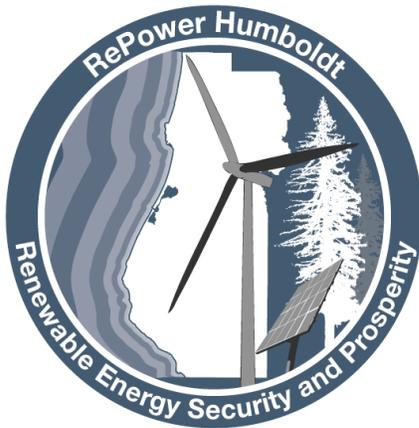


RePower

Humboldt



Public comment received on RePower
Humboldt DRAFT Strategic Plan
September/October 2012



Summary of Public Comment on RePower Humboldt Strategic Plan Draft

Commentor	Organization	Medium	Date	Summary of Comments	Response (proposed)
Cecil, Ruthanne		written comments	26-Oct-12	Further research is needed before seeking municipal endorsements. Environmental impact assessment and public hearings will be needed prior to government action to implement the plan. Energy efficiency should be top priority. Biomass is not a carbon neutral resource. A local study for our bioregion should be conducted as recommended in IM15 and should include complex carbon accounting methods. The terms "renewable" and "sustainable" are questionable. Perhaps a set of criteria for true sustainability can be reached locally if it involves a high quality community discussion that looks at complex issues. The threat of forest fires should not be used as a justification for over-cutting trees to supply biomass power plants. The active forest restoration industry and fire councils in this region should be consulted.	Make sure it is clear that we treated biomass as carbon neutral in our study (clarify in Section 7.1, Biomass). The concerns expressed regarding biomass energy are already noted in the plan (LTS7, IM15, IM16). It is clearly stated that further research is needed to assess the economic and environmental sustainability, and the greenhouse gas implications of using local biomass resources for energy production.
Drake, Jake		email	12-Oct-12	Strongly support overall plan. Hanging clothes on clotheslines to dry is a simple measure we can all take to reduce carbon emissions.	While using clotheslines is not specifically noted in the plan, it could be included under the energy efficiency category (LTS2, IM2, IM3).
Faust, Melanie		oral comments	15-Oct-12	A summary of potential environmental impacts associated with each of the proposed renewable energy technologies would be a useful addition to the Strategic Plan. The plan should consider the potential issues and environmental impacts associated with ash generation from biomass power plants and its disposal.	Add a link to the CEC's Energy Aware Siting Guide, Appendix E, Environmental Impacts of New Landside Utility-Scale Facilities. Add a note in Section 7.1, Biomass that acknowledges the ash disposal issue could be a potential barrier. Depending on ash characteristics it can potentially be used as a soil amendment or for other uses (e.g., an additive to concrete). Ash composition should be assessed to ensure there are not significant levels of heavy metals or other hazardous contaminants. Contamination is a more serious issue with urban sources of treated wood waste. Also, fly ash typically has higher levels of heavy metals, so it is best if fly ash and bottom ash are kept separate.
Kalt, Jennifer		email	27-Sep-12	Consider the potential issues and environmental impacts associated with ash generation and disposal from biomass power plants.	Add a note in Section 7.1, Biomass that acknowledges the ash disposal issue as a potential barrier.
McNamee, Kerry		email	23-Sep-12	In full support of the plan. Hope the peak scenario is achieved. Excited to see wind and wave power developed.	No changes required.
Nesbitt, Gregory		email	14-Oct-12	Not enough information on the expected cost of recommended options.	Responded via email and pointed him to the Resource and Technology Assessment Report and the Economic Analysis Report. These reports contain a lot more information regarding the estimated cost of various scenarios and provide documentation regarding how the cost estimates were derived and where various cost data came from.
Nesbitt, Gregory		email	29-Oct-12	Examine uncertainties that accompany any suggested course of action and try to quantify those uncertainties wherever you can. Try to understand under what conditions going local is a good thing and under what conditions it could prove to be a big mistake.	In the Technology Assessment Report, Section 3.1, we discuss the Monte Carlo sensitivity analysis that was performed. It was used to assess how sensitive our Regional Energy Planning Optimization Model was to changes in various model parameters. Sixty parameters were varied by ±10% and the resulting change in model outputs (cost and greenhouse gas emissions) ranged by about ±3% to ±5%. While this sensitivity analysis did not explore all uncertainties, it did indicate that the model was rather robust in finding an optimal solution.
Orahoske, Andrew	Environmental Protection Information Center	written comments	26-Oct-12	RePower Humboldt plan is a valuable working document. Support plan to emphasize efficiency first. Ask that further efficiency opportunities be addressed before additional generation is considered. Should consider local energy authority/public utility that could better serve the community and promote renewables. Have serious concerns regarding the operation of industry-standard wind turbines in the Cape Mendocino area, which is identified as an Important Bird Area by the National Audubon Society. There are risks to birds and bats, including endangered Marbled Murrelets. Recommend that the American Bird Conservancy's Smart Bird Guidelines be incorporated into the RePower Humboldt plan. Questions the emphasis on biomass energy in the plan; recent literature claims that burning biomass is as bad or possibly worse than burning fossil fuels in terms of climate change. Concerned that deforestation and forest degradation due to timber harvest can impair our the ability of forests in our region to sequester carbon.	The RePower Humboldt plan emphasizes energy efficiency first. Also recommends examination of community energy models, like Community Choice Aggregation, that can provide for greater local control of energy decisions. The plan identifies Cape Mendocino as a prime wind energy location and recommends that the community continue to consider Bear River Ridge for wind energy development. The plan acknowledges there are potential conflicts due to the designation of this area as an Important Bird Area. Ultimately these potential environmental impacts would need to be assessed in a project specific environmental review. Biomass is identified as a key resource that could be expanded. Plan acknowledges that biomass energy development must be further examined to assess if it's sustainable and can provide carbon emission benefits. Recommends that biomass energy plans should be consistent with local forest restoration needs and priorities. The debate regarding the carbon emission benefits and impacts of biomass power is ongoing and should be followed.
Rische, Carol	Humboldt Bay Municipal Water District	oral comment via phone	24-Sep-12	Include pressure retarded osmosis (PRO) power generation as a potential renewable energy source for Humboldt County, particularly at the site of the old Samoa Pulp Mill.	Add PRO power to LTS8 and add an Implementation Measure in Chapter 10 for an Osmotic Power Research Center in Humboldt.
Willis, Roy		email	27-Sep-12	Proposed local energy generation projects often face many challenges, including economic hurdles and public concerns/opposition. In the Town Hall Meeting small group session his group agreed that energy efficiency should be the first priority, followed by distributed generation, biomass and wind. Notes that current biomass electricity generation only meets about 10-15% of local demand, not 30%. Notes that NOx and particulate matter emissions from biomass plants can be a concern. Cost of bold and peak scenarios should not be underestimated, should include cost of transmission and distribution system upgrades. No new hydro facilities have been permitted in CA in last 2 decades. The 60 kV transmission lines that run south to Willits are for distribution only and are not capable of importing or exporting power. Exporting power from Humboldt is very rare and not normal operation.	CEC data shows biomass provided about 27% of local electricity supply in 2010. Cost estimates for bold and peak scenarios were based on the best information available at the time of the study and were obtained from reputable industry sources. See the Economic Analysis Report, Appendix B for details on the cost analysis methodology and data sources. Deal with issue of T&D upgrades and their impact on the cost of the Bold and Peak scenarios. Change discussion about transmission lines to indicate there are only 2 major connections (115 kV) to the larger electrical grid.
Wilson, Mike	Humboldt Bay Harbor, Recreation and Conservation District	email, oral comments	28-Sep-12	Would like to see a wave power research facility located on the Samoa Peninsula at the site of the old pulp mill (Freshwater Tissue site). Later conversations noted that the research facility could also include offshore wind, biomass and pressure retarded osmosis power.	Add PRO power to LTS8 and add an Implementation Measure in Chapter 10 for an Osmotic Power Research Center in Humboldt. Identify old pulp mill site as an ideal location for an energy research center that covers wind, wave, biomass and PRO power.
Winkler, Michael	Redwood Energy	email	23-Sep-12	Suggested additions to the report include: examples to illustrate recommendations, links to outside information sources, discussion of smart grid and time varying pricing, importance of PG&E power plant even if it doesn't run very much (e.g., in Peak scenario), information on how grid upgrades would be financed and paid for, explain demand response, add heat pump clothes dryers and process heating to LTS5, discussion of electric vehicle charging issues, add possibility of new biomass plants running in load following mode. Asks for clarification regarding percentage of heat and transportation from renewables.	Examples to illustrate recommendations and links to outside information sources are beyond the scope of the strategic plan document, but are included in a companion document called the RePower Humboldt Regulatory and Policy Guide on Renewable Energy and Energy Efficiency for Humboldt County Local Government. Time varying pricing is also covered in the Regulatory and Policy Guide. Add note to page 27 in section on PG&E power plant regarding what an important role it plays even if it doesn't run very much (like in the Peak scenario). Add demand response to LTS2; note also that demand response is covered in the Resource Technology and Assessment Report. Revise LTS5 to cover more than just water and space heating. Add brief comment about potential peak demand issues with electric vehicle charging; this will be covered in more detail in the North Coast Plug-in Electric Vehicle Readiness Plan being prepared by RCEA, SERC and GHD. Add mention of new biomass plants running in load following mode. Page 20 explains that the percent adoption for electric vehicles and heat pumps refers to the penetration of these technologies into the market place. This is further explained in the Technology Assessment Report. This is not the same as the percent of heating or transportation energy that comes from renewable resources.

Summary of Public Comment on RePower Humboldt Strategic Plan Draft

Commentor	Organization	Medium	Date	Summary of Comments	Response (proposed)
Informal walk-in commentors		oral comments		Plan is interesting. Would like to see financing program that will cover energy efficiency and renewable energy projects for residential applications.	No changes required.
RePower Humboldt Professional Advisory Committee (phone/in-person meeting)		in-person/phone meeting	21-Sep-12	<p>Include distributed biomass as an option. Provide more examples of hourly load and supply plots (p. 26) on website. Consider allowing biomass to be used in load following mode. Consider smart charging for PEVs (demand response). Fuel switching assumptions in model scenarios (38% PEV and heat pump penetration) are too optimistic. Note how this affects results, especially greenhouse gas emission reduction estimates. Explore this further in future research.</p> <p>Note that in the peak scenario the PG&E power plant is still very important. It doesn't run very many hours, but it is a strategic asset that provides critical reserve capacity and reliability benefits. It enables the high percentage of intermittent renewables in the peak scenario. Need a conceptual timeline for the renewable energy build-out -- which projects? how much capacity? in what time frame? Key lesson learned is that increasing renewable electricity and reducing greenhouse gas emissions are distinct objectives; pursuing one does not ensure the other. The energy efficiency estimates are based on an analysis that only considers existing, cost-effective measures. Greater potential should be considered. Also, utilities are mandated to pursue all cost effective efficiency, so we should consider including 100% efficiency penetration in the bold scenario. The strong focus on biomass energy may not be well received in our region. Need to determine what is acceptable to the community. Need to assess potential environmental impacts and carbon neutrality assumption. Regulatory restrictions on how biomass is treated as a renewable fuel could impact it's cost effectiveness. The peak scenario barely reaches the state's greenhouse gas reduction goals; we should keep the peak scenario as an option. We should pursue a "no regrets" approach for near-term next steps that preserves flexibility and allows for needed adjustments without great sacrifice. Major transmission upgrades would be expensive and challenging to pursue.</p>	<p>Add biomass to distributed generation. Note that fuel switching assumptions in model scenarios (38% PEV and heat pump penetration) are too optimistic; note how this affects results, especially greenhouse gas emission reduction estimates. Note that in the peak scenario the PG&E power plant is still very important as a strategic asset that provides critical reserve capacity and reliability benefits. Develop a conceptual timeline for the renewable energy build-out. Note that energy efficiency estimates are based on an analysis that considers existing, cost-effective measures only, and greater potential is possible. Note that regulatory restrictions on how biomass is treated as a renewable fuel could impact it's cost effectiveness. Recommend a "no regrets" approach for near-term next steps that preserves flexibility and allows for needed adjustments without great sacrifice. Note that major transmission upgrades would be expensive and challenging to pursue.</p>
Bryan Jungers	Professional Advisory Committee	marked up draft document	21-Sep-12	<p>Forming a leadership group to move plan forward is very important; need specific IM for this. Living document should be reflected in planning process. Include distributed generation biomass. Near-term next steps should be action oriented and detailed enough to be useful. Evaluation plan is too brief. Consider a definitions section for the appendix.</p>	<p>Add leadership group to implementation measures. Add biomass distributed generation. Make near-term next steps more action oriented where possible.</p>

(Briefly, the experience and education that I bring to my comments... Recently retired, I have a 35-year history of work and volunteerism in forest and energy issues. Beginning in 1977, I helped to found the Environmental Protection Information Center, then went on to be the second Project Director of the Forest Improvement Center at the Redwood Community Development Council (1980-1981), the precursor to the RCAA-NRS of today. During that same period I was actively lobbying and organizing on forest herbicides, with EPIC, Stop Toxic Sprays, and the Humboldt Herbicide Task Force, followed by a countywide ballot initiative in 1980. After several years as a grassroots fundraiser, I returned to Humboldt to edit and publish the countywide monthly newspaper, the Country Activist (1984-1990), also working with the grassroots forest activist and forest restoration communities and with EPIC during this time period. In 1988 I was instrumental in forming the Northcoast Citizens countywide group, which put 3 successful measures on the ballot in 1988 and another 3 (unsuccessful) in 1990. I returned to school in the 1990's, getting a paralegal certificate in 1991, a B.A. in political science from HSU in 1994, and a J.D. (law degree) in 1997 from Univ. of California, Hastings, at the age of 51. After a few years of international law and policy, I became the Program Director (2000-2007) and then the Executive Director (2007-2010) of the Center for Environmental Economic Development, a local nonprofit focused on sustainable energy, economics, communities, forests and watersheds. I am a member of the City of Arcata's Energy Committee. These comments are my own.)

Comments by Ruthanne Cecil on the Re-Power Humboldt Strategic Plan

Thank you for the opportunity to comment. You have put together a good overview of potential action areas and some recommendations, and are to be commended for your thoroughness and your inclusiveness with stakeholders and peer review.

There are several points I'd like to briefly make, and to encourage you to do further research in these areas prior to seeking municipal endorsements for your 2030 strategy. I am focusing mostly on forest biomass concerns, but raise a few other issues as well.

My understanding is that your study is not a government-mandated plan or activity, but rather an opportune result of a research contract with state funding. As such, I didn't address the lack of detailed environmental impacts. That full step, along with public hearings, will be needed prior to government action to implement.

Overall, I believe the goal of local control has clouded the reality and dangers of continued and increased biomass usage for electricity needs. We should be phasing out of biomass, not increasing it. I will comment in 3 basic areas: efficiency; greenhouse gas accounting; and definitions of renewable energy and sustainable forestry, with brief comments on fire management.

I. Efficiency questions:

A. Energy efficiency policies and implementation of technical options for energy efficiency. As you mentioned, energy efficiency measures are the cheapest option and the highest priority to reduce electricity demand and thus decrease emissions. Of course, it is difficult to implement because in many ways it requires voluntary actions and behavioral changes. In the study it receives few words, probably because of the parameters of your funders for this study. Local municipalities and other government entities should, however, address this priority area prior to endorsing your strategic plan,

and begin timelines to move forward on Energy Efficiency measures prior to more capital-intensive options. Since this measure deals with decreased demand, rather than increased supply, it probably has few negative environmental impacts. Certainly, your “peaks” of projected need should be lowered over time, not increased.

B. Efficiency and locality. Improving the local-ness of resource material for power plant electrical generation does not necessarily change their emissions. If the sources are biogenic, they will emit CO₂ and other greenhouse gasses upon combustion, regardless of the location and locality of the sources. Carbon-based resources, whether wood, woody biomass, sewage, cooking oil, waste, natural gas, oil, or coal, will emit greenhouse gasses. It is important, since your current and projected mixes of energy sources are largely biomass and natural gas, to determine which of these two is the most efficient in producing the least amount of emissions per KWH of electricity produced, and also per tonnage or board feet or per dollar, of raw material input, regardless of whether the resource material is imported or exported from our local counties.

II. The accounting for “replacement” or “renewability” must be a separate issue from efficiency. A “critical accounting error” in current calculations for biomass and biofuel carbon accounting needs to be corrected: we must question the net zero carbon assumption, and study this matter thoroughly, since your strategic plan is based on this house of cards.

A. Several scientific, legal and policy sources have challenged the current accounting methodology, which assigns zero emissions to woody biomass in power plants, versus GHG tonnage for fossil fuel emissions. This is based on the now-challenged assumption that because trees grow back, there is a net zero emissions impact. (See, for example, “Fixing a Critical Climate Accounting Error,” in *Science*, vol. 326, p. 527-28, Oct 23, 2009, by Searchinger, Hamberg, et. al. also see the Center for Biological Diversity’s challenge to EPA, dated July 28, 2010, entitled “Request for correction of information disseminated by the Environmental Protection Agency regarding emissions from biomass combustion in the inventory of U.S. greenhouse gas emissions and sinks,” by Nikki Reisch and Kevin Bundy. Both study and comments are available as pdfs online.)

A study specific to our bioregion (as you suggest in IM15) should be designed to look carefully at these critiques, and include Searchinger, CBD, and others and to develop a set of projections/ scenarios that recalculate GHG emissions using corrected figures, such as CO₂ emissions at smokestack and in the forest, and to fairly compare efficiency ratios. A more complex calculation model would take this into account, and prevent the unfair free ride and subsidies which biomass producers now enjoy. Computer scenarios based on these different assumptions may lead to reformed results on the commendability of biomass. Your study acknowledges this controversy and recommends further scrutiny. More than a Life Cycle Analysis is needed. National and local accounting standards and practices could eventually change to reflect the needed reforms. A lively debate on this and related issues has ensued, in the scientific, legal and civic communities. I have additional bibliographic information available as well.

B. My simplified explanation and argument. The carbon cycle is an accepted scientific principle that recognizes that plants take in CO₂ and give off O₂, and animals take in O₂, and give off CO₂. Living land masses such as forests, soil, grasslands, wetlands, oceans, provide massive carbon sinks where living material draws down or “breathes” in CO₂ from the atmosphere and produces O₂ via photosynthesis. Only living material can do this. A pile of decaying logs will give off some CO₂, as do animals, but has no power to produce more O₂. So keeping a live, green canopy, active in photosynthesis, is essential for this O₂/ CO₂ exchange to continue.

While spikes in CO₂ production have occurred down through geologic time, current spikes in CO₂ are much higher and represent a marked increase. It is likely this corresponds with global resource extraction, rapid industrialization, deforestation and desertification in the last 500 years. If this is the case, it behooves us to seriously consider alternatives to rapid forest cutting, because of multiple impacts on CO₂ and O₂ such as:

- 1) increased emissions from combustion
- 2) decreased CO₂ drawdown from atmosphere from green canopies/photosynthesis loss
- 3) decreased C sequestration or carbon holding (carbon held as plant sugars, woody)
- 4) degraded forest soils, with increased CO₂ emission and further loss of C-sequestration
- 5) decreased O₂ production, from less photosynthesis

III. Questions on “Renewable Energy” and “Sustainable Forestry”

A. Targeted percentages of “renewables” in the energy mix portfolio are now part of legal policy. Terms of art often dictate policy. If such terms are poorly defined or ambiguous, policies may be as well. Energy activists coined “renewables” as a goal in the 1970’s, long before the awareness of climate change and carbon-based emissions had become common knowledge. There is no inherent reason why something which is renewable is automatically better for the atmosphere. Using too much of a renewable can certainly lead to resource depletion, as the crisis in fisheries has so vividly shown. A set of questions about energy options might well include, among others:

- does the power source include carbon?
- is it emission-free? why?
- how much can be used without endangering or degrading the area/ forest/ landmass?
- what is the rate of replacement?
- how many years to return it to its pre-harvest status?
- what are the environmental impacts of each alternative option?

B. Perhaps “sustainable” is a better term of art, but it too seems to be squishy in definitions. Some foresters speak of sustainable forestry as the sustained growth and harvest of merchantable timber. A fertilized tree farm might meet their definition, but is this a forest? Are original forest qualities protected? Perhaps a set of criteria for true sustainability can be reached, at least locally, but a high quality community discussion is definitely needed, one which will look at such complex issues as:

- what is a healthy, dynamic forest?
- what are environmental impacts of forest management?
- what are the GHG impacts?
- can the healthy forests of a region maintain a series of biomass power plants without slowly degrading the resource? How many and how big?
- what about power plant byproducts, such as fly ash?
- what are the quantities (in board feet) that will generate the MW (megawatts) the counties may need?
- will continued imports of natural gas better protect our forest resource?
- have Life cycle Analyses been done? Do they include direct and indirect land use changes? which ones?
- has the highest and best use of harvested materials been taken into account? Minimum cut? Minimum combustion?
- is the forest achieving optimal CO₂ capture? optimal C holding power (sequestration)?
- is the biomass actually wood waste such as brush or used wood? Or is it actually small trees? what diameter? Are there alternative uses for these trees, such as structural poles for outbuildings, posts for indoor rooms, chairs and tables? Could the small trees continue to slowly grow, producing future old growth hardwood and softwood mixed stand/ all-age/ mixed-use forests?
- are there higher public goods than “local control”?
- have we adequately cut electricity demand through conservation and energy efficiency?

C. The threat of forest fires should not be seen as a blanket justification for over-cutting trees to supply biomass plants. Only a small percentage of fires occur each year. Removing brush and excessive fuel buildup from poorly managed forest areas, especially previous clearcuts, may be necessary, and may justify a certain quantity of efficient combustion for heat or electricity. The active forest restoration industry and fire councils in this region are the ones to consult on doing this right, from an ecological and job-producing perspective. They understand the mix, and the possibilities for on-site fire management as well. (See, for example “Living with Fire”, 3 articles in Forest and River News, Summer 2012, Trees Foundation newsletter for Grassroots Conservation and Restoration in the Redwood Region. At www.treesfoundation.org)

Many of your implementation recommendations are premature. Further studies are needed prior to long-term commitments to misguided investments. Thank you.

--Ruthanne Cecil, P.O. Box 216, Arcata, CA 95518-0216

Links to research articles submitted as part of public comment by Ruthanne Cecil

Request for Correction of Information Disseminated by the Environmental Protection Agency Regarding Emissions from Biomass Combustion in the Inventory of U.S. Greenhouse Gas Emissions and Sinks, Center for Biological Diversity, July 28, 2010.
epa.gov/quality/informationguidelines/documents/10006.pdf

Fixing a Critical Climate Accounting Error, Searchinger, T.D., et. al., *SCIENCE* VOL 326 23, pp. 527-528, OCTOBER 2009.
<http://www.princeton.edu/step/people/faculty/michael-oppenheimer/recent-publications/Fixing-a-critical-climate-error-T.-Searchinger-et-al-2009-.pdf>



James Zoellick <jiz1@humboldt.edu>

Kudos

2 messages

Jake Drake <jakeadrake@gmail.com>

Fri, Oct 12, 2012 at 10:03 AM

To: comments@redwoodenergy.org

I am so onboard with everything you are doing and the recommendations you are making.

A small and simple step that can easily be taken to further diminish our carbon footprints would be for all of us to use clotheslines as the primary source of drying our clothes. It's simple, it's fun, there is less wear and tear on the clothes and it's free. My son and I had a business a few years ago, "Well Hung", installing clotheslines for people who later told me that their power bills had been drastically reduced since they had ceased using their dryers.

Please keep up the good work. Jake Drake

Matthew Marshall <mmarshall@redwoodenergy.org>

Fri, Oct 12, 2012 at 12:26 PM

To: Jake Drake <jakeadrake@gmail.com>

Hello Jake,
Thanks for your comments and enthusiasm.

Also, thanks for your efforts on real-world, boots-on-the-ground efficiency related to clotheslines--even in our often-moist climate area they can work just fine, and are a near-zero cost way to save a good deal of energy in the home. As you probably know for your work, drying clothes typical adds up to something like 5-10%(or maybe more in our mild climate) of total home energy consumption, which is a pretty big chunk to address with a simple low-tech solution--sometimes a technological step backwards is actually moving in the right direction.

Regards,
Matthew

Matthew Marshall
Executive Director
Redwood Coast Energy Authority
[707-269-1700](tel:707-269-1700)

[Quoted text hidden]

Melanie Faust, City of Arcata Energy Committee

Comments received orally by Jim Zoellick at the City of Arcata Energy Committee Meeting on October 15, 2012.

Suggested that a summary of potential environmental impacts associated with each of the proposed renewable energy technologies would be a useful addition to the Strategic Plan.

Also suggested that we should consider the potential issues and environmental impacts associated with ash generation and disposal from biomass power plants.



James Zoellick <jiz1@humboldt.edu>

Fairhaven Power ash and discharge issues

Jennifer Kalt <jenkalt@gmail.com>

Thu, Sep 27, 2012 at 1:20 PM

To: Jim Zoellick <James.Zoellick@humboldt.edu>

Jim,

thanks for putting on a good meeting last night. Attached are some docs that will give you a sense for the constraints that may be involved with increasing biomass - my understanding is that the Regional Water Quality Board has ordered sampling by Oct. 15, and then will be looking at ways to dispose of the ash that will protect water quality. It doesn't seem insurmountable necessarily, but could be a constraint to expanding biomass in significant quantities that I'm sure you will want to consider in your analysis.

These are great conversations to be having now that a specific project is not being proposed. People will be able to be more objective and it's good to have a process that involves discussing positive actions, even if the details will be difficult in many ways.

I was interested to her your reply to the question about the GPU, and I hope you and your colleagues can explain that to the Board of Supervisors in a way that clearly illustrates the positive impacts on our economy, which I think is the majority's overarching concern at this point. Sundberg in particular has requested an analysis of the costs of implementing the GPU before each element is brought before them, so your thoughts on the positive fiscal effects of adopting the Energy Element will be helpful for him to understand (esp. since that is one of the "optional" elements that the realtors and developers would like to see canned for some reason). Jen

2 attachments

 **FairhavenOrder2010.pdf**
47K

 **FairhavenOrder2010AttachmentA.pdf**
10K

Links to research articles submitted as part of public comment by Jennifer Kalt

California Regional Water Quality Control Board, North Coast Region, ORDER NO. R1-2010-0010, REQUIRING TECHNICAL INFORMATION PURSUANT TO WATER CODE SECTION 13267(b) FOR DG Fairhaven Power, LLC, Fairhaven Power Plant, WDID NO. 1B85026RHUM.

http://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2010/100113_10_0010_13267b_Fairhaven.pdf

http://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2010/100113_100113_Fairhaven13267_AttachA.pdf



James Zoellick <jiz1@humboldt.edu>

HSU presentation

Kerry McNamee <kem143@humboldt.edu>

Sun, Sep 23, 2012 at 8:13 PM

To: comments@redwoodenergy.org

Hello,

The presentation Matt and Jim gave was excellent. I feel so honored and fortunate to live in a place where there is so much consideration given to our future energy sources. I am studying environmental planning at HSU and am graduating in May. It is exciting for me to envision future planning projects of wind and wave power development, and the trickled down community infrastructure changes that will bring about. We can lead the state in this transition, and need to... because we can, and because leadership needs to be achieved if we hope to implement these technologies. I hope the peak scenario is achieved and I'm in full support!!

Thank you for all your hard work!
Kerry McNamee

P.S. Matt--you have a great voice :)



James Zoellick <jiz1@humboldt.edu>

Repower Humboldt Comments

3 messages

gregory.nesbitt@juno.com <gregory.nesbitt@juno.com>
To: comments@redwoodenergy.org

Sun, Oct 14, 2012 at 12:14 PM

I moved to Humboldt county in 2002, after retiring from a 39 year career as an executive and generation project developer in the electric utility industry, both in California and Louisiana. I am responding to your request for comments on the Repower Humboldt Plan.

First, an informed assessment on the plan is not possible because the necessary information with which to evaluate the economics of the plan was not provided. What was provided were conclusions about the economics of a favored proposal, which in studies such as this often tend to be biased in favor of the proposal. Whether the plan is economically feasible is still to be demonstrated. Much more work is needed in this area.

The goal for the plan that drove the study, to have the majority of Humboldt's energy needs met locally, ignores another important need of the area: local residents must be able to afford the energy provided for their use. Humboldt County already has some of the highest electric rates in the country; often the county has the highest gasoline prices in the country as well. High energy prices tend to depress the economy of this region. To propose increasing these prices further is probably not good for the majority of residents. Your study should give more emphasis to the costs of the various proposals and what adopting any proposal is likely to cost local citizens. Certainly your emphasis on efficiency of use holds some promise for reducing energy costs. I would suggest in addition, however, that any cost estimates you cite be presented as ranges; the actual cost of energy sources still in development is highly uncertain.

Studying alternative energy futures for our region is a worthy endeavor. I commend you for taking on this challenge. We need to understand our options as well as possible so continuing to study the alternatives is desirable. All such studies, however, should be unbiased and seek to identify the "best" alternatives, however "best" is defined for Humboldt County. Your definition of "best" turned out to be "local supply". I am afraid that is not sufficient to insure a robust economy for Humboldt County in the future. Your study needs more work.

Greg Nesbitt
936 Manzanita Ave
Eureka, CA 9503

[Fast, Secure, NetZero 4G Mobile Broadband. Try it.](#)

Matthew Marshall <mmarshall@redwoodenergy.org>
To: gregory.nesbitt@juno.com
Cc: comments@redwoodenergy.org

Fri, Oct 19, 2012 at 12:21 PM

Hello,

Thanks for your comments. Regarding the economics behind the analysis, if you are interested there is significantly more detail/background info available on our website - <http://www.redwoodenergy.org/>

[programs/repower](#). On the right hand side of that page there are two documents that can be downloaded –the background technical analysis report and the background economic analysis report. So those documents can provide a lot more specifics on the related particulars and assumptions that were used.

That said, while a concerted effort was made to be fair and rigorous with the economic analysis, high-level analysis can only provide context and a starting point. It really comes down to the details of any given project on whether things actually pencil out and make economic sense, and there are of course many changing variables. Even for the conceptual level of analysis, economics are a moving target--the cost of solar energy systems dropped by about half just during the period of this study; natural gas prices are currently very low (which may or may not continue to be the case); the impact of California's new CO2 Cap and Trade system are yet to be known; changes in regulations related to biomass plants could dramatically impact their economic viability. . . the list goes on and on. The intention in the final report was to present the results of all the detailed analysis in a clear and concise way that wasn't too overwhelming, but your point it a good one that it is important to clearly communicate that the scenarios are illustrative examples and that any cost numbers are ranges with varying levels of uncertainty and that the analysis is really a snapshot in time based on current information and assumptions.

Thanks,

Matthew

Matthew Marshall

Executive Director

Redwood Coast Energy Authority

[707-269-1700](tel:707-269-1700)

From: gregory.nesbitt@juno.com [mailto:gregory.nesbitt@juno.com]

Sent: Sunday, October 14, 2012 12:14 PM

To: comments@redwoodenergy.org

Subject: Repower Humboldt Comments

[Quoted text hidden]

James I. Zoellick <James.Zoellick@humboldt.edu>
Reply-To: James.Zoellick@humboldt.edu
To: Matthew Marshall <mmarshall@redwoodenergy.org>

Mon, Oct 22, 2012 at 12:39 AM

Good job, Matthew. I was planning to get back to Greg with a response, but you beat me to it. I appreciate you providing responses when people submit comments.

Cheers!

Jim

Jim Zoellick
Senior Research Engineer
Schatz Energy Research Center
Humboldt State University
Arcata, CA 95521
[707-826-4350](tel:707-826-4350)
jimz@humboldt.edu
www.schatzlab.org

[Quoted text hidden]



James Zoellick <jiz1@humboldt.edu>

FW: Repower Humboldt Comments

Matthew Marshall <mmarshall@redwoodenergy.org>
To: comments@redwoodenergy.org

Mon, Oct 29, 2012 at 12:19 PM

FYI, additional comments in reply to my reply.

From: gregory.nesbitt@juno.com [mailto:gregory.nesbitt@juno.com]
Sent: Monday, October 22, 2012 1:48 PM
To: mmarshall@redwoodenergy.org
Subject: RE: Repower Humboldt Comments

Hi Mathew,

Thank you very much for your responsive reply to my comments on the Repower Humboldt report. I appreciate your candor. My initial reaction to the report was that it leaned over backward a bit too much to prove that Humboldt County should favor local sources of energy. All things being equal, local sources are fine but in my opinion low energy prices and environmental cleanliness are far more important. After all we import into Humboldt County much of what we consume. As you acknowledge in your report the economic feasibility of a future energy source is often highly uncertain because the future is difficult to predict. I'll cite just one example of that has informed me on that over the years.

During Jimmy Carter's administration the prevailing wisdom was that we were running out of natural gas and so natural gas should not be burned in power plants but should instead be preserved for "higher and better" uses. As a result President Carter proposed and signed the Fuel Use Act which stipulated that after 1990 no power plant in the U.S. could burn natural gas. In response our nation's utilities initiated a huge program to switch to coal. Many large coal-fired plants were built in response to President Carter's policy. The facts were, however, that natural gas was in short supply only because the well head price of gas was set at such a low level by the federal government that drilling for natural gas was not economically attractive; in other words the shortage was artificial. When President Reagan took office he had the limit removed on the well head price of gas and as gas supplies increased repealed the Fuel Use Act. But the damage had been done. A large number of coal plants were built replacing perceived gas shortages with CO2 emission problems. I refer to this bit of history only to suggest that we pick one course of action too early at the peril of being wrong and paying a high price.

I would respectfully suggest that you give some additional emphasis in your report to the uncertainties that accompany any suggested course of action and try to quantify those uncertainties wherever you can. Under one scenario going local may be the best thing to do; under another it may carry a large cost. We should at least

understand under what conditions going local is a good thing and also under what conditions it could prove to be a big mistake. Knowing those things the County can then plan if conditions develop different from those expected.

Again, thank you for taking the time to respond to my concerns. If there is anything I can do to help you with your analysis, please let me know. I spent 39 years in the electric utility industry; much of that time I was involved with energy supply planning for San Diego Gas & Electric Company and power plant development for Cleco Corp. in Louisiana. I also served on EPRI's Research Advisory Committee and six years on the board of the North American Electric Reliability Council.

Sincerely,

Greg Nesbitt

936 Manzanita Ave

Eureka, CA 95503

Woman is 53 But Looks 25

[Mom reveals 1 simple wrinkle trick that has angered doctors...](#)

ConsumerLifestyleMag.com



Keeping Northwest California wild since 1977

October 26, 2012

Redwood Coast Energy Authority
517 5th Street
Eureka, CA 95501

Schatz Energy Research Center
Humboldt State University
1 Harpst Street
Arcata, CA 95521-8299

RE: EPIC comments on the draft RePower Humboldt Strategic Plan

Dear Responsible Parties,

I am writing on behalf of the Environmental Protection Information Center (“EPIC”), a nonprofit organization that works to protect and restore ancient forests, watersheds, coastal estuaries, and native species in northwestern California. Consistent with this mission we offer our comments on the draft RePower Humboldt Strategic Plan (“Draft Plan”). We would also like to commend your organizations for developing a valuable working document and very much look forward to continuing dialogue.

Energy Efficiency and Conservation

We note that the Draft Plan appropriately lists improving energy efficiency and conservation right up front as the most immediate way to reduce the region’s carbon footprint. There are many activities, individuals, and businesses that have a much higher demand for energy than others. For example, the electricity demand for Sun Valley Group bulb farms in the Arcata Bottoms is very high and far outweighs many other local businesses. Similarly, some indoor marijuana growing operations in the Arcata and Eureka area contribute a substantial amount to the area’s carbon footprint. There are opportunities to explore law and policy changes that could significantly reduce this energy demand.

We request that the Draft Plan further address opportunities to expand energy efficiency efforts. Lastly, in EPIC’s view, there should first be a greater attempt to expand energy efficiency measures and quantify those gains before additional power generating facilities are considered.

Regulated Private Utility vs. Public Utility

Pacific Gas and Electric, PacifiCorp and other private entities have primary obligations to their shareholders. This means that the companies do not necessarily have the greater public’s interest

Environmental Protection Information Center

145 G Street, Suite A, Arcata, CA 95521

(707) 822-7711

www.wildcalifornia.org

in mind when making decisions about energy. Local cooperative energy authorities should be analyzed to determine whether local decision making by a publicly-run utility would result in better results in terms of renewable energy and community support. For example, Redwood Coast Energy Authority could take the lead in challenging PG&E on local decision making over energy and distribution. Smaller communities throughout Humboldt could also benefit from such change in structure.

Cape Mendocino Wind Energy Development

The Draft Plan identifies developing industrial scale wind turbines in the Cape Mendocino area as a high priority. We have significant concerns over the operation of industry-standard wind turbines in the Cape Mendocino area and other parts of the county where wind resource maps identify potential development. Cape Mendocino Grasslands is identified as an Important Bird Area by the Audubon Society and for many species, including Golden Eagles, it is the only location that they can be consistently found within Humboldt County. Birds and bats are particularly vulnerable to collision with wind turbines, and preliminary studies conducted for the Royal Dutch Shell subsidiary, Shell Wind Energy, have consistently shown significant risks. For instance, researchers have revealed that critically imperiled Marbled Murrelets that nest in protected old-growth forests on private lands and state parks within the Eel River watershed utilize the ridges and valleys along Cape Mendocino for commuting between nest sites and feeding areas in the near shore marine zone. Based on the importance of Bear River Ridge for murrelets, the U.S. Fish and Wildlife Service would have required Royal Dutch Shell to acquire an Incidental Take Permit under the Endangered Species Act. This is an extraordinary measure reserved for projects that threaten the continued existence of endangered species. Clearly, a renewable energy project by definition should never require a permit to kill endangered species. In addition, several grassland bird species that are only found in the Cape Mendocino area on the North Coast of California. Bats are poorly studied in the Cape Mendocino area, but preliminary work indicates that wind turbines would cause significant mortality. We look forward to developing guidelines for properly siting such industrial scale facilities away from sensitive areas. A resource that the Draft Plan should incorporate is the American Bird Conservancy's Bird Smart Guidelines¹ that emphasize a process for avoiding conflict between wind turbines and wildlife. As the guidelines note, after weighing the threats and conflicts, it follows that some areas are not going to be suitable for wind energy development. We remain very skeptical that industry-standard wind turbines could be installed on

Expanding biomass

The Draft Plan relies very heavily on the expansion of biomass burning to meet energy needs. There is significant information in recent published literature that leads to the conclusion that burning biomass is just as bad or possibly worse, in climate change terms, than burning fossil fuels. We have attached several recent research articles published in peer review journals that inform the biomass question. While there may be some limited applications for new technologies, like pyrolysis and biochar, these are very different from large-scale biomass burning for energy delivery to the grid. We ask that your organizations review the articles that we submit with our comments, and respond to the conclusion therein.

¹ http://www.abcbirds.org/abcprograms/policy/collisions/wind_policy.html

Furthermore, because a switch to more renewable energy sources is primarily driven by a concern over climate change, it is important to take into account the contribution of our local forests to mitigating climate change. Deforestation and continued forest degradation through timber harvest is having an ongoing impact on our region's forests, and their ability to mitigate for climate change. In the context of biomass energy, it is important to ensure that timber and biomass harvest is not undermining the ability of our region's forests to sequester carbon. In the redwoods this is particularly true given that the species can live for thousands of years and creates rot resistant heartwood that can last many thousands of years. Indeed, while harvesting more biomass may well be possible, it may not actually pencil out in the context of climate change because standing forests would outweigh the burning through increased sequestration of carbon.

Sincerely,

Andrew Orahoske
Conservation Director

Environmental Protection Information Center
145 G Street, Suite A
Arcata, California 95521
Office: (707) 822-7711

**Links to research articles submitted as part of public comment by Andrew Orahoske,
Conservation Director, Environmental Protection Information Center**

Campbell, J.L., M.E. Harmon, and S.R. Mitchell, Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? *Front Ecol Environ*, 2011.

<http://scholarsarchive.library.oregonstate.edu/xmlui/bitstream/handle/1957/26174/CampbellJohn.Forestry.CanFuelReductionTreatments.pdf?sequence=1>

Clark, J., J. Sessions, O. Krankina, T. Maness, Impacts of Thinning on Carbon Stores in the PNW: A Plot Level Analysis, College of Forestry, Oregon State University, 25 May 2011.

http://switchboard.nrdc.org/blogs/ngreene/Impacts%20of%20Thinning%20on%20Carbon%20Stores%20in%20the%20PNW_Final%20Report.pdf

Hudiburg, T.W., et.al., Regional carbon dioxide implications of forest bioenergy production, *Nature Climate Change* 1, 419–423 (2011), Published online 23 October 2011.

<http://files.dnr.state.mn.us/forestry/biomass/carbondioxideImplicationsBioenergy.pdf>

Kirkland, J., Logging Debris Matters: Better Soil, Fewer Invasive Plants, *Science Findings*, Pacific Northwest Research Station, August 2012.

www.fs.fed.us/pnw/science/scifi145.pdf

Law, B.E., M.E. Harmon, Forest sector carbon management, measurement and verification, and discussion of policy related to climate change, *Carbon Management* (2011) 2(1), 73–84

<http://terraweb.forestry.oregonstate.edu/pubs/lawharmon2011.pdf>

Luyssaert, S., et. al., Old-growth forests as global carbon sinks, *NATURE*, Vol 455, 11 September 2008

<http://www.nature.com/nature/journal/v455/n7210/pdf/nature07276.pdf>

Meigs, G.W., et. al., Forest Fire Impacts on Carbon Uptake, Storage, and Emission: The Role of Burn Severity in the Eastern Cascades, Oregon, *Ecosystems* (2009) 12: 1246–1267

http://terraweb.forestry.oregonstate.edu/pubs2/Meigs_etal_2009_Ecosystems_FireCarbonMetolius.pdf

Nave, L.E., et. al., Harvest impacts on soil carbon storage in temperate forests, *Forest Ecology and Management* 259 (2010) 857–866

<http://soilslab.cfr.washington.edu/publications/Nave-etal-2010-SoilCarbon.pdf>

Schulze, E-D., Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral, *GCB Bioenergy* (2012).

<http://ncfp.files.wordpress.com/2012/04/biomass-energy-not-sustainable-or-carbon-neutral.pdf>

Turner, D.P., et. al., Decadal Trends in Net Ecosystem and Net Ecosystem Carbon Balance for a Regional Socioecological System, *Forest Ecology and Management* 262 (2011) 1318–1325

http://terraweb.forestry.oregonstate.edu/pubs/turner_2011.pdf

Carol Rische, Humboldt Bay Municipal Water District
September 24, 2012, via telephone, comments taken by Jim Zoellick

Requested that we add pressure retarded osmosis (PRO) power production as a potential local renewable energy resource.



James Zoellick <jiz1@humboldt.edu>

Comments on Draft "Re-Power Humboldt" Study

Roy Willis <rbwillisii@gmail.com>

Thu, Sep 27, 2012 at 10:29 AM

To: comments@redwoodenergy.org

Hi

I attended the meeting last night (9/26) for the review of the Re-Power Humboldt Study. Thank you for the opportunity to participate in this process. It was nice to see the attendees were engaged in the idea of Humboldt's generation future. And the process used during the meeting help focused the meeting on what the attendees felt should be important as Humboldt wrestler with the idea of electrical independence.

First I have been involved in electrical generation for over 30 years and have dealt with public concerns and perspectives around generation issues directly for the last 20 years here in Humboldt County. This community has a growing active/vocal minority and somewhat passive following majority. Examples are like the community response to DG Energy Solutions proposal (if I recall correctly) for the Tri-Renewable Energy Generation Program for wind and wave generation on the Samoa Peninsula, adding 20 MW wind and 20 MW wave to the Fairhaven's 17.5 MW Biomass. A valid proposal or not there was no real public momentum and as I recall the DG Energy ask for County financial support was not there. Than there was the Liquefied Natural Gas dock and I think a 5000 MW generation facility. Which prompted the public meeting that filled the room at the vets hall and pushed those investors out of the county. Ultapower's attempt to burn tires so they could continue to operate and stay in business was met with strong opposition. Shell Wind and Wave Connect are also examples where there are great ideas that seem to have the support but for some reason can't survive the economics, push of public concerns or sound technical decision making. So I am sure you can see the challenges of any major quick changes/proposals to BAU.

Second, at the meeting last night there seem to be a strong push for the Peak scenario. The need to focus on what might be achievable and a concern with not shooting high enough to really make a difference was the major debate at my table. We did agree on the 3 key strategies and the fact that Efficiency Improvements was missing from the list of 9. We agreed the Efficiency Improvement must be the number one priority and really could not understand why the difference of how Efficiency was reflected in the Bold verse the Peak scenarios. The three that follow efficiency were; Distributed Generation, because over the next 20 years and local ordnances requiring some type of gen capacity for industries or large residences can and is happening, Bio-Mass because of the present capacity of our forests and the existing logging infrastructure, and Wind (on or off shore) because it is a proven technology and Humboldt has the wind energy potential.

A few comments on the study;

7.1 Biomass; the present Biomass capacity on the books are just over 63 MW. In reality actual generation form the three existing aging facilities is far less. Fairhaven's reliability is a question and there ability actually operate at capacity is sometimes limited. UltraPower in Blue lake under contract with SDG&E does not have a strong generation profile and Scotia because they are a CoGen are only available for around 3 MW to the grid not 30 MW (However good Distributed Gen). So BAU is not seeing 30% BioMass generation in the area but more like 10 to 15%. Also there is no real discussion about the other emissions from burning of hydro carbons, NOx and PM10 and PM2.5 which are real issues that the ARB will have concerns about as well as the community.

Williams 2008 reference 220 MW BioMass capacity but at the end of the paragraph you say the maximum capacity is 225 MW. Not sure if you meant to show two different numbers.

7.2; The introduction of the 5% increase for Bold and the 15% for Peak. Do these increases include the required transmission infrastructure upgrades and maintenance? In 7.3 page 27 you outline a PG&E estimate of \$260

million for transmission upgrades and in foot note 13 state to real cost are not known. My concern is potentially understating the possible cost increase of Bold and Peak.

Figure 3 page 21; Some where you need to explain why the Efficiency improvements in Bold are so far less the in Peak. Outline the basis for the percentages.

Foot Note 12 on page 22; This information should be in the text not a foot note.

Figure 12 page 28. Can you also display BAU and Bold in the same format for a comparison?

Page 37 IM5; You discuss how no new MW scale Hydro power facilities in the county for two decades. This really does not reflect the difficulty of licensing a hydro plant. A better representation would be the fact that no new hydro facilities have been permitted in the whole state of California in the past 20 years. Also just the re-licensing process of existing hydro plants takes decades.

You discuss the ties of the transmission system to the rest of the electric grid. There are two 115 kv transmission lines that run to the Cottonwood substation near Red Bluff. These are the only transmission lines capable of importing power into the Humboldt area. There are also two 60 kv lines that run South to the Willits area but these are for distribution only and are not capable of importing or exporting power to Humboldt.

There is discussion about the possibility of exporting power from Humboldt. This is very rare and not a normal operation. Before you outline this possibility you should get a better understanding of the system limitations and the CAISO expectations/requirements.

Thank you for the opportunity to comment.

Roy Willis

----- Forwarded message -----

From: **Mike Wilson** <mwilson@humboldt1.com>

Date: Fri, Sep 28, 2012 at 5:28 PM

Subject: Re: More info please

To: James.Zoellick@humboldt.edu, colin@humboldt.edu

Cc: Richard.Engel@humboldt.edu, Jack Crider <jcrider@portofhumboltdbay.org>

I think now is the time to push for that kind of relationship. There are properties and assets in the Samoa Peninsula area that would really help this along. I believe that a partnership between HSU (and Oregon State), the Harbor District and some of the landowners could really be beneficial. DG Power, California Redwood and Freshwater Tissue all have assets and/or potential products of interest. Land is cheap now. No better time than the present.

Mike

On 9/28/12 4:54 PM, "James I. Zoellick" <James.Zoellick@humboldt.edu> wrote:

Hi All,

I agree with Colin's assessment. I don't think the Eco Wave Power devices are well suited to our marine environment. But thanks for sending this our way, Mike. We would love to help get a wave energy project going here in Humboldt. We have an optimal wave resource, port infrastructure, and electrical transmission and distribution infrastructure to support this industry, as well as a supportive community and knowledgeable local energy professionals and researchers who can help support such a project.

Colin and I have dreamed about developing a partnership between HSU (SERC, engineering, oceanography, etc.) and Oregon State (see: <http://nnmrec.oregonstate.edu/>) and getting wave energy research and demonstration going here in Humboldt. It would take some substantial work to make this happen, but I think it would be a good fit for our university and our community with many benefits.

Please keep us in the loop if more opportunities like this present themselves.

Cheers!

Jim

Jim Zoellick
Senior Research Engineer
Schatz Energy Research Center
Humboldt State University
Arcata, CA 95521
[707-826-4350](tel:707-826-4350)
jimz@humboldt.edu

www.schatzlab.org <<http://www.schatzlab.org>>

On Tue, Sep 25, 2012 at 12:05 PM, Colin Sheppard <colin@humboldt.edu> wrote:

Hi Mike, my initial impression of this technology is that it would not be well suited for our region. We have very little in the way of ocean front breakwaters where these kinds of devices are designed to be installed.

The jetties are essentially the only place where a man-made structure interfaces directly with the ocean (Trinidad harbor would be another exception, but it's mostly protected from waves). The jetties regularly experience 40-50ft waves every winter, one of the most hostile environments imaginable for an energy production system.

I did meet with the CEO of Atmocean last week (<http://atmocean.com/>). Their technology is still in the prototype phase, but would involve off-shore devices which is more appropriate to our wave regime and coastal infrastructure. We may end up doing some research for Atmocean, but their device needs a substantial amount of additional development and testing before we'd consider it a commercially mature and viable technology.

Our RePower Humboldt strategic plan (<http://www.redwoodenergy.org/programs/repower>) makes the following long-term and near-term recommendations around wave power. We'd love to get your feedback on these points (and on the rest of the plan if possible).

Long Term Strategy 8. Work to develop Humboldt County as a center for wave energy and offshore wind energy research and demonstration

Humboldt County is uniquely positioned to play a critical role in the early adoption of wave energy and off- shore wind energy resources in California. In addition to vast offshore resources, the county has electrical grid and marine infrastructure that can support development of these technologies. The community should promote and support wave and offshore wind energy research, assessment and demonstration projects.

Implementation Measure 17. Reach out to wave energy research organizations (LTS8)

The Pacific Northwest has become the center for re- search and development of hydrokinetic technologies (including wave energy and tidal energy conversion) in North America. Significant funding and support for hydrokinetic research has been secured at Oregon State University (OSU) and Washington State University (WSU), which have become the lead research arms of the U.S. Department of Energy National Marine Renew- able Energy Center.

Although wave energy research in California has been very modest to date, Humboldt County will likely be among the first regions in California where commercial scale development occurs. Humboldt County has a huge wave resource, as well as a deep-water port and an electrical grid infrastructure that can support wave energy development. For these reasons it would be prudent for Humboldt County to position itself early as California's center for research, development and demonstration.

PG&E's recently suspended Humboldt WaveConnect Project was a good example of the type of pilot scale project that could be developed here in Humboldt. In addition, The Humboldt State University Oceanography and Environmental Resources Engineering Departments would be a natural fit for this topic area and should consider incorporating ocean energy into their curriculum, conducting research, and forging professional bonds with OSU and WSU. A working group should be formed to promote Humboldt County as a prime location for wave energy research, development and demonstration.

Thanks,
Colin

Colin Sheppard
Research Engineer,

Schatz Energy Research Center
colin@humboldt.edu

On Tue, Sep 25, 2012 at 11:00 AM, Richard A. Engel <Richard.Engel@humboldt.edu> wrote:

Hi Mike,

Thanks. I'll pass this on to Colin Sheppard and Jim Zoellick here at Schatz. They've been the main people behind our RePower Humboldt collaboration with Redwood Coast Energy Authority, and Colin just met last week with a salesman from another wave power startup.

Jim and Colin, Mike Wilson is a commissioner for the Humboldt Bay Harbor, Recreation and Conservation District, and he's interested in wave energy. You and Matthew might like to talk with him at some point.

Richard

On Mon, Sep 24, 2012 at 1:05 PM, Mike Wilson <mwilson@humboldt1.com> wrote:

fyi

----- Forwarded Message

From: Eco Wave Power <info@ecowavepower.com <<http://info@ecowavepower.com>> >

Date: Sun, 23 Sep 2012 21:51:23 +0200

To: Mike <mwilson@humboldt1.com <<http://mwilson@humboldt1.com>> >

Subject: RE: More info please

Dear Mike,

We have wanted to update you that on the 27th of September Eco Wave Power will be participating in the Frost & Sullivan Award Ceremony in London, where we will receive the Best Practice Award, for best product in the wave energy field.

Attached please find the Award-Write up, provided to us by Frost & Sullivan.

In addition, this month we were chosen by Eco Sociable Magazine as one of this month's ecoFACES based on EWP's impressive contributions to promoting a sustainable economy. Past ecoFACES include Harish Hande, Lester R. Brown and Dr. Anna Jones-Crabtree.

Please read the full article :

<http://ecosociable.com/642/david-leb-of-eco-wave-power-on-cities-powered-by-wave-energy/>
<<http://ecosociable.com/642/david-leb-of-eco-wave-power-on-cities-powered-by-wave-energy/>>

As you can see, Eco Wave Power is recognized worldwide as a leader in the wave energy field.

As a result, we believe that it is the best time to discuss the cooperation between us.

Please let us know if you would like ask to plan a visit at your port during our visit to the UK.

Thank you in advance,

Kind Regards

David Leb,

Founder and CEO, Eco Wave Power

Herzeliyah Pituah, Israel

Office Phone: [+972-54-321-9276](tel:+972-54-321-9276) <tel:%2B972-54-321-9276>

Email: info@ecowavepower.com <<http://info@ecowavepower.com>>

Website: www.ecowavepower.com
<<http://www.ecowavepower.com>> <<http://www.ecowavepower.com>>



James Zoellick <jiz1@humboldt.edu>

RePower Stakeholder Email

Michael Winkler <mlwinkle@yahoo.com>

Sun, Sep 23, 2012 at 4:26 PM

Reply-To: Michael Winkler <mlwinkle@yahoo.com>

To: "James.Zoellick@humboldt.edu" <James.Zoellick@humboldt.edu>

Cc: "comments@redwoodenergy.org" <comments@redwoodenergy.org>

Jim,

I have read the entire report cover to cover.

Good job analyzing and modeling our energy situation in Humboldt County and with good long-term recommendations.

Some areas that I would suggest adding to the report are the following:

- **Examples to Illustrate Recommendations**

- I think it would add clarity to add specific examples for many of your recommendations. It is often much easier for people to understand a concept using examples.

- Switching from Natural Gas to Heat Pumps (LTS5) - You could use the quantitative, model results that I developed in EnergyPro for the two Danco local Danco projects, Plaza Point in Arcata and Aster Place or measured results for my house
- Flip Model for Financing (P. 56) - You could describe a specific project in Minnesota that used this model and cite actual dollar amounts.
- Increased Energy Efficiency Standard for New Construction (LTS2, IM4) - You could cite a specific ordinance in a specific city where they did this.
- And Many More

- **Links to Outside Information Sources**

- I suggest that you add many of these to the report

- **Smart Grid and Meters/Dynmic ElectricityPricing (Time-of-Use, Real-Time)**

- PG&E is spending more than a billion dollars to implement a smart grid and smart meters. They have recently mandated time-of-use rates for all commercial and industrial customers. The smart grid and smart meters will support a long-term shift for virtually customers to have time-dependent rates. In the future the value of generation and the cost of consumption will be time dependent. For instance, biomass electricity generation that is **load following** will have a significantly higher value per kwh than biomass generation that is run as baseload. Demand-responsive loads and loads that incorporate thermal storage to do permanent load shifting would allow customer to use significantly lower cost electricity. The increasing use of time dependent pricing would substantially change the economics of various supply and demand options. Currently, my understanding is that rates are set uniformly throughout PG&E's service territory. In the future if we implemented our own CCA electric rates and their time dependency may be different for CCA customers than for customers who stay with PG&E. I suggest that

you include some discussion of these issues within you report.

- **New Humboldt Bay Power Plant as a Stranded, but Valuable Asset**
 - On P. 21 of the report in figure 3 the "Peak Scenario" bar graph shows approximately 3% of electricity generation coming from natural gas. Under this scenario the power plant would have a very low capacity factor. However, in this scenario the power plant still plays a very valuable role in filling in the gaps during times of low output from variable renewables. During these times electricity from the plant would have a very high value and should also command a very high price per kwh. We would need to make some long-term arrangement for fairly pricing energy produced by the plant and allowing PG&E to recover their investment in the plant.
- **Grid Upgrade and Expansion**
 - The report discussed needing an upgraded and expanded grid to support the RESCO scenarios. First, how would this expansion be financed and second, how would this expansion be paid for as part of electricity rates?
- **Demand Response**
 - I know what that this means, but I don't think most other readers would. Please add definition and example.
- **"LTS5. Adopt electric heat pumps for water and space heating"**
 - I would suggest changing this to "Adopt electric heat pumps for water and space heating, clothes drying and industrial process heating". Heat pump clothes dryers have been available in Europe and Asia for the past 5 years and should be available in the U.S. in the next year. Heat pump process heating is widely used throughout the world.
- **Electric Vehicles (charging issues, LST4, IM7-11)**
 - There are a number of issues related to electric vehicle charging. Residential off-peaking charging could potentially allow the vehicles to absorb and buffer the output of variable renewable energy sources such as wind and could increase utilization and cost-effectiveness of existing infrastructure. Daytime charging could potentially increase peak loading on the grid and require increased grid infrastructure to support it. I would suggest some discussion of these issues.
- **Biomass (load following)**
 - In the report it is implied, but not explicitly stated, that biomass electricity generation will be operated in baseload rather than load-following mode (example P. 26). I suggest that you briefly discuss the possibilities for new biomass plants to be load following, since this could increase the value of electricity produced and allow such plants to provide support for the the output of variable renewables, such as wind.
- **Percentage of Heat and Transportation from Renewables**
 - In Figure 2 on P. 21 for both the Peak and Bold scenarios, the bar graph shows 40% adoption for both heat pumps and plug-in electric vehicles. On P. 24 for the Bold scenario Figures 6 and 7 show 32% of heat energy from renewables and 13% of transportation energy from renewables. I don't understand how percentages in the figures on P. 21 and P. 24 relate.

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From: James I. Zoellick <James.Zoellick@humboldt.edu>

To: mlwinkle@yahoo.com

Sent: Friday, September 21, 2012 2:41 PM

Subject: Fwd: RePower Stakeholder Email

[Quoted text hidden]

Informal walk-in comments at RCEA
Per Matthew Marshall, RCEA Executive Director

1. One respondent commented that the RePower Humboldt Strategic Plan is interesting
2. A second respondent expressed interest in a financing program that would cover energy efficiency and renewable energy projects for residential applications.