energy-Efficiency Consultants are part of a team that assists leading energy-related organizations (including utilities, energy companies, government organizations and equipment suppliers) create innovation and exploit technology across the full spectrum of their activities, from setting strategy to developing and deploying cutting-edge products and applications.

The Emerging Technology and Energy-Efficiency Consultant will assist the team by:
- Assessing technologies and analyzing technology trends
- Modeling the cost and performance of advanced technologies
- Developing technology strategies for utilities, government, energy companies, and equipment suppliers
- Supporting the design and implementation of technology management processes (including portfolio management, technology sourcing, and R&D management)
- Building new technology deployment and commercialization strategies
- Communicating solutions and new strategies to clients through technical reports and presentations

Basic Qualifications:
- BS or MS degree in an engineering or science discipline

- Strong interest in one or more of the following areas: energy efficiency, renewable energy, advanced technologies, residential and commercial building energy use, distributed generation, and electricity transmission and distribution.
- Outstanding analytical and problem-solving skills
- Strong verbal and written communication skills
- High degree of self-confidence and determination
- Highly developed organization and management skills
- Ability to manage multiple time-sensitive priorities without diminished effectiveness
- Demonstrated proficiency with spreadsheets, databases, word processing, and slide presentation software
- Experience developing and using analytical models and simulations
- Ability to travel and work overtime hours as needed

To apply: Please go to www.navigantconsulting.com/careers and submit your resume to one of the postings that can be accessed through the Campus portal: Burlington (req. 1903); San Francisco (req. 1904); and Washington DC (req. 1906). The deadline for submission is October 30, 2009.
EOE M/F/D/V
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2. Business Development, Onsite Energy: 3 Phases Renewables, Manhattan Beach, CA

3 Phases Renewables, as a renewable energy developer and Energy Service Provider, is focused on procuring and selling green energy within the Western U.S. We are currently responding to a growing market demand for green energy and are looking to fill the position of Business Development, Onsite Energy. We are seeking a motivated, creative, and entrepreneurial individual to execute on all this position has to offer in a small, growing company.

This full time position requires an entrepreneur who is willing and able to build and grow new business with our company. Because we are uniquely positioned in the energy industry, this is a very attractive career opportunity. If you thrive in a high-energy environment where ideas are encouraged, creativity is rewarded, and the potential is unlimited, please contact us.

- Provide analysis of solar development projects using financial modeling techniques
- Lead sales efforts of onsite renewable generation
- Identify attractive generation projects, both through relationships and RFP responses
- Identify market positioning and gather market data
- Analyze and evaluate the effectiveness of sales, methods, costs and results
- Provide recommendations for company growth opportunities
- Assist with regulatory reporting and compliance
- Provide sales and marketing support for 3 Phases Renewables' other business divisions

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- Leadership skills and ability to develop new business in a growing renewable energy company
- Finance experience complimented with marketing, sales and/or business development experience
- Strong background in Project Finance
- Outstanding interpersonal skills
- Experience in market segmentation and differentiation
- Creativity in marketing solutions to develop market awareness and strategic positioning
- Renewable energy industry experience with a knowledge and understanding of energy markets
- Business degree required

Job Location: Manhattan Beach, California

If you are interested and qualify, please send a resume to: info@3PhasesRenewables.com

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3. Asst. Professor Energy and Public Policy, U of Michigan

The Gerald R. Ford School of Public Policy at the
University of Michigan invites applications from well-qualified individuals

for a tenure-track assistant professor position in public policy. The position will have a university year appointment. Successful candidates must demonstrate outstanding research potential; willingness to teach core and applied undergraduate, Masters and Ph.D. level courses in an interdisciplinary public policy program; ability to mentor Masters and Ph.D. students; and interest in interacting with students, faculty, and policy practitioners in an interdisciplinary professional school environment.

The position is open with respect to disciplinary background. We seek applications from candidates whose research and teaching interests focus on public policy aspects of the production, distribution, consumption and availability of energy - domestic and international.

Please send application materials, including a CV, writing samples, 3 letters of reference, and teaching evaluations (if available) to: Energy and Public Policy Search, Gerald R. Ford School of Public Policy, 735 S. State St., University of Michigan, Ann Arbor, MI 48109. Review of applications will begin on October 31, 2009 and continue until a suitable candidate is identified. The University of Michigan is an Equal Opportunity, Affirmative Action employer. Women and minorities are encouraged to apply, and the University is supportive of the needs of dual career couples.

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4. Research Associate HVAC, Staff Scientist Windows/Facades: Lawrence Berkeley Natl Labs

Lawrence Berkeley National Laboratory has a new opening in the Simulation Research Group for a Scientific Engineering Associate. The main duties will include further development of EnergyPlus, particularly its modeling of HVAC systems.

Details are posted at: http://jobs.lbl.gov/LBNLCareers/details.asp?jid=23496&p=1

For an informal discussion about the opening, call Fred Buhl (510 486 4912) or Philip Haves (510 486 6512).

There is also an opening for a Windows/Facades Analyst/Modeler at the Scientist or Staff Scientist level. This is a joint position in the Windows and Daylighting Group and the Simulation Research Group.

Details are posted at: http://jobs.lbl.gov/LBNLCareers/details.asp?jid=22585&p=1

For an informal discussion about the opening, call Steve Selkowitz (510 486 5064) or Philip Haves (510 486 6512).

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5. Sustinability Analyst and Associate, GreenOrder, NY

GreenOrder is hiring at both the Analyst and Associate levels for our New York Office. For full job postings, see out website: http://greenorder.com/?ID=Careers

GreenOrder (www.greenorder.com) is a strategy and management consulting firm that helps companies maximize the value of sustainability – making environmental excellence, energy innovation, and corporate responsibility drivers of profitable growth. We are a wholly owned subsidiary of LRN (www.lrn.com), working to help build sustainable organizations that outbehave – and outgreen – the competition.

Founded in 2000 and headquartered in New York City, with offices in San Francisco and Washington, DC, we combine world-class strategy, rigorous factual analysis, and effective messaging to help some of the world's largest enterprises turn their investments in sustainability into concrete competitive advantage.

ASSOCIATE
GreenOrder is seeking to hire an Associate to manage consulting engagements and deliver world-class advice to our clients. The ideal candidate will have an undergraduate education in environmental studies (science, policy, engineering), an MBA from a top-tier school, and an outstanding record of academic and professional success. Work experience at a top-tier management consulting firm is strongly preferred.

- To apply for the Associate position, send resume and cover letter to: Associate@greenorderjobs.com. (No phone calls please)

ANALYST
GreenOrder is seeking to hire an Analyst who is a recent college graduate in science or engineering or has a liberal arts background and deep knowledge of environmental issues. All candidates should have a strong interest in business consulting.

1-2 year work experience, either in a corporate setting such as a top-tier consulting firm or investment bank, or a leading environmental NGO is preferred but not required. We are seeking an individual with intellectual rigor, analytical thinking, creativity, and a passion for delivering outstanding, game-changing solutions to clients.

We are seeking an Analyst who can interact directly with clients, be a self-starter, and otherwise contribute to the team. The Analyst will have exposure to the business challenges we address for our clients and the opportunity to contribute directly to the solutions we develop.

- Education: An undergraduate degree from a top-tier college and a strong record of academic and professional success is required. Desired backgrounds include sciences and engineering, with additional coursework in environmental and energy issues as well as business and economics. Liberal arts graduates with strong domain knowledge should also consider applying.
- Professional Experience: 1-2 years of experience at a top-tier management consulting firm or investment bank, or with a leading environmental NGO is preferred. Other experience at the intersection of business and the environment is desirable.
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To apply for the Analyst position, send resume (including GPA) and cover letter to: Analyst@greenorderjobs.com (No phone calls please)

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6. Project Analyst, Wholesale Generation: Suntech

We're seeking an experienced Project Analyst to help implement strategies necessary to develop utility-scale, Wholesale Generation solar PV projects. The Project Analyst is responsible for working with senior sales managers and executives to formulate proposals, perform a variety of analysis functions, and assist in developing projects with select industry partners. We are looking for a team player with proven ability to achieve results in a fast moving, dynamic environment. The candidate should be self-motivated and self-directed.

Minimum requirements:
-BS in engineering, economics, or other quantitative discipline from a top institution; MBA or other advanced degree welcome
-Three to five years in the energy or related industry, preferably in energy project economic analysis

Please send a brief cover letter and resume to hr@suntechamerica.com

More information: www.suntech-power.com

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7. Building Energy Modeling, Caneta Energy, Mississauga, ON Canada

Caneta Energy has an immediate need for an intermediate mechanical engineer (BaSc or MaSC) with three to five years EE4, DOE 2.1E,eQuest energy modelling experience. Ideally, the candidate has a keen interest in applying his or her simulation skills to cutting edge energy modelling associated with building energy target guarantees.

Caneta Research Inc. is a growing engineering company in Mississauga providing technology investigation, engineering analysis, energy analysis, computer programming, performance monitoring and management services to industry associations, governments, utilities and the private sector. Caneta Energy (a division of Caneta Research) provides energy efficiency consulting and modelling services in large buildings to its clients.

Specific duties of the position may include:

-Preparation of building energy simulation files and undertaking energy analysis using EE4 and DOE 2.1 E work-arounds for energy target projects.
-Participation in pursuit team meetings where energy modelling matters are discussed at the proposal stage, during early design development.
-Preparation of "for construction", "as built" and "calibrated" models on projects with energy use guarantees.

Good writing skills are essential. Salary is competitive and based on years of energy modelling experience.

Interested candidates should e-mail their resumes to dcane@canetaenergy.com. See more about Caneta at www.canetaenergy.com.

Brian Crossman

CANETA Energy
A Division of Caneta Research Inc.

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8. Cleantech Startup Rewards Households for Saving Energy: Volunteers Wanted

Earth Aid (www.earthaid.net) has developed the first free service that enables individuals to track their electric, gas, and water usage in one place online, receive customized tips to help them save, and earn rewards if they do save -- points that they can redeem for discounts at local businesses. This fall, we are launching a University Organizing Fellowship to empower students to work on the front lines in the fight against climate change in their communities, track their actual impact, and in the process, receive training on a variety of topics, from community organizing to political outreach and more. For students interested in energy and environmental issues, Earth Aid's cutting-edge technology, vision of sustainability, and commitment to metrics-based organizing will provide a valuable and rewarding experience. Email Letitia at lletitia@stanford.edu, Marcus at marcush1@stanford.edu or Bjorn at bjorn8r@stanford.edu with any questions.

> We're looking for volunteers: simply sign up for our mailing list by clicking: http://groups.google.com/group/earth-aid-bay/sub?s=B7QSiQwAAABoNW6_I6-cbQMTrT8yKg7r&hl=en
> We'll keep you posted so you can join us when we go canvassing or talking to local business / community leaders about Earth Aid!

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9. Project Engineer and Design Engineer, JUWI Solar, Boulder, CO

Project Engineer
juwi solar Inc. (JSI) based in Boulder, Colorado, and majority-owned by juwi Holding AG is a developer and turnkey installer of
solar power plants throughout North America. JSI's main focus is the development, construction and operation of utility scale power plants (1MW or larger). For further information please see www.juwisolar.com.

JSI has established an aggressive target for bringing solar power on line each year, and JSI is looking to fill the position of Project
Engineer. The Project Engineer will be responsible for working with the business development and construction groups to assure
that projects are completed in an accurate, timely and cost effective manner.

• ME/MS degree;
• A minimum of four years of work experience;
• Skilled in MS Excel, PowerPoint, Word and Project;
• Analytical Skills for problem solving;
• Excellent writing and oral communication skills;
• Ability to travel and willingness to work flexible and long hours; and
• Desire to grow professionally.
If interested, please send cover letter and resume to employment@juwisolar.com

Design Engineer. The Design Engineer will be responsible for collection, compilation, analysis and design of electrical, civil and structural components of solar projects.

Position Requirements:
• BS/BE with strong knowledge of electrical systems
• Skilled in MS Excel, PowerPoint Word and Project a plus;
• Skilled in AutoCad;
• Comprehension of engineering fundamentals in civil, electrical and structural systems;

This position is for a full-time opportunity, however, summer internships for strong candidates will be considered.
If interested, please send cover letter and resume to employment@juwisolar.com

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10. Research Scientist, Process Engineer, Research Analyst, Li-ion Batteries for EVs, Amprius, Menlo Park, CA

Amprius is looking for creative, inquisitive, and highly motivated individuals to join our nano-materials development group. We are located in Menlo Park, California; near Stanford University, in the heart of Silicon Valley. We are backed by two top-tier venture capital firms.

Amprius' mission is to enable a new generation of electric vehicles by radically improving the energy density of Li-ion cells. We feel strongly that the $/Wh metric of Li-ion batteries is the biggest barrier holding back electric vehicles today. If you're passionate about that mission and are willing to step up to the challenge, we'd like to hear from you.

Research Scientist: Conduct research on nano-materials synthesis and characterization

- Ph.D. in Materials Science, Chemistry, Chemical Engineering or Applied Physics with an emphasis in nano scale materials synthesis and characterization
- 5-10 years of experience with Si deposition techniques including thermal evaporation, CVD and PECVD, etc.
- Familiar with silicon/metal interaction at atomic and nanoscale

Process Engineer Design experiments and analyze results for process optimization

- BS or MS in Materials Science or Chemical Engineering
- At least 7 years experience with Si deposition process development and quality control
- Experience
- Designed or modified CVD tools including PECVD
- Worked in large semiconductor or photovoltaic companies using these techniques

Research Analyst: Perform nano-scale materials characterization

- Operate laboratory process equipment
- Design experiments to investigate nano-materials synthesis
- BS in Materials Science, Chemistry, Chemical Engineering or Applied Physics with preferably an emphasis in nano scale materials synthesis and characterization
- 2-3 years of experience with Si deposition techniques including thermal evaporation, CVD and PECVD, etc.
- Experience in materials characterization techniques a plus, e.g. SEM, TEM, XRD

Will DelHagen
will@amprius.com
415-680-4700

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11. Business and Policy Development Assoc. Mgr, American Solar Electric, AZ

Business and Policy Development Associate Manager:

American Solar Electric, a solar photovoltaic installation company headquartered in one of Arizona State University's buildings in Scottsdale, AZ.

American Solar Electric is very active in
the Arizona policy arena.

The job description can be found here:

http://www.americanpv.com/pdf/news/Business%20and%20Policy%20Development%20Associate%20Manager.pdf

Interested applicants should submit a cover letter and resume to Tom Alston:

Tom Alston
Manager, Business & Policy Development
American Solar Electric, Inc.

1475 N. Scottsdale Road, Suite 410 | Scottsdale, Arizona 85257
Direct: 480-941-7433 | Cell: 480-254-9312 | Fax: 480-994-1438
Tom.alston@americanpv.com | www.americanpv.com
AZ ROC License #168657 [K-11], #236520 [K-42]

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12. 1-yr MAP/Worldwatch Research Fellowship

The Worldwatch Institute seeks a motivated, energetic and highly organized MAP Fellow to assist in a new Natural Gas and Sustainable Energy Initiative. Worldwatch is an independent environmental research organization that has, since 1974, provided accessible, fact-based analysis of critical global issues. The one-year MAP Fellowship is based at the Worldwatch office in Washington, D.C. The position entails research and writing on an extensive range of environmental, economic and community-based impacts regarding the use of natural gas and its role as a complimentary strategy to renewable and efficiency. The ideal candidate is a Stanford undergraduate student with at least 1-2 years work experience, a Stanford graduate student or a recent Stanford graduate. Full project and job descriptions are available at http://www.maproyalty.com/fellowships.html.

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13. Energy Codes & Standards Engineer/Advocate, High-Tech Sector, NRDC, SF

NRDC's Energy Program focuses specifically on curbing global warming by advancing sustainable energy solutions such as energy efficiency, location efficiency, renewable energy, cleaner vehicles, and renewable fuels. The San Francisco Energy Codes and Standards Engineer/Advocate would be an integral part of the California Energy Program team, working to promote effective policies to reduce the greenhouse gas emissions and health related air pollutants emitted as a result of building sector development, in a manner that provides other economic and environmental benefits nationally and globally. This position will focus on increasing the efficiency of consumer and office electronics products, the fastest growing source of electricity use in the home. The new hire will bring highly specialized technical expertise to NRDC and the greater efficiency community.

In support of our goal of accelerating the adoption of energy efficient products, we pursue both voluntary and mandatory policies and work with a wide range of stakeholders including retailers, manufacturers, component makers, researchers, and policy makers. Policy forums in which we participate most actively include state and national-level efforts in the U.S., China, and at the European Union.

This position represents a challenging, entrepreneurial, and enjoyable opportunity for the right person.

Responsibilities:
The Engineer/Advocate will represent NRDC in efforts to:

- Establish up to date test methods for measuring power use of specific products (i.e. computers, TVs, home network equipment, etc.);
- Collect and analyze data on the energy use of various products;
- Participate in various forums where efficiency levels for efficient models are established including ENERGY STAR, utility rebate programs, industry led initiatives such as the Green Grid, and mandatory standards (also known as MEPS – minimum efficiency performance standards);
- Perform outreach to potential allies such as manufacturers, retailers, utilities, and other stakeholders to gather support for our positions and policies;
- Support R&D to develop the next generation of more efficient designs and products; and,
- Work with key policy makers and trade associations around the world to develop and implement effective verification testing and enforcement.

Skills and Expertise Requirements:
This position requires a thorough understanding of consumer electronics and office equipment products, particularly with respect to energy consumption and efficiency, and the ability to learn about the technical basis of a range of energy-consuming products. While this position will focus on mandatory measures such as codes and standards, these must be developed in a policy context that includes other mechanisms such as financial incentives, labels, recognition programs, bulk procurement, etc.

This position not only requires a solid technical background but also the ability to be a successful policy advocate. The following skills and experiences will be helpful to the successful candidate:

- Graduate or professional degree in computer science, electrical engineering or other related discipline.
- Three to ten years of relevant work experience.
- Familiarity with test protocols and standards for consumer electronic and office equipment products.
- Persuasive oral and written advocacy skills.
- Ability to build and work with coalitions.
- Strong quantitative and analytic capabilities.
- Knowledge of how business operates when confronted with requirements for meeting environmental standards such as energy efficiency.

We offer competitive salaries, excellent benefits, and a pleasant working environment and are committed to workplace diversity. Salary is based on a nonprofit scale and commensurate with experience. Applicants should send a resume, writing sample, and cover letter with salary requirements to earevalo@nrdc.org. Please state your name and the position title in the subject of the email. No phone calls or faxes, please.

The deadline to apply is December 15, 2009.. NRDC is an Equal Opportunity Employer.

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14. Energy Efficiency Analyst, OPOWER, DC

OPOWER is a startup in Washington DC that uses behavioral science research and helps utilities get their customers to consume less energy. We've grown from having 3 utility clients in January to having nearly 20 clients now. We're hiring for many positions, but I wanted to paste one in particular below. This would be an ideal position for someone with a BA or BS and a few years of work experience with a degree in ENVR/ENST or at least releated coursework.

Please contact me if you are interested in the position. Also there are about 20 other jobs on the site. Take a look at http://opower.hrmdirect.com/employment/openings.php?sort=da& if you're interested.

Thanks,
Alex Doyne
amdoyne@gmail.com

Energy Efficiency Analyst

Department: Product Management
Office: Headquarters (Arlington, VA)
Location:Arlington, VA

Business Week named OPOWER, one of the Top 50 Tech start-ups to know about. Our company continues to expand and we are adding an Energy Efficiency Analyst to our Consumer Content team.

As an Energy Efficiency Analyst, you will collaborate with the Manager of Consumer Content to innovate on what content we deliver to consumers, how best to present it within our products and how best to serve our clients. This is an ideal job for an early career analyst, who is looking to leverage existing research, analysis and writing experience and to take on significant ownership and responsibility in a rapidly growing startup. This opportunity will create immediate impact on our Home Energy Reports.

Responsibilities

- Serve as a key internal expert on energy efficiency tips and concepts, fielding questions and conducting research on energy efficiency topics as necessary.
- Develop and target energy efficiency advice for our report and website products, including customizing our content for our clients; researching and writing energy efficiency tips; and calculating the costs, savings and other quantitative metrics associated with tips.
- Load, organize and manage content within our content repository tools, and test the content in our products. This work will require light coding (e.g. html). No prior experience required, however interest in mastering our web-based content management tool is important.
- Support the Manager of Consumer Content in managing client relations on content, including preparing meeting materials and client deliverables. Over time, a strong performer will have the opportunity to build direct relationships with certain clients.
- Help track key performance metrics on content and support research and analysis to improve content and targeting.

About you

- You have a Bachelor's Degree and 1-3 years of professional experience
- You are good with numbers and words, with a solid academic career in both.
- You are consumer-minded and love thinking about what resonates best with consumers.

About the Company

Founded in June 2007, OPOWER creates innovative software products that promote energy efficiency by empowering residential consumers to make better decisions on their energy usage. Through a platform which delivers home energy reports, robust online tools, insights based on data analytics, and customer service tools, OPOWER is reshaping the outlook on home energy demand and achieving unprecedented energy savings across hundreds of thousands of households. The company is well funded and making big headlines as they stay on track to saving enough energy to power a city of 75,000 homes and to reaching one million households by the end of 2009.

Please email your resume in MS Word, RTF, HTML, or ASCII text format to the address below. If you wish to enclose a cover letter, please include it in the body of your email message.

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15. Clean Energy Program Manager, USAID, Asia.

The USAID-funded ECO-Asia Clean Development and Climate Program (ECO-Asia CDCP) seeks an experienced expert to provide managerial and technical leadership in its efforts to promote the scale-up of clean energy policies, programs, and investment in the Asia region. The Deputy Chief of Party will be based in Bangkok and will assist with program management and technical implementation throughout the region. A job description is attached to this message.

With best regards,

Peter du Pont, Ph.D.
Chief of Party, ECO-Asia Clean Development and Climate Program
USAID Contractor, International Resources Group (IRG), an L-3 Company
Thailand and outside US: +66 81 700 2860
In US: +1 202 657 4942
peter@cleanenergyasia.net
www.cleanenergyasia.net
www.irgltd.com

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16. Research Manager, Regulatory Assistance Project, Montpelier, VT

The Regulatory Assistance Project (RAP) is a non-profit organization whose mission is to help policy-makers and regulators develop and implement policies that will improve the environmental sustainability and economic efficiency of the electric sector (www.raponline.org). RAP is headed by five Principals – all veteran utility regulators who advise policymakers on critical issues such as energy efficiency, power sector reform, renewable resource development, the regulation of greenhouse gas emissions, the establishment of efficient markets, performance-based ratemaking and other regulatory reforms, resource planning and portfolio management, and the nexus of environmental and energy regulation. Formed in 1992, RAP is an international leader that has worked with public utility regulators and energy and environmental officials across the U.S. and Europe, China, Brazil, India, Namibia, Egypt, and a host of other countries.

Current changes and growth in the electric utility sector are driving increased demand for RAP's services in the U.S. and abroad. In addition, RAP has recently formed a partnership with the ClimateWorks Foundation (www.climateworks.org), a new global philanthropic network dedicated to winning the battle against climate change. RAP will serve as ClimateWorks' Best Practice Network (BPN) for the public utility and electric power sector. RAP is expanding to meet the demands of this exciting new opportunity.

Research Manager
RAP seeks an experienced manager and researcher to fill the key role of Research Manager for this quickly growing organization. The Research Manager will work closely with the RAP Principals to determine and implement organizational research priorities, with the help of our experienced team of Research and Policy Analysts. The Research Manager will oversee research at RAP and, with web and publication support from the Communications Division, information management. The Research Manager will be responsible for ensuring that RAP's programmatic work and policy recommendations are grounded in rigorous research and quantitative analysis. The ideal candidate will be an experienced team leader, knowledge manager, and communicator, with experience managing people, complex information, and research for a growing, global organization. The Research Manager will report to the COO and/or one of the RAP Principals.

The successful applicant will have the following minimum qualifications:

- Bachelor's degree required (preferably in a quantitatively rigorous field). Master's degree or PhD preferred.
- 7+ years experience in a research role, with 3+ years in a research management role.
- Experience managing and supervising a team. Management of remote or international teams is a plus.
- Strong understanding of current energy and environmental policy issues. Familiarity with non-US markets is a plus.
- Deep experience successfully leading technically and analytically complex research projects.

To Apply
Interested candidates should follow the link below to submit a resume, cover letter, and salary requirements:
http://www.ceaconsulting.com/what/position_details.aspx?client=CEA&jobId=56
If you have questions, please contact Amy Dickie (Stanford BA 1999): amy@ceaconsulting.com

Amy Dickie I Associate
California Environmental Associates
423 Washington Street, 3rd Floor
San Francisco, CA 94111
T: (415) 421-4213 x 21
F: (415) 982-7989
www.ceaconsulting.com

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17. Energy-Efficiency Engineer, CLEAResult, TX

I'm a recruiter with CLEAResult Consulting (www.clearesult.com), an energy-efficiency consulting firm. CLEAResult works with utilities to design and implement energy-efficiency and peak-reduction programs.

I thought I'd reach out to you and see if you might know of anyone who might be interested in hearing about Energy-Efficiency Engineer openings that we have at CLEAResult in Texas(Austin, Houston, and Texarkana) and Oklahoma (Tulsa). We do offer relocation assistance. We're looking for folks who have experience in energy use analysis and energy auditing. These are senior- and mid-level openings.

Would you possibly know of anyone who might be interested in hearing about these opportunities?

James Hatheway - Contract Recruiter
CLEAResult Consulting, Inc.
jameshatheway@jhrecruiting.com
Office: 512.259.2383
Cell: 512.586.1573
www.clearesult.com
http://www.linkedin.com/in/hathewayjames

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18. 2-Year Fellowship Program: Environment America

Environment America offers a two-year Fellowship Program to help such students launch their careers. We're hoping that you can help us reach interested students to let them know about our program.

Environment America's mission is to research and advocate the policies and build and mobilize the public support necessary to win positive change for our environment. We have more than 100 professional staff working with the state-based groups in our national federation and in our Washington, D.C., office. We've organized 1 million members, activists and political allies to join us, winning changes that mean more solar and wind power, less global warming pollution, and more protections for our parks, waterways, forests and wilderness areas.

As you can imagine, we still have much more to do. We need to do more to document the problems, advocate the right policies, educate the public, mobilize more people to take action, build broader and stronger coalitions, and train and develop more organizers, advocates and other leaders to keep building the kind of support that can sweep past even the most powerful opposition. That's why we're hiring for our Fellowship Program.

The people accepted into our program are given the training, direction and experience they need to make an impact on environmental policy decisions, on issues from clean energy and climate change to clean water and wilderness preservation. Environment America fellows get trained to conduct research on environmental problems and policy solutions, lobby public officials, carry out effective media outreach campaigns, organize broad-based coalitions, and mobilize grassroots support and action.

After the two-year paid program, many of our fellows accept positions of greater responsibility within our own network or in other organizations, including the Sierra Club, the League of Conservation Voters, Greenpeace, the Natural Resources Defense Council and many others.

For more information about our Fellowship Program, interested students can contact us at Jobs@EnvironmentAmerica.org <mailto:Jobs@EnvironmentAmerica.org> or (202) 683-1250, and can learn more or apply online at www.EnvironmentAmerica.org/Jobs <http://www.environmentamerica.org/Jobs> .

To learn more about Environment America and to get involved in our campaign work, we invite you to check out our website at www.EnvironmentAmerica.org<http://www.environmentamerica.org/> or to give one of us a call at the number above.

Maria Schweitzer
Recruitment Director

Meg Doherty
Recruitment Administrator

P.S. We also have internships available for undergraduate students. Students can apply for internships online at www.EnvironmentAmerica.org/Jobs<http://www.environmentamerica.org/Jobs> .

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19. Faculty Position: International Energy and Environmental Policy, UT Austin

The Center for International Energy and Environmental Policy (CIEEP) of The University of Texas at Austin is seeking

candidates for a tenure-track faculty position to be based in the LBJ School of Public Affairs, Jackson School of Geosciences, or the Cockrell School of Engineering, who will conduct policy relevant research through CIEEP. The person in this position will teach and carry out other normal faculty responsibilities in the home department. The general areas of interest are energy systems economics or modeling, energy policy, geoscience aspects of energy and environmental resource systems, water resources, and energy conversion and storage. It is anticipated that the position will be filled at the assistant professor level; however, candidates seeking a more senior position will be considered. The position is available at the beginning of the fall semester 2010. Review of applications will begin October 12, 2009, but will be considered until the position is filled. Qualifications must be commensurate with rank and a Ph.D is required. Candidates should have potential for excellence in research and teaching at both the graduate and undergraduate levels and demonstrate excellent communication skills. Prospective candidates should send a letter of application including professional achievements and a clear statement of the policy-relevant research they have conducted and would plan to conduct in the future, a resume, and the names and contact information for four people willing to serve as references to: Ms. Dorothy Gillette, Center for International Energy and Environmental Policy, The University of Texas at Austin, 1 University Station C1100, Austin, TX 78712-0254
or dgillette@jsg.utexas.edu..

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From: Gil Masters (gmasters@stanford.edu)
To: energyfolks@lists.stanford.edu
Date: Fri, October 30, 2009 10:29:14 PM
Subject: Energyfolks: oops

Hello Energyfolks..

Oops... In the blurb I just sent I messed up the characterization of General Conway's remarks about how much fuel it takes to deliver a gallon of fuel to the battlefield.

He did not say it takes 400 gallons to deliver a gallon (which was my headline). He did say " ...in extreme cases that gallon of gasoline could cost up to $400" (as the quote in my blurb said).

Sorry about that.

Actually the October 14th speech from which I lifted the quote, delivered by the Secretary of the Navy, Ray Naburs, is really well worth a read. Here are a few more quotes from that speech, and the entire speech is attached.

(Portions of the) Remarks by the Honorable Ray Mabus
Secretary of the Navy
Naval Energy Forum
Hilton McLean Tysons Corner
McLean, Virginia
Wednesday, October 14, 2009

"I'm going to announce five energy targets today that the department will meet over the course of the next decade.

First: we are going to change the way the Navy and Marine Corps awards contracts. The lifetime energy cost of a building or a system, and the fully burdened cost of fuel in powering those, will be a mandatory evaluation factor used when awarding contracts. We are going to hold industry contractually accountable for meeting energy targets and system efficiency requirements. And we're going to do more. We will also use the overall energy efficiency and the energy footprint of a competing company as an additional factor in acquisition decisions. We want industry to partner with us and take steps not just to provide us with more energy efficient products, but to produce those products in energy efficient ways.

Second: The Navy will demonstrate in local operations by 2012 a Green Strike Group composed of nuclear vessels and ships powered by biofuel. And by 2016, we will sail that Strike Group as a Great Green Fleet composed of nuclear ships, surface combatants equipped with hybrid electric alternative power systems running biofuel, and aircraft flying only biofuels – and we will deploy it.

Third: the Department of the Navy will by 2015 reduce petroleum use in our 50,000 strong commercial fleet in half - by 50 percent. We'll do this by replacing our current fleet, as they go out of service, with a new composite fleet of flex fuel vehicles, hybrid electric vehicles, and neighborhood electric vehicles. Moving to biofuels and electric vehicles will benefit the local communities where our bases are located and will spur adoption of similar vehicles in those neighborhoods.

Fourth: the Department of the Navy will by 2020 produce at least half of our shore-based energy requirements on our installations from alternative sources. We will boost our usage of renewable energy and in some cases we will supply power to the grid from solar, wind, ocean, or geothermal sources generated by the base. We're already doing this at China Lake, where our on-base systems generate 20 times the load of the base.

Lastly, and maybe most importantly, I am asking all of us to meet a very ambitious goal. Today, about 17 percent of our total energy consumption comes from alternative sources. By 2020, half of our total energy consumption for ships, aircraft, tanks, vehicles, and shore installations will come from alternative sources. Right now I'm told 40 percent is a more realistic goal and even that remains difficult because of the cost and logistics. "

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Remarks by the Honorable Ray Mabus
Secretary of the Navy
Naval Energy Forum
Hilton McLean Tysons Corner
McLean, Virginia
Wednesday, October 14, 2009

Admiral Carr, thank you for your introduction and thank you all for being here. General Williams, Admiral Loose, our energy partners from the Navy, Marine Corps, academia, industry, and the media, I am honored to be with you. Energy reform is one of three areas – along with acquisition reform and unmanned systems – where I have focused and will continue to focus my attention during my tenure as Secretary of the Navy. Changing the way we do business, looking to an energy-secure Navy and Marine Corps of the future, and leading the federal government in energy initiatives is what we must do. Energy reform is a strategic imperative.

The stakes are high. As a nation and as a Navy and Marine Corps we simply rely too much on a finite and depleting stock of fossil fuels that will most likely continue to rise in cost over the next decades. You know the statistics better than I do:

- The United States consumes 25 percent of the world's oil but controls the production of only 3 percent.

- National governments or state-run oil companies control 77 percent of world production and 16 of the top 25 oil companies are state-run.

- Over 20 percent of the world's oil transits the Strait of Hormuz and 3.3 million barrels a day go through the Gulf of Aden.

- And oil, just last year, approached $150 a barrel.

We know oil is a limited resource. We buy from volatile areas of the world. Over time, the price keeps going up. The use of oil creates harmful environmental effects. And to a certain extent we have ceded a strategic resource – one that is difficult to guarantee – to other nations. We have ceded this to other nations who are allowed to exert disproportionate influence as a result. This creates an obvious vulnerability to our energy security, and to our national security, and to our future on this planet.

Moving from strategic to operational and tactical concerns, fossil fuel consumption has a deep impact upon our forces and our force structure, both in terms of the resources required to get fuel and to move it to the ships, tanks, aircraft, and equipment that need it, and in the Sailors and Marines whose duty it is to protect the ships or convoys moving the gas. We do not have operational independence and we are tied to a vulnerable logistics tail. The Commandant of the Marine Crops, General Conway said it best during the Marine Corps energy summit a few weeks ago when he described the fully burdened cost of a gallon of gasoline delivered to a piece of equipment in Afghanistan. It turns out that when you factor in the cost of transportation to a coastal facility in Pakistan – or airlifting it to Kandahar – and then you add the cost of putting it in a truck, guarding it, delivering it to the battlefield, and then transferring that one gallon into a piece of equipment that needs it – in extreme cases that gallon of gasoline could cost up to $400.

In the drive for energy reform – and this is critical – in the drive for energy reform the goal has got to be increased warfighting capability. Too many of our platforms and

too many of our systems are gas hogs. Of the top ten battlefield consumers of gasoline, only two are attack platforms. We also continue to make investments and acquisition decisions to build and procure increasingly complex systems that demand ever-increasing amounts of energy to power. In order to lower our reliance on fossil fuels, we need to improve the efficiencies of our systems and develop platforms that operate as a system of systems, are integrated together, and reduce our tactical vulnerability.

The stakes of the status quo extend even further, beyond the military, and cause second and third order effects on the environment. The carbon that's emitted from our ships, aircraft, and vehicles is a contributor to global warming and climate change. According to the projections endorsed by our own Task Force on Climate Change, global warming could result in an Arctic Ocean free of summer ice within 25 years. The security implications of this are dramatic. In short, we have not acted as very responsible stewards of our environment.

I do not seek to chastise anyone or to repent on procurement decisions made over the last decades when the dangers of fossil fuels and their effect upon the environment were not as well understood or as fully recognized. Nor am I naïve enough to believe that we can simply flip a switch and go off fossil fuels overnight. But I believe the Navy and Marine Corps have an obligation to do something now about our impact on the environment, and that we can take substantive measures to improve our core warfighting capabilities while improving our energy footprint.

The President has framed the argument for us and set the federal government on a path to reduce consumption of fuel and water, as well as reduce overall greenhouse gas

emissions. His leadership is a springboard for the Navy and Marine Corps to do more, to go farther, and to take up leadership across DoD, across the federal government, and across the broader United States in developing and using alternative sources of fuel. You may have heard this statistic – but it is striking to me; the Department of Defense uses more than 90 percent of all energy used by the federal government and 2 percent of all the energy used in the United States of America. Altering the Department of the Navy's consumption patterns WILL have a broad, noticeable effect and will serve as an example for the rest of our country. The technologies we sponsor, the technologies that we fund, and the technologies that we develop to viability will be those that the United States and the world will use in decades to come.

Leading change is not new for the Department of the Navy. We have done so repeatedly in the adoption of new technologies to power our ships. And resistance to change is not new either. In the middle of the nineteenth century the Navy traded wind for steam and the ability to maneuver in any direction at will. Naysayers swore at that point that the Navy was giving up a sure means of propulsion in favor of uncertain, dangerous, and probably infernal machines. The naysayers were wrong. The new technology of steam was proven to deadly effect upon the sailing ships during the Civil War.

Forty years later, the Liquid Fuel Board recommended that the Navy shift from coal to oil, which has twice as much thermal content and granted the ability to produce higher speeds in ships crewed by fewer Sailors. Once again, traditionalists argued against adoption because the late-nineteenth century American Navy already had a network of coaling stations around the world and an established infrastructure built

around coal. Again, they were wrong. The Navy persevered. The Navy commissioned the destroyer *PAULDING* in 1910 and the battleship *NEVADA* in 1911, both powered by oil. Oil created a tactical advantage – it allowed ships to stay at sea longer, replenish themselves underway from oilers rather than inport from coal bunkers, and oil reduced the need for ships to maintain huge divisions of stokers.

We are a better Navy and a better Marine Corps for innovation; we have led the world in the adoption of new energy strategies in the past. This is our legacy. Resistance to new energy sources has always happened – but in every case adoption of new technologies improved the strategic position of our nation through improvements in the tactical and operational capabilities of our forces.

So what are we going to do about it now? Well, the Navy and Marine Corps are doing great things already. We've already taken measures to make energy reform a way of doing business, we've put a down-payment on energy into our budget, and these measures are yielding a return on investment in both combat capability and resource allocation.

Just yesterday, Roger Natsuhara, the Acting Assistant Secretary for Installations and Environment, and RADM Cullom, our Task Force Energy lead, went down to Pax River for the first test of an F/A-18 engine run on biofuels. This fuel will power our very own Green Hornet, and that plane is going to fly within 3 years. And although the cost of the fuel used in that engine is high right now – it is still cheaper than putting gas into a generator on the battlefield in Afghanistan. And that cost will fall as the scale of

production is increased. And if the Navy and Marine Corps are part of the demand, we will help boost that production and cause the price to fall faster.

At the same time, improvements to F/A-18 engines that will be in service by 2015 will improve the efficiency of the aircraft by 3 percent. The improvements will not only allow the aircraft to fly longer, faster, or farther on the same tank, but could save us 127,000 barrels of fuel per plane, amounting to $15 million for the Fleet per year at today's fuel prices. If you believe the cost of fuel will go higher, as I think it will, the savings will only increase.

Just two months ago, the *MAKIN ISLAND*, our hybrid of the seas that uses an electric motor to power the ship at low speeds, went from where it was built in Pascagoula around to its homeport in San Diego. During that initial voyage alone, she saved close to $2 million in fuel costs. NAVSEA estimates at todays fuel prices the *MAKIN ISLAND* will save $250 million over the lifetime of that ship, and it doesn't include reduced maintenance costs because we're not stressing the gas turbines as much. We're placing hybrid electric systems like that on *MAKIN ISLAND* on 12 DDGs, and we're going to save almost $1 million per ship per year. Soon, you'll see all our new surface combatants built from the ground up with efficient systems installed during construction.

But it's not just about big systems, we're making small adjustments as well, like the new anti-fouling coating that's being tested in the fleet. We estimate the paint on the hulls of our ships will save up to $180,000 per year per ship in fuel costs due to reduced drag from barnacles and marine growth. Once implemented fleet-wide, in combination

with other measures like installation of stern flaps on our amphibious ships that increase fuel efficiency, an aggressive energy conservation program with strong incentives and the use of new voyage planning tools, for an additional investment of only $550 million, we'll get about $400 million savings per year. We will pay ourselves back in less than a year and a half, and we will continue to reap the benefits of the savings for the lifetime of the ships.

And we're seeing similar innovation and similar savings in our shore infrastructure. Solar power projects like those just awarded through Recovery Act funding at Miramar and Camp Pendleton will increase our solar capacity by 500 percent and will be the equivalent of providing power to 13,000 homes. All told, we have the opportunity to improve our energy generation ashore over the next ten years by almost 370 MW, enough energy to power 250,000 homes – or all the households in a city the size of Boston.

What the Navy and Marine Corps are doing now is great, but I am here to encourage you and us to go farther – to dream what might be rather than to simply accept what is. When President Roosevelt sent the Great White Fleet around the world over 100 years ago, he sent them without the funding to get them all the whole way back – but he was confident that Congress would want the fleet back and that the money would come, and it did. When President Kennedy said in 1961 we would go to the moon and return within that decade, most of the technology required was not even invented. Bold steps are in our nature as Americans and what make us a great nation; no one has ever gotten anything big done by being timid. I'm here to commit the Navy and Marine Corps to meet bold and ambitious goals in energy. I mean this about being bold and ambitious,

and so I'm going to announce five energy targets today that the department will meet over the course of the next decade.

First: we are going to change the way the Navy and Marine Corps awards contracts. The lifetime energy cost of a building or a system, and the fully burdened cost of fuel in powering those, will be a mandatory evaluation factor used when awarding contracts. We are going to hold industry contractually accountable for meeting energy targets and system efficiency requirements. And we're going to do more. We will also use the overall energy efficiency and the energy footprint of a competing company as an additional factor in acquisition decisions. We want industry to partner with us and take steps not just to provide us with more energy efficient products, but to produce those products in energy efficient ways.

Second: The Navy will demonstrate in local operations by 2012 a Green Strike Group composed of nuclear vessels and ships powered by biofuel. And by 2016, we will sail that Strike Group as a Great Green Fleet composed of nuclear ships, surface combatants equipped with hybrid electric alternative power systems running biofuel, and aircraft flying only biofuels – and we will deploy it.

Third: the Department of the Navy will by 2015 reduce petroleum use in our 50,000 strong commercial fleet in half - by 50 percent. We'll do this by replacing our current fleet, as they go out of service, with a new composite fleet of flex fuel vehicles, hybrid electric vehicles, and neighborhood electric vehicles. Moving to biofuels and electric vehicles will benefit the local communities where our bases are located and will spur adoption of similar vehicles in those neighborhoods.

Fourth: the Department of the Navy will by 2020 produce at least half of our shore-based energy requirements on our installations from alternative sources. We will boost our usage of renewable energy and in some cases we will supply power *to* the grid from solar, wind, ocean, or geothermal sources generated by the base. We're already doing this at China Lake, where our on-base systems generate 20 times the load of the base.

Lastly, and maybe most importantly, I am asking all of us to meet a very ambitious goal. Today, about 17 percent of our total energy consumption comes from alternative sources. By 2020, half of our total energy consumption for ships, aircraft, tanks, vehicles, and shore installations will come from alternative sources. Right now I'm told 40 percent is a more realistic goal and even that remains difficult because of the cost and logistics.

But you know, our Navy and Marine Corps has never backed away from a challenge. With hard work and innovation from everyone in this room, as well as our researchers, scientists, and every Sailor and Marine that we have – we can get there. To paraphrase the movie *Field of Dreams*: if the Navy comes, they will build it.

Protecting our nation, preserving our security, and promoting freedom around the world requires the Navy and Marine Corps to always be forward deployed. We go where we are needed and we decisively accomplish our mission, whatever that might be. We must be no less bold in our thinking when it comes to energy reform, no less willing to embrace risk. I am not asking you or the navy or the Marine Corps to do the impossible. I am asking you to let the reach of your imagination match the reach of the United States

Navy and Marine Corps. I am asking you to make the future a more secure and better place. Thank you and Godspeed to all of you.