Materials Submitted

At Meeting

The following public comments (up to and including the petition opposing biomass) were submitted at the October 24, 2019, RCEA Board of Directors meeting.

Public comment on agenda item 5.1- Comprehensive Action Plan for Energy

To: Redwood Coast Energy Authority Board of Directors

Estelle Fennell, RCEA Board Member Humboldt County
Dwight Miller, RCEA Board Member City of Trinidad
Michael Winkler, RCEA Board Chair, City of Arcata
Summer Daugherty, RCEA Board Member, City of Blue Lake
Austin Allison RCEA Vice Chair), City of Eureka
Robin Smith, RCEA Board Member, City of Ferndale
Dean Glaser, RCEA Board Member, City of Fortuna
Frank Wilson, RCEA Board Member, City of Rio Dell
Sheri Woo, RCEA Board Member, Humboldt Municipal Water District
Cc: Matthew Marshall, Executive Director RCEA

Testimony by Daniel Chandler, Ph.D[1].

Spoken testimony is in boldface.

As someone who has done research for forty years to test, evaluate or predict good policy—but someone new to the field of biomass—I believe there is an opportunity for RCEA to get out ahead of difficult decisions on biomass that will need to be taken when wind power makes local electricity available with much lower emissions.

I want to make two quick points, and then hope you will follow me in drawing from them two implications. Both points are made many places in the literature. I am quoting this source in particular because it was published in 2019 with authors from multiple countries. It is from the peer-reviewed journal called Global Change Biology (GCB) Bioenergy. The article is called, *Serious mismatches continue between science and policy in forest bioenergy.* [It is free online at: https://onlinelibrary.wiley.com/doi/full/10.1111/gcbb.12643]

Two facts:

> **Woody biomass contains less energy than coal** (bio- mass pellets 9.6–12.2 GJ/m^3; coal 18.4–23.8 GJ/m^3; IEABioenergy, 2017), **so that CO_2 emissions for the same energy output are higher [in biomass than in coal]** (110 kg CO_2/GJ for solid biomass, 94.6–96 kg CO_2/GJ for coals in IPCC, 2006).

Second fact:

> **When climate mitigation policies were being developed, the delay in achieving net reductions in emissions was left out of the regulations. However, the Paris Agreement now commits 'to pursue efforts to limit the temperature increase even further to 1.5°C'** (https:// unfccc.int/process-and-meetings/the-paris-agreement/ the-paris-agreement—accessed May 10, 2019). **Given that the** Intergovernmental Panel on

[1] Ph.D. in sociology from UC Berkeley, 1972. Since then Dr. Chandler has done policy-oriented research for the Assembly Office of Research, the County of Sacramento, and in conjunction with Lewin Associates, and the California Institute for Behavioral Health Solutions.

> Climate Change **(IPCC**, 2018) **projects that average surface temperatures are likely to exceed 1.5°C between 2030 and 2052 on current trends, payback periods of decades increase the risk of overshooting Paris Agreement targets. Even the shortest payback periods [for biomass] compare unfavourably with those of solar and wind which offer net CO_2 emission savings within months to a few years** (Marimuthu & Kirubakaran, 2013).

The first implication is that the CAPE plan should build in flexibility about biomass. Biomass is obviously needed now. How much will it be needed in five years or ten years if the Terra Gen wind farm is implemented? We don't know. So please don't overcommit.

The second implication, is that while burning is the worst use of mill waste because the greenhouse gas emissions go directly into the atmosphere, there will need to be a transition to a better way of using mill waste in which carbon is sequestered for long periods of time.

So my suggestion is that the Board instruct the RCEA staff to use the next three to five years to obtain a Life Cycle Assessment of the greenhouse gas emissions of alternative uses of mill waste. These should include burning for electricity, composting, recycling into new products, and gasification and biochar. We are lucky to have Schatz Energy Research Center in our community. Using existing RCEA consultant funds they could do a preliminary study that includes developing the kind of detail that would be necessary to put into an RFP for a full-fledged study.

Both these actions have minimal costs but a big potential for reducing large amounts of greenhouse gases in the critical next thirty years.

Thank you for considering these suggestions

From:	EnergyPlan2019@RedwoodEnergy.org
To:	Lori Taketa
Subject:	FW: Addendum to comments submitted to RCEA Board of Directors October 24, 2019
Date:	Tuesday, October 29, 2019 12:05:45 PM
Attachments:	Addendum to RCEA Board testimony.docx

From: Daniel Chandler [redacted]
Sent: Monday, October 28, 2019 9:17 PM
To: EnergyPlan2019@RedwoodEnergy.org
Subject: Addendum to comments submitted to RCEA Board of Directors October 24, 2019

Please accept this addendum to the short presentation I made to the Board on the 24th. It includes other points that were not possible to fit into the oral comment format. There is also tangential overlap with comments made to the RCEA Community Advisory Board. All comments pertain to biomass energy.

Again, thank you very much for your very open planning process.

Dan Chandler

Daniel Chandler, Ph.D.
Research and Evaluation Consultant
[redacted]

Addendum to statement on biomass submitted October 24, 2019 to RCEA Board of Directors

Submitted by Daniel Chandler, Ph.D.

Context

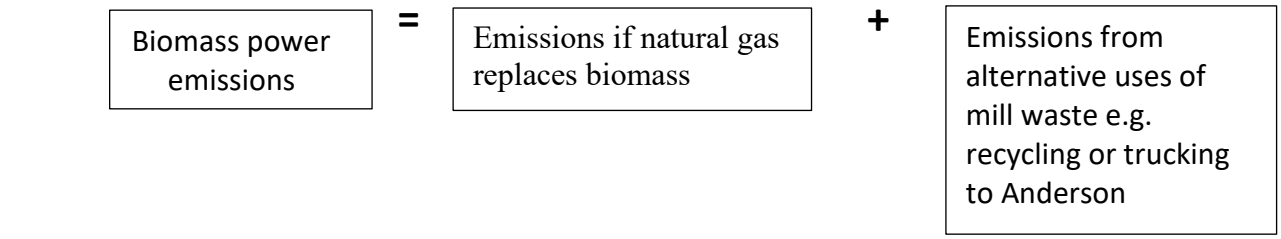
1. The RCEA Board has committed itself to 100% clean and renewable energy by 2025. Biomass energy from burning mill wastes is not "clean" or, in a scientific sense, renewable (carbon neutral).
    a. Humboldt County's biomass plants are among the county's top stationary sources of air pollution. Data from 2014 through 2017 (the latest) are shown in below, as is comparable data from the PG&E Humboldt Bay Generating Station. The maximum metric tons of greenhouse gases emitted in any of these four years for each stationary source was:

        DG Fairhaven: 230,000
        Humboldt Sawmill: 235,500
        PG&E Humboldt Bay: 199,500

        However, due to plant closures at both sites, it has been highly variable by year over these four years.
    b. The power plants in Humboldt are classed by the state as providing "renewable" energy. The Scotia plant also provides steam to an adjacent sawmill. Although mill wastes and other "feedstock" used in biomass power come from forestry many scientists argue that the emissions and sequestration of GHG must be calculated separately for the biomass generation of energy, not incorporated into the overall equations of sustainable forest management. This would mean the emissions from biomass energy are not carbon neutral and not renewable. The mills have no independent way of sequestering carbon, and trees planted as part of sustainable forestry do not offset mill wastes.[1]

[1] This is a fraught issue and elements continue to be controversial. While fossil fuels by definition are not renewable, the EPA under Trump has announced that by definition biomass is carbon neutral. The policy seems designed to further the biomass industry as do California biomass policies. But the fact that European energy plants that burn wood pellets are also officially considered carbon neutral has become something of a scandal. (Booth, Mary. 2018. Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy. Environmental Research Letters; Millward-Hopkins, J., & Purnell, P. 2019. Circulating blame in the circular economy: The case of wood-waste biofuels and coal ash. Energy Policy, 129, 168 - 172. doi:https://doi.org/10.1016/j.enpol.2019.02.019) Locally, the Humboldt Climate Action Plan does not classify emissions from biomass power as emissions because the state has the official position that biomass is carbon neutral. (email from Conor McGuigan of the Humboldt County Planning Department). The preferred method of studying emissions and sequestration is Life Cycle Assessment. In general, it proceeds from the basis that if a secondary use (in this case burning mill wastes) provides more than 1% of the total market value it should be analyzed separately. In this case, that means the mill waste cannot ride the coat tails of forest management. (Millward-Hopkins, ibid.). This is not academic because the method of accounting for carbon, that is whether it is deemed neutral, in biomass analyses has a large effect on the GHC impact of alternatives. (Morris, J. 2017, Recycle, Bury, or Burn Wood Waste Biomass?: LCA Answer Depends on Carbon Accounting, Emissions Controls, Displaced Fuels, and Impact Costs. Journal of Industrial Ecology, 21: 844-856. doi:10.1111/jiec.12469) See the first figure in Appendix 2 of this document to understand how much difference the assumption makes. While burning of some waste, e.g. construction debris of clean milled wood, has been studied mill wastes such as used in Humboldt has not yet received a Life Cycle Assessment. (One torrefaction option was

As a consequence, the desirability of biomass power with regard to greenhouse gas emissions becomes one of how much greenhouse gases would be released if the waste were *not* being burned for electrical energy.[2] There is no perfect solution, but the diagram below shows the equation we have to solve. We could replace biomass power (with natural gas) tomorrow but the emissions from mill waste do not just disappear. Unfortunately there are not now Life Cycle Assessments that would allow us to fill in these boxes reliably.



Conservation and controlled peak use would reduce emissions used to generate electricity, but don't change the equation: mill waste emissions still go somewhere.

studied in 2014 in a HSU Master's Thesis: http://humboldt-dspace.calstate.edu/handle/10211.3/123998. The preliminary finding was that "timber harvest waste" emitted less GHG if torrified and then used as an alternative to coal in coal-burning power plants.)

[2] The main existing options are putting the waste in landfills to the extent this is compatible with the law (and perhaps capturing some of the methane released), composting, several types of gasification (which can be captured while producing residues, like charcoal, which can be used for fuel or soil amendment), or reuse/recycle such as in particle board or pet bedding. At one plant, the steam used to generate electricity is also used to dry wood. So loss of a market for the electricity could conceivably not result in reduced emissions if the plant is still run for wood drying. All of these options have a net impact on GHG emissions. In 2017, John Anderson, director of forest policy at Mendocino Redwood Co/Humboldt Redwood Company said that HRC would sell most waste as a soil amendment, animal bedding, or similar use if not burning it to create electricity. See the white paper by Katy Gurin, Colin Fiske and Greg Gaiera, 'Biomass Energy in Humboldt County, available at https://world.350.org/humboldt/campaigns/local-clean-energy/

Proposed Recommendation[3]

Since a scientific answer regarding the environmental impact of alternative uses of mill waste is not yet clear, *350 Humboldt urges RCEA to contract with an energy analysis firm for a life cycle assessment of the use of mill wastes and other raw biomass for electricity generation in Humboldt County.*[4] Ideally, RCEA would seek supplementary funding so that the analysis would cover all 34 powerplants[5] in California that burn biomass for electricity.

Note that if RCEA decides biomass power can be replaced by 2025 with clean and renewable power from another energy source this study is not needed. An example of the kind of study that would be useful is in Appendix 1, although it focused on construction waste rather than mill waste.

To be clear, since we need a study to fill in the values for GHG emissions in the chart above, it is not possible to scientifically advocate for either supporting biomass electricity or opposing it at this point. However, there are a number of proposals that might increase our knowledge or move us toward clean and renewable electricity that stop short of advocacy either direction. For convenience some of these are listed below. These, and perhaps others, would all be compatible with the primary recommendation that RCEA have an LCA study completed.

Related Recommendations

- Wendy Ring has pointed out that the source or amount of local peak energy need not be assumed to be fixed. The overall equation might be modified by writing into the CAPE plan that RCEA will investigate reducing the need for local peak power in ways similar to other communities using strategies that include reducing peak demand (peak shaving) with battery storage at large customers, shifting the time of electricity use by large customers by means of financial incentives, remote control of smart devices like electric water heaters and EV chargers to turn reduce power demand and even feed power into the grid at peak times, and planned increase of peak power conservation through energy efficiency. In the same vein, a Humboldt-only *Ohm Connect* could help conserve energy at peak hours. (The 150,000 Ohm Connect participants reduced power *this*

[3] This is not a new recommendation. The 2017 position paper by Gurin, Fiske and Gaiera mentioned earlier states: "RCEA should support ongoing research into the full life-cycle carbon impacts of local biomass power production and fund its own research if necessary. If other feasible modes of mill waste management show substantial greenhouse gas emissions savings over raw biomass incineration, or if research reveals other significant GHG impacts of local biomass power production, RCEA should phase out biomass from the CCE grid mix."

[4] A preliminary step could be contracting with Schatz Energy to do a literature review in order to clarify what is known and what needs additional data collection. This could be done by use of a non-competitive consultant contract: https://redwoodenergy.org/wp-content/uploads/2019/08/RFQ_19_601_Energy-Assessment_Professional-Services.pdf

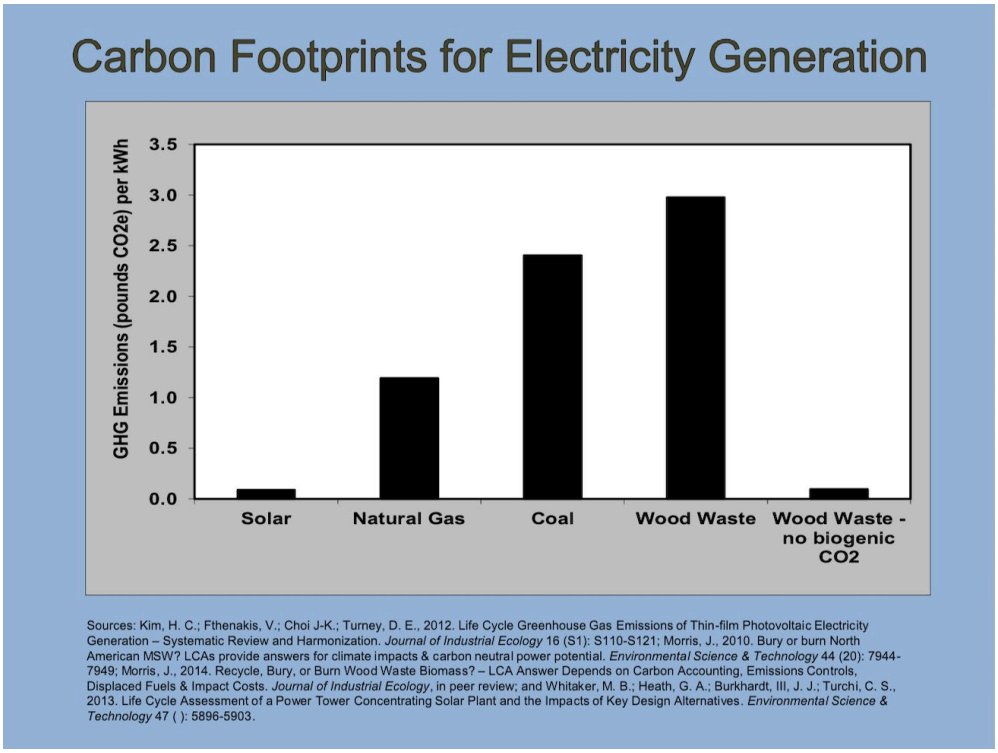
[5] http://www.calbiomass.org/facilities-map/

summer equivalent to shutting down four dirty power plants or planting 1.5 million trees.)

- EPIC has suggested removing any fixed megawatt target tied to local biomass. While the powerplant operators need some information to plan on, removing the fixed target would provide RCEA the flexibility it may need if an LCA study shows feasible lower GHG alternatives.

APPENDIX I

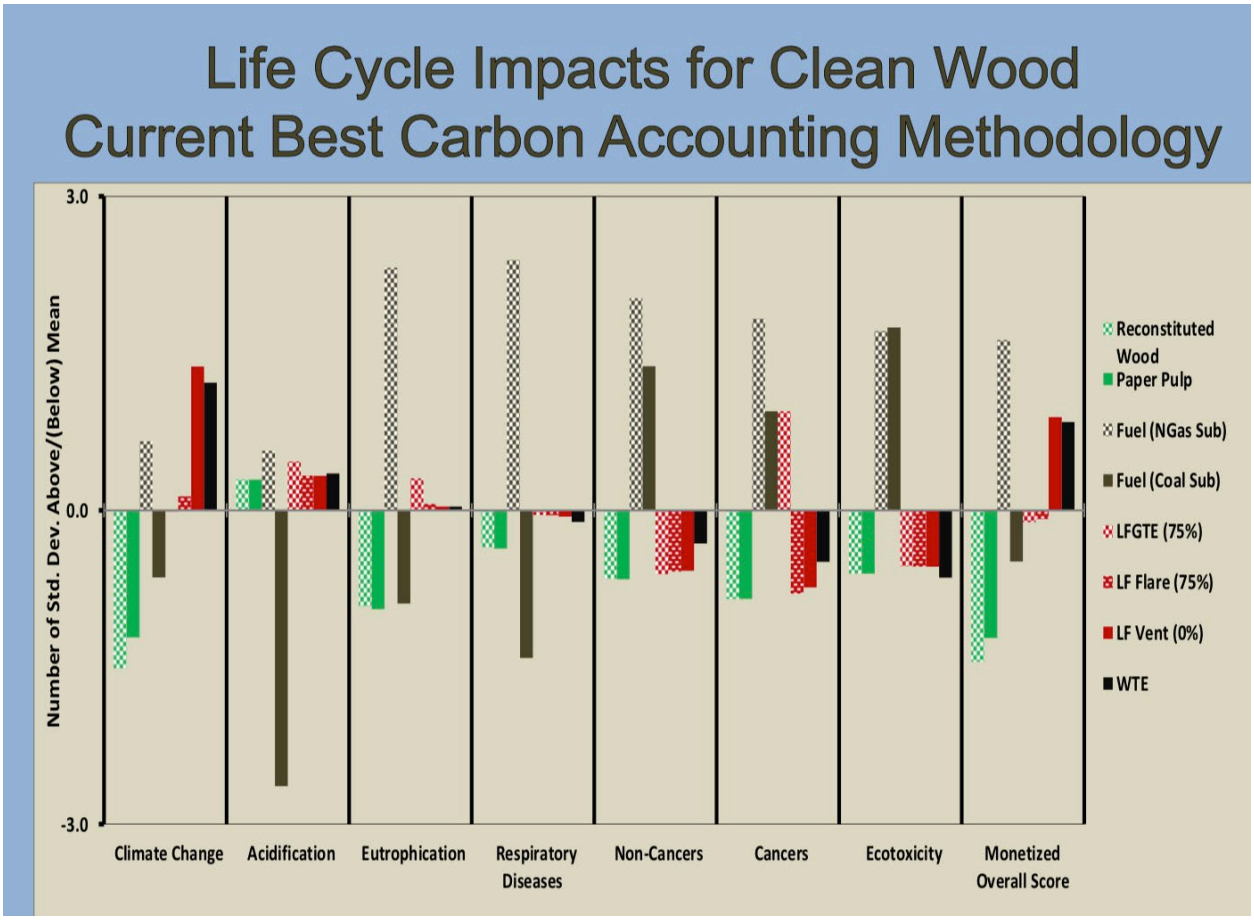
AN EXAMPLE LCA STUDY
Two graphs from Morris, J. 2017, Recycle, Bury, or Burn Wood Waste Biomass?: LCA Answer Depends on Carbon Accounting, Emissions Controls, Displaced Fuels, and Impact Costs. Journal of Industrial Ecology, 21: 844-856. doi:10.1111/jiec.12469



NOTE: Results in this study are shown to depend greatly on the carbon accounting method used. The "best" method shown below includes the assumption of biogenic CO^2. That is, emissions of CO^2 are attributed to the method of using waste wood rather than assuming CO^2 is neutral (just because it is not a fossil fuel). Morris gives several technical reasons for this assumption, but the most basic is that the environment is affected by the CO^2 emissions in the same way whether it is from fossil fuels or wood products.

The calculations in this article are for clean wood from construction or demolition sites, so the conclusions cannot be assumed to be true for mill

waste (according to the author in conversation with Wendy Ring). The graphs are shown as an illustration of what a well-done LCA that is based on mill wastes would look like. In the table below WTE stands for Waste to Energy (e.g. burning trash for energy) is included for comparison purposes.] [In the graph below being over the mean (above the midline) is a negative outcome. Recycling, which includes the first two methods, demonstrated a positive finding for all outcomes and substituting biomass power for natural gas demonstrated a negative finding for all outcomes.]



Eight management options are assessed: recycling into reconstituted wood products or papermaking pulp; combustion for heat energy displacing natural gas or coal; landfilling with 75% methane capture for electricity generation or flaring, or with zero methane capture; and waste-to-energy (WTE) facility combustion for electricity generation.

Author's conclusion: "Recycling (the first two or green options) ranks better than burying (land fill) or burning in the base case under two of the seven environmental burdens analyzed in this LCA, as well as for monetized overall score. Substitution of wood for coal in industrial boilers ranks first for the climate, third overall, and ahead of high CH4 capture rate landfill options. *Substitution of wood for natural gas in industrial boilers ranks at the bottom overall and for five of the seven environmental impacts.* For monetized score, WTE and landfilling without CH4 capture rank sixth and seventh, respectively, out of eight."

**As shown in the first graph of Appendix 1, results in this study are very sensitive to whether the biogenic CO^2 produced is attributed to the method or discounted, assuming that biogenic CO^2 is not possible.

For a copy of the Morris paper please ask Dan Chandler [redacted]

Thank you for the opportunity to express my opposition to biomass as an energy source. I urge the RCEA Board not to renew the current biomass contracts and not enter into any additional biomass contracts.

Biomass energy costs more than solar and wind energy as shown by the California Energy Commission diagrams and graphs comparing costs. Operation and maintenance of our biomass plants, which will be over 40 years old by 2030, costs more than operation and maintenance of solar and wind infrastructure. Solar and wind don't have fuel costs; biomass does. Biomass fuel cost can vary with unforeseen problems. Conflict in the Middle East can raise the price of diesel for biomass fuel transport. Economic recession can reduce the demand for lumber and the associated waste.

The timber industry already benefits from subsidies in the form of lower property tax rates and schedule T tax write offs for timber harvested. RCEA ratepayers should not have to provide an additional subsidy by paying the timber industry to get rid of the waste it generates. The Institute of Political Economics at Utah State University in the report *Reliability of Renewable Energy: Biomass*, states: "biomass subsidies increase the cost of electricity for tax payers [and rate payers] and redistribute wealth to biomass producers."

Regulation defines the level of damage allowed; it does not require no damage. Cleaner is not clean.
The judge who ruled on the consent decree EPA vs Blue Lake Power stated: "the reduction in carbon monoxide and nitrous oxides will provide pollution reduction benefits to the surrounding community." If/when the Blue Lake biomass plant starts up, the community will experience the "allowed amount of pollution". The Intergovernmental Panel on Climate Change discussion on atmospheric CO2 has no special category for biomass CO2. Carbon dioxide molecules have the same capacity to capture long wave radiation regardless of whether California labels them as biogenic or non-biogenic. The time required for carbon sequestration according to the IPPC is 50 to 500 years. A study that I submitted in Oct., 2016 from Oregon State University showed that, for a variety of timber thinning scenarios, more than 50 years were needed to sequester the equivalent amount of carbon that existed in the timber before harvest. A timber rotation time of less than 50 years contributes to atmospheric carbon totals.

10/24/2019 Walt Panicl

California Energy Comm.

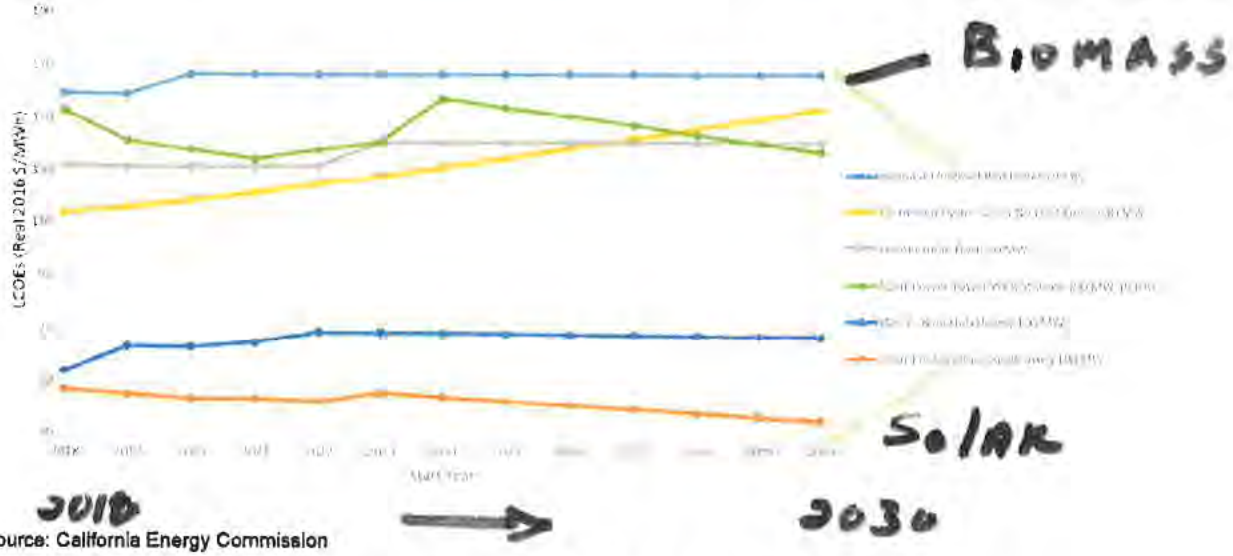
May 2019
Est. Mated Cost of New Utilities

power plants. In addition, the availability of incentives such as federal tax credits can also affect the cost of a particular technology and lower project financing costs.

Levelized Cost of Generation Estimates

Figure ES-1 shows the mid case levelized cost estimates for a selection of technologies studies in this report: biomass, combined cycle, geothermal flash, solar tower, wind, and solar PV (single axis). The mid case is as assessment of the cost that is most likely to occur. It is bounded by a high case and a low case, which use simultaneous highest cost and lowest cost factors.

Figure ES-1: Levelized Cost of Generation Estimates by Technology (Real 2016 $/MWh)



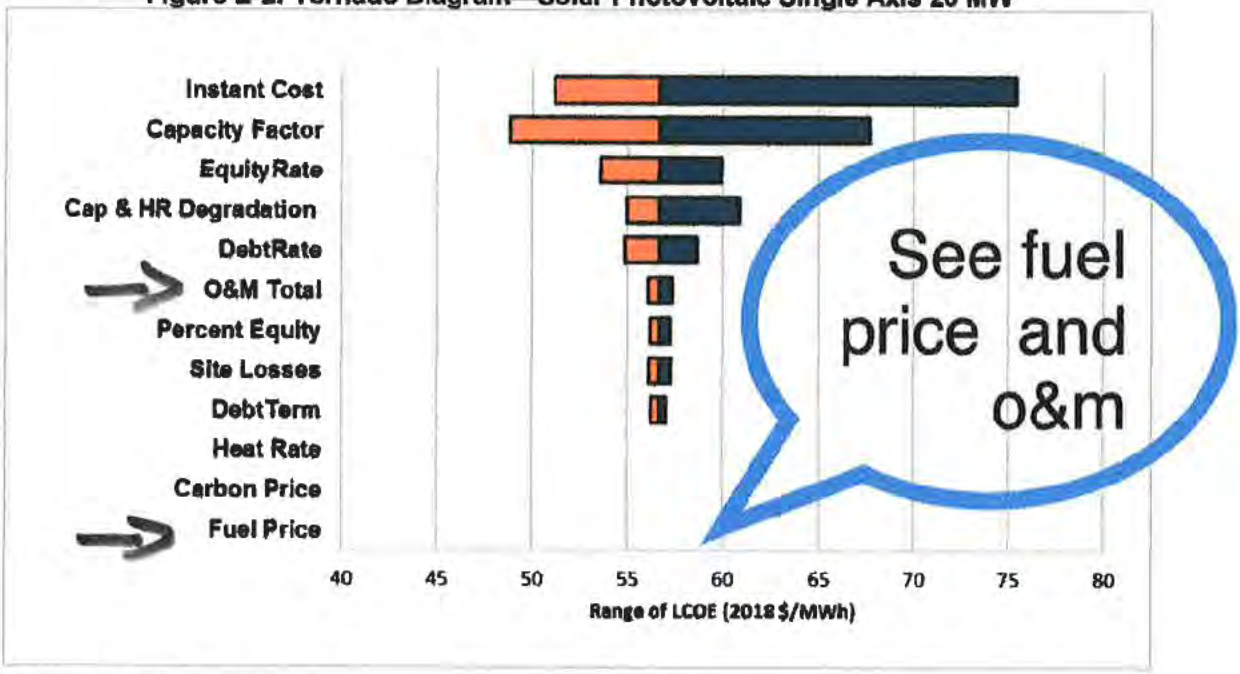
Source: California Energy Commission

Levelized cost estimates are lowest for solar PV, with the lowest of those being the 100 MW single axis type using crystal silicon technology, at $49 per MWh in 2018. Wind technology is most competitive before the expiration of the production tax credit, with an estimated levelized cost in 2018 of $54 per MWh. A traditional combined-cycle plant is estimated to have a levelized cost of $114 per MWh, while geothermal flash technology is $132 per MWh, solar power tower is $153 per MWh, and biomass is $159 per MWh.

Levelized Cost Trends and Implications

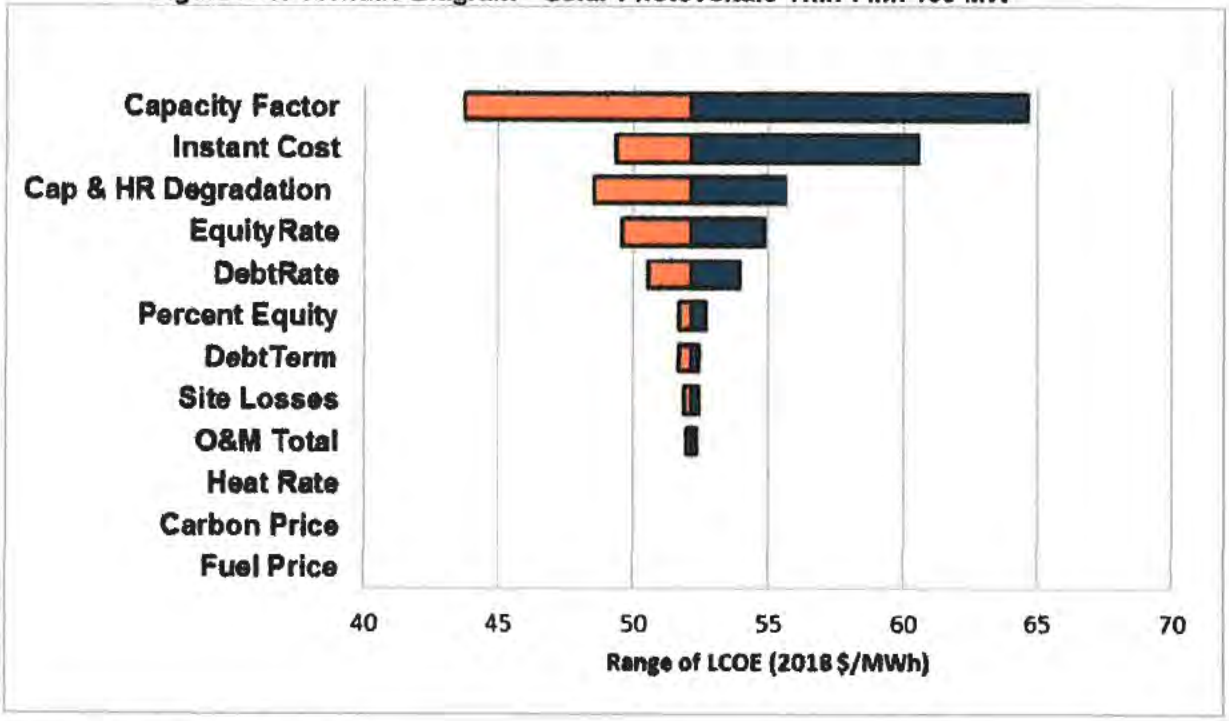
Solar PV has experienced dramatic price declines in recent years, exceeding previous estimates. While declining module costs have exhibited the largest cost decrease, inverters, other hardware, labor, overhead, and financing costs have all contributed to the cost decline. Tax credits were important in making solar PV more costs competitive and were a significant driver of development. The phaseout of this credit is expected to have only a temporary cost increase on solar PV projects as their levelized cost is anticipated to continue to decline. Solar PV is the least costly and most likely technology to be developed in California. The generation profile of solar resources poses challenges

Figure E-2: Tornado Diagram—Solar Photovoltaic Single Axis 20 MW



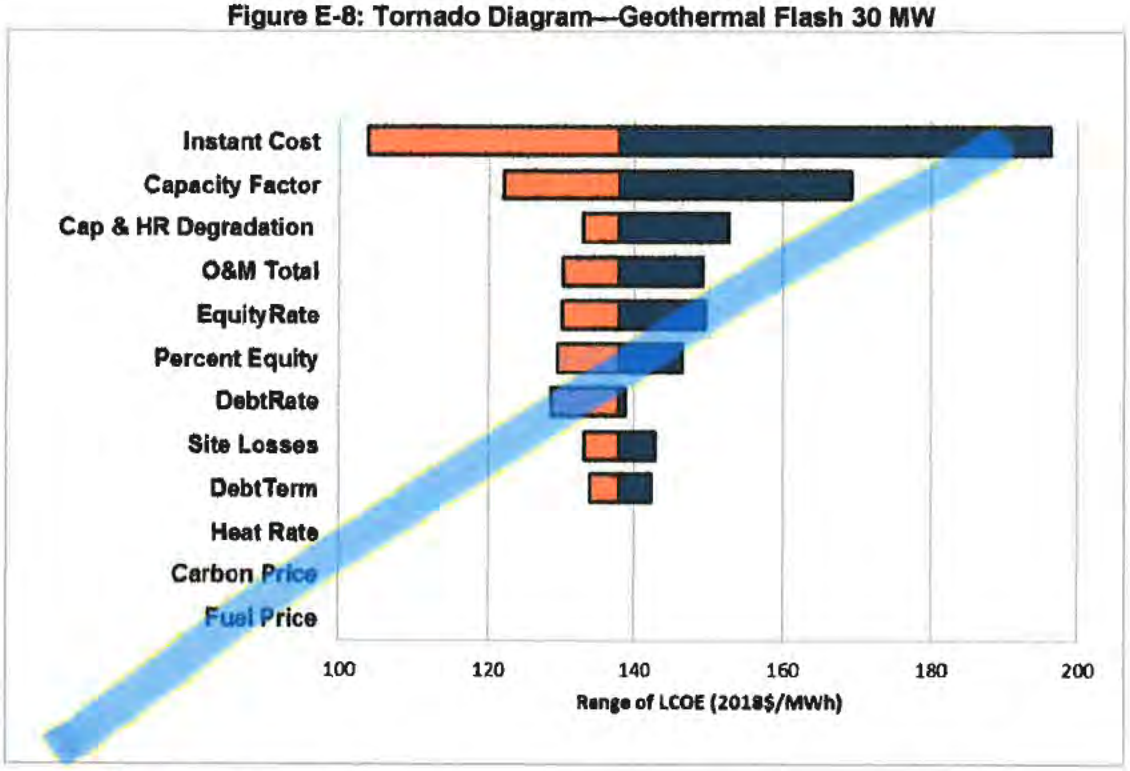
Source: California Energy Commission

Figure E-3: Tornado Diagram—Solar Photovoltaic Thin-Film 100 MW



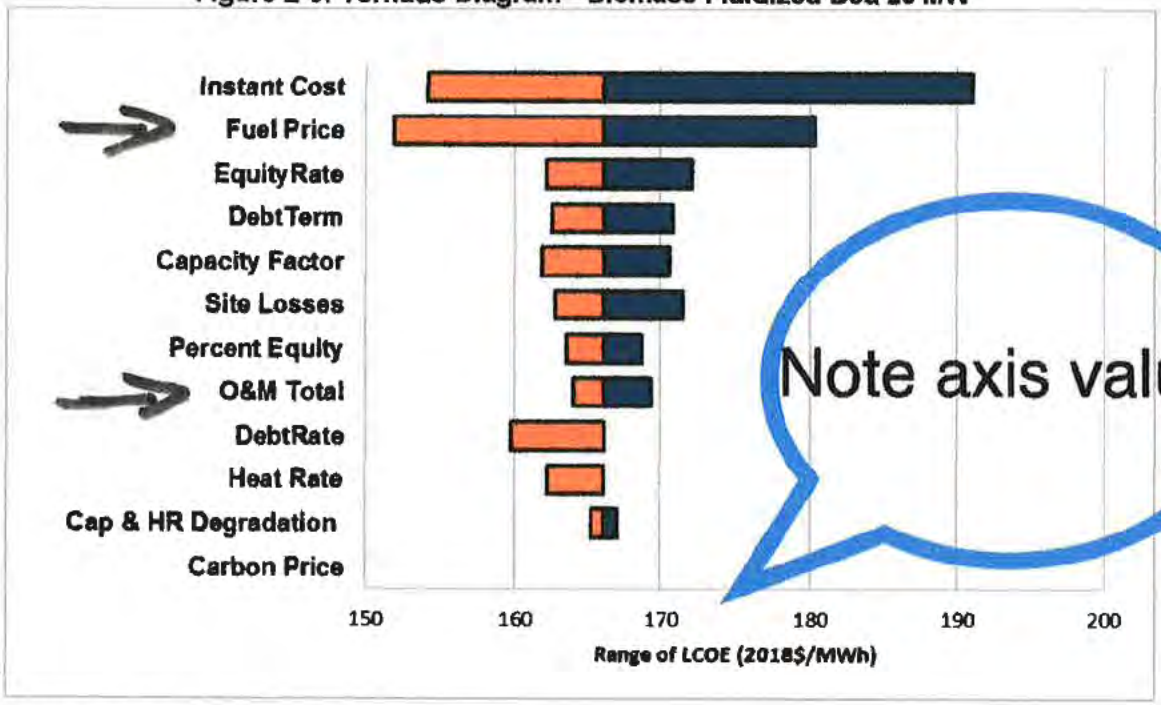
Source: California Energy Commission

Figure E-8: Tornado Diagram—Geothermal Flash 30 MW



Source: California Energy Commission

Figure E-9: Tornado Diagram—Biomass Fluidized Bed 20 MW



Source: California Energy Commission

Oct 24, 2019

Redwood Coast Energy Authority (RCEA) Board
633 3rd St
Eureka CA 95501

RE: Agenda 5.2, Wiyot Tribal Opposition to Terra Gen Wind Project and RCEA Support

He'bla'lo (Greetings) RCEA Board,

Thank you for giving the Wiyot Tribe the opportunity to speak regarding the fate of one of its most high prayer sites, at ***Tsakiyuwit***, or what we call today, Bear River Ridge and the Cape Mendocino ecological transect. We live in one of the most diverse landscapes in North America, in part because it was shaped and tended by Indigenous peoples, making Humboldt County and other parts of California a rich mosaic of vegetation types, which drives diversity and ecological stability. The proposed Terra Gen wind project, which RCEA appears to have blindly endorsed, is the aerial equivalent of damming up the Smith River, and will forever impact not just the spiritual connection of the Wiyot and other individuals, but the biology of this ecological transect. For example, survey efforts for the project found not just an array of artifacts, including Tuluwat barbed projectiles and plant processing tools, but verified the diversity of the area, identifying 81 different vegetation communities, with 38, or roughly 50% being rare or sensitive and even some newly described communities that may likely have ethnobotanical origin. The prairie system on ***Tsakiyuwit*** can be seen from outer space as one of the most intact coastal prairies in northwest California, rivaling Bald Hills in Redwood National Park. I would hope that RCEA wouldn't suggest putting a wind farm on Bald Hills, sacred land to the Yurok, so it's ok to put one on ***Tsakiyuwit***, out of site and mind from Eureka and Arcata, in a more rural part of the County with less resources to resist? We could go on and on about the biological and cultural impacts, and inadequate mitigations, not to mention the tons GHG's that it would be emitted during construction and maintenance and the 10,000 heavy truck trips in geologically unstable soils? And, as Wiyot elder Leona Wilkinson has said to the Terra Gen reps, "This is not your wind to take! This is the birds, the bats, the Earths, the the redwood tree's wind!" A recent study by Harvard revealed the truth that wind turbines really do affect the local mircro-climate and humidity, which may be devastating here, where complex interactions along our edge of the fog belt are critical to summer fog, our local biodiversity, and persistence of the redwoods.

Of equal impact to the wind turbines themselves, is the near 30 mile-long new transmission line corridor, continuing a swath of destruction, over 900 acres of forest to be cleared, along the ecological transect from coastal prairie through redwood, grand fir, Doug fir, and tanoak

forests, and finally to the oak woodlands and glades of Bridgeville. What will RCEA rate payers say when this new transmission line, in very remote timberlands, causes a wildfire that rips either into Pamplin Grove, Grizzly Creek, or Humboldt Redwoods State Park? How much carbon will be at increased risk of release through wildfire? Who will make the decision to de-energize these new lines when catastrophic wildlife conditions exist? RCEA, Terra Gen, Humboldt County? How can we make educated decisions on such maters when we haven't even seen the Final EIR? As a public trust agency, it is premature to give input or support for such a impactful project prior to release of the FEIR and the Tribe urges RCEA to reconsider its PPA with Terra Gen and abandon this project which would only contributes to vulnerable centralized grid-based power and more energy consumption. RCEA should be working toward investing in community solar micro-grids, like its project at the Arcata Airport, rather than giving money to a few wealthy corporate elites from out of the area.

Finally, given both the Wiyot Tribe's endorsement and RCEA's commitment to developing off-shore wind by 2025-2030 with a similar MW project, it is nothing less than criminal and ludicrous to develop ***Tsakiyuwit***, a premier cultural and biodiversity hot spot, and ignore the requests and wisdom of the Wiyot Tribe, who have been here since time immemorial. Impacts from off-shore wind are a fraction of the long lasting impacts we would see from developing ***Tsakiyuwit*** and the surrounding area. We ask the board to please reconsider and revoke its support and backing of the Terra Gen wind project and respect the Tribe's concerns and suggestions of working toward more truly resilient energy independence for Humboldt County. Thank you for your time and consideration.

Rra'dutwas (with kindness)

Adam N. Canter,
Tribal Botanist, GIS, and THPO Cultural Assistant
Table Bluff Reservation
1000 Wiyot Dr.
Loleta, CA 95551
adam@wiyot.us
707-733-5055

25
MD's

Petition

TELL REDWOOD COAST ENERGY AUTHORITY THAT BIOMASS IS NOT CLEAN ENERGY

We the undersigned residents of Humboldt County believe biomass from burning mill waste is not clean. It pollutes our air and emits far more greenhouse gases than replanted trees can absorb in the crucial next decade. Continuing to rely on biomass violates Redwood Coast Energy Authority's commitment to provide 100% clean renewable energy by 2025. **We call on RCEA to create a Comprehensive Energy Plan that will focus our resources on developing clean energy.**

NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Margarette Shegog	[redacted]	95540	[redacted]	[redacted]
Andrew Turner		95540		
W. M. HUNTER		95470		
Cartney Ladika		95503		
DEREK Stoke		95503		
ROBERT SOPER		95501		
Caroline Connor		95503		
Jean Argenzan		95519		
Ann Lindsay		95579		
Corinne Fugoni		95521		
Ma				

MD's

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Louise Minor	[redacted]	95570	[redacted]	[redacted]
Robert Fischer		95570		
Jon Lu		95561		
SPOUSE Kathy Sattler		95503		
Scott Sattler		95503		
LEI HAN		95503		
ALAN FISCHEL		95503		
John Mastroni		95501		
Marcella Mulgan		95519		
[illegible]		95521		
Stephan Bo[illegible]		95540		

M.Ds

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Rebecca Stauffer	[redacted]	95524	[redacted]	[redacted]
Sarah Sches		95519		
Tamara Dennis		95540		
Tom Ruiz		95503		
WENDY RUNS		95524		
KEN MILLER		95519		

SIGN ON TO 2 PAGES

23
FARMERS ✓

Petition

TELL REDWOOD COAST ENERGY AUTHORITY THAT BIOMASS IS NOT CLEAN ENERGY

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Carol Bridgeford	[redacted]	95503	[redacted]	Organic Matters
Autumn Rea		95521		FERAL FAMILY FARM
Jake Whiteley		95521		TRIDENT LIGHTNING
Dean Silkwood		95549		~~EARTH~~ N -
Chris Moore		95519		HANDS woody Ryno Farms
Margaret [illegible]		95556		PIERCE FAMILY FARM
Sara Keck		95521		REEDS EGGS
Maya Williams		95562		RIDGE FARM
Tasha James		95562		
Graham Coyne		95521		GREEN SPIRAL
River Walker		95558		Happy Hearts

FARMERS

Petition

TELL REDWOOD COAST ENERGY AUTHORITY THAT BIOMASS IS NOT CLEAN ENERGY

We the undersigned residents of Humboldt County believe biomass from burning mill waste is not clean. It pollutes our air and emits far more greenhouse gases than replanted trees can absorb in the crucial next decade. Continuing to rely on biomass violates Redwood Coast Energy Authority's commitment to provide 100% clean renewable energy by 2025. **We call on RCEA to create a Comprehensive Energy Plan that will focus our resources on developing clean energy.**

Print Name	Signature	Zip	E-mail	Phone
MATT MIKEL	[redacted]	95569	[redacted]	N/A FEISTY DOG ORCHARD
Mike Egan		95521		MYCALITY MUSHROOMS
Ellen Robinett		95503		SPRING HILL FARMSTEAD
Melanie Cunning		95528		Shakeforke Comm Farm
Spencer Hill		95546		SMALL FRUITS FROM
Andy Rigby		95570		TSUKA FAMILY FARM
Dan Stanley		95503		" "
Nancy Scott		95546		Quail Run Farm
[illegible]		95545		"
Kelsey Perone		95525		Rain Frog Farm
Amy Diekmeyer		95569		

FARMERS

Petition

TELL REDWOOD COAST ENERGY AUTHORITY THAT BIOMASS IS NOT CLEAN ENERGY

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Sean Armstrong	[redacted]	95521	[redacted]	TULE FOG [redacted]

Petition

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Print Name	Signature	Zip	E-mail	Phone
TOM Wheeler	[redacted]	95501	[redacted]	[redacted]
Chris Hall		95521		
Im Jewett		95503		
Susan Rochlin		95521		
JODITH STOVER		95521		
Emilie Lanning		95503		
Jayden Yarbrough		95521		
Cindy Barnes		95521		
Savanna Alves		95521		
Lucas Campbell		95521		

Petition

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
CONNOR CAVASSA	[redacted]	92025	[redacted]	[redacted]
Shane Keller		95525		
LINDA PETERSON		95525		
LAURA NOVELLA				
Lorenzo Fassi				
VALERIO AUTERI				
GEOFFREY ROBINSON		95525		
SARAH PETERS		95501		
JAMES FECK		95507		
OliviaBrock		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Ahiannon Miramontes	[redacted]	95501	[redacted]	
Gabrielle Smith		95503		
Andrew Knecht		95524		
Will Pratt		95521		
Kyrstie Obiso		95521		
Kennedy Fox		95524		
Justin Salazar		92082		
Jake Knoller		95521		
Israel Villarreal		95521		
Isaac West		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Julie M Ryan	[redacted]	95501	[redacted]	[redacted]
Jennie Brown		95570		
ADRIENNE OTTO		95501		
Carlotta Clark		95525		
Michelle Fuller		9554		
AMY LENNOX		95501		
Sharon Hafne		95503		
Denny Dorsett		95521		
Patricia Bender		95521		
Emerald Harder		95501		

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Print Name	Sign	Zip	Email	Phone
Jenny Finch	[redacted]	95503	[redacted]	[redacted]
Claire Perricol[illegible]	[redacted]	95501	[redacted]	[redacted]
Sylvia R Shaw	[redacted]	95521	[redacted]	[redacted]
Erik R[illegible]	[redacted]	95519	[redacted]	[redacted]
Nathaniel mc[illegible]	[redacted]	95521	[redacted]	[redacted]
Natasha Fischl	[redacted]	95561	[redacted]	[redacted]
Jeremy Hara	[redacted]	95501	[redacted]	[redacted]
Hayley Connors-Keit[illegible]	[redacted]	95519	[redacted]	[redacted]
Charles Shampe[illegible]	[redacted]	95524	[redacted]	[redacted]
			[redacted]	[redacted]

Petition

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
NAEMI MCCLAIR	[redacted]	95521	[redacted]	
Jonathan Mansfield		95521		
Alex Givens		95521		
Jule Coulter		95521		
Courtnie LaChaine		95521		
Kevin Vandenack		95521		
Eric Southard		95521		
Giovanni Taylor		95562		
Judi Rose		95524		

Petition

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Print name	Sign	Zip	Email	Phone
Tayler Martin	[redacted]	95501	[redacted]	
Hope Mu		95540		
Sean Rowe		95501		
Mark [illegible]		95503		
Nancy Ihara		95521		
John McGibbon		95501		
Brandi Solomon		95501		
Brandon Romero		95503		
Roxanne Hartmann		95501		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Forest Jurado	[redacted]	95525	[redacted]	
Angel Cortes		9552-		
Alex Galeone		95503		
Grace Stern		95519		
Sonia W.		95519		
Sean Steede		95521		
Gracinna Ortega		95501		
Rhett D.		95521		
Daniel Erb		95521		
Melanie Boyd		95570		
Krystal Master		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Emily Potter	[redacted]	95521	[redacted]	
Tridian Casere		95503		
ALEXANDRA CLIFFORD		95521		
Amanda Beeman		95501		
Alexandra Gonzalez		95521		
Patricia Bridgett		9554		
[illegible]		95880		
Teresa McGinnis		95503		
Sabina Ott		95521		
Mark Konkler		95501		
Tray Morgan		95519		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Kris Diamond	[redacted]	95521	[redacted]	[redacted]
Paul Culovich jr.		95570		
Kyler Conniga		95521		
Masha Gulak		95521		
Nora Mendoza		95521		
Alejandra V.		95521		
Alyssa P.		95518		
Emily Wik		95521		
Paulo Mat...		95521		
[illegible]		95521		
Sam Kempton-Hei		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Kylie Brown	[redacted]	95521	[redacted]	
Isabella Norton		95521		
Trent Johns		95521		
Skyler Minga		95521		
Taylor Reed		95521		
Lily Worthing		95521		
Fiona Flores		95521		
Carlos Vazquez		95521		
Valeria Pedroza		95521		
Rosemary Torres		95521		
John Chernoff		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Melanie Johnson	[redacted]	95542	[redacted]	
Maza Friedman		95570		
Catherine Peacock		95501		
Stanton Wood		95503		
Breann Burgess		95519		
Annika young		95521		
Richard BEA		95524		
Sophia Escudero		95521		
Harmony Tryon		95519		
Rose Alvera		95524/92677		
Portia Herger		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Vivian Mitchell	[redacted]	95521	[redacted]	
Yannet Plascencia		95521		
Kaila Gilbert		95521		
Abraham Sánchez		95521		
Scarlett Trippsmith		95521		
Timothy Watts		95521		
David Alvarez		95521		
Stephanie Perkins		95521		
Judith Escobar		95521		
Abby Daniel		95521		
Eve Ashbrook		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Eva Villamor	[redacted]	95521	[redacted]	
Mary Gardner		95521		
Lila Davis		95519		
Monnie MacRae		95521		
Linda Lomeli		95570		
Austin Medlin		95521		
Gavin Schneider		95521		
Alisa Ibyadul		95521		
Alexander Arroyo		9552 1		
		Earth		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Shirley Wo	[redacted]	95519	[redacted]	[redacted]
Faire Phoenix		95519		
NATHAN DAVIS-FLOYD		95521		
JOSE CASTILLO		95521		
Jasper Gi		95521		
Kevin Lenno		95501		
Lorca Nolen		95503		
Cynthia Noel		95563		
Jane Riggs		95521		
Jeri Corsi		95501		
Gwen Sharnock		95503		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Tahjah Pleasant	[redacted]	92553	[redacted]	[redacted]
Monica Arteaga	[redacted]	92553	[redacted]	[redacted]
Angelica Armijo	[redacted]	95521	[redacted]	[redacted]
Kristi Albert Valles	[redacted]	95503	[redacted]	[redacted]
Erica Davis	[redacted]	95521	[redacted]	[redacted]
Taylor Harrington	[redacted]	95519	[redacted]	[redacted]
John Davis	[redacted]	95501	[redacted]	[redacted]
Bob Doran	[redacted]	95521	[redacted]	[redacted]
Stephen	[redacted]	95521	[redacted]	[redacted]
Samantha Nickles	[redacted]	95521	[redacted]	[redacted]
Rebecca Wood	[redacted]	95521	[redacted]	[redacted]

Petition

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Name	Signature	Zip Code	Optional: E-mail Address	Optional: Phone
Calla Peltier-Olsen	[redacted]	Fortuna	[redacted]	
Rosemary Shultz		Ferndale		
Kelsey Reedy		95502		
Zoë Reiss		95524		
Jade Taylor		95521		
Melissa Horne		95519		
Alex Riggs		95501		
Daniel Noel		95521		
Lily Price		95521		
Ines Morales		95521		
Jenna Evangelin		95503		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Ines Morales	[redacted]	95521	[redacted]	[redacted]
Cal Lierheimer		95521		
Noreen O'Brien		95503		
Stephen Kegics		95501		
Sandra Hayner		95501		
Tim Rice		95501		
Alica Pitt		95540		
KEN HARPER		95503		
Celene Molina		9550		
Joyce Hammond		95501		
C/Seidner		95551		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
[illegible]	[redacted]	95570	[redacted]	
Mina [illegible]		95519		
Daryl Bolling		95523		
Laurene Hirsch		95519		
Tiffany Perez		95521		
Turner Lovell		95521		
John Olson		95524		
Taylor Day		95521		
Kayla Law		95525		
Elizabeth Herrera		9550[illegible]		
Mike WACKNEA		95519		

Petition

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NAME PRINT	SIGN	ZIP	EMAIL PHONE
[illegible] RICHARDS	[redacted]	95519	[redacted]
Liz Kimura		95501	
Hannah Sosang		95521	
[illegible] Peterson		95521	
Carolyn Walker		95519	
Jeremy C. Shellhas		95521	
Kelsey Rancourette		95521	
Katie Reid		95521	
Leonard		95521	
Stella Jones		95521	
Kerima Furniss		95521	

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
SHERRY HULL	[redacted]	95501	[redacted]	
FRED KASSMAN		11		
Janice Coates		95521		
Jan Andrews		95525		
Kry 2+a Giuntini		95521		
Jodi Giuntini		95525		
Dayna Boggs		9553		
Angela Johnston		95503		
Elizabeth Barra		95503		
Melissa Thomas		95501		
Q 4 RY		95501		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Lee LeJanic	[redacted]	95570	[redacted]	
Jada LeJanic		95570		
Cindy Elliott		95562		
TREAT Hill		95521		
peiye rinehart		95521		
Toni Peters		95502		
Victoria		95540		
Abigail Hosting-Thorp		95524		
Isabel Duplantier		95521		
Jack Miklik		95521		
ALEX TEXARA		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Michal Tega	[redacted]	95521	[redacted]	[redacted]
Mario Fernandez	[redacted]	95501	[redacted]	[redacted]
Christopher Larsen	[redacted]	95501	[redacted]	[redacted]
Patricia Milad	[redacted]	95501	[redacted]	[redacted]
Dand Batts	[redacted]	95521	[redacted]	[redacted]
Fernando Paz	[redacted]	95521	[redacted]	[redacted]
PETER LOMEY	[redacted]	95521	[redacted]	[redacted]
Elija Rutledge	[redacted]	03	[redacted]	[redacted]
Emanuel Everhart	[redacted]	95501	[redacted]	[redacted]
Xandra Manns	[redacted]	95501	[redacted]	[redacted]
CAROL SAUCIER	[redacted]	95561	[redacted]	[redacted]

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
PEGGY DARM	[redacted]	95503	—	[redacted]
Walter Pecke	[redacted]	95503		[redacted]
LAURA Simpson	[redacted]	95519	—	[redacted]
Tom Lynn	[redacted]	95521	—	[redacted]
Elaine Dakrue	[redacted]	95503	—	[redacted]
DANNY Sokolsky	[redacted]	95503	—	[redacted]
Judy Haggard	[redacted]	95519		[redacted]
[illegible]	[redacted]	"		[redacted]
Iris Light	[redacted]	95521		[redacted]
Paula Luna	[redacted]	95521		[redacted]
Jean Munsee	[redacted]	95519		[redacted]

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
MARTHA DEVINE	[redacted]	95521	[redacted]	[redacted]
Theresa M. Devine		95519		
[illegible]		95521		
Braden Boss		95521		
Melanie Herrera		95521		
Mateo Flores		95521		
[illegible] Guyton		95521		
Phillip [illegible]		95521		
Ryan Studdert		95521		
[illegible]		95521		
LORENA BRYANT		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Daniel Osterman	[redacted]	95521	[redacted]	
Sarah Balster		95569		
Walker Bal[illegible]		95501		
Brian Curtis		95524		
Catalina Cullen		95521		
Margaret Ashcom		95519		
Ruelon Williams		95521		
Michael J. Frank		95519		
Adam Webster		95501		
Chloe Teese		95521		
Eileen		95501		

Petition

TELL REDWOOD COAST ENERGY AUTHORITY THAT BIOMASS IS NOT CLEAN ENERGY

We the undersigned residents of Humboldt County believe biomass from burning mill waste is not clean. It pollutes our air and emits far more greenhouse gases than replanted trees can absorb in the crucial next decade. Continuing to rely on biomass violates Redwood Coast Energy Authority's commitment to provide 100% clean renewable energy by 2025. **We call on RCEA to create a Comprehensive Energy Plan that will focus our resources on developing clean energy.**

Print Name	Signature	Zip	E-mail	Phone
Sara Pawlak	[redacted]	95521	[redacted]	[redacted]
Shay Livingston		95521		
Evan Grande		95525		
CLARISSA ORTEGA		95521		
KATHE BRATTON		95571		
Chandra Murray		95521		
Carey Weeks		95519		
Fionna Weeks		95519		
Judy Wu		95570		
Steph Lokan		95521		
Zaccaria		95501		

Petition

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
DIANE RYERSON	[redacted]	9554	[redacted]	
Joanne McGarry		95518		
Cena Marino		95501		
Jennifer King		95519		
Gina Collins		94903		
Ed Smeloff		95570		
Martha Hunkins		95521		
Shana Katz		95503		
Jereb Pino		95503		
Kora Cox		95503		
Pat Konzlee		95503		

LOCAL NOT PRIORITY

HOW WELL COULD WIND BALANCE SOLAR NREL

POTENTIAL FOR LOCAL PARTNERSHIP c̄ ONSHORE

TRANSMISSION

LG HYDRO VULNERABILITY TO CLIMATE

(FAST DC
EC DEV)

INCENTIVIZE
GETTING OLD VEHICLES
OFF ROAD

GETTING E FR. ELECT. DIESEL

LED/H GR
EL VS 11

Petition

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Aleida Solis	[redacted]	95521	[redacted]	[redacted]
Mike Golightly		95521		
Judy Gallagher		95519		
Kathy Sabilo		95501		
Mary Ground		95501		
[illegible]		95501-1654		
Eva Rutledge		95503		
Cinda Richel		95503		
Avery Arbaugh		95521		
Alex Farrell		95503		
Tammy Martin		95501		

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Print Name	Signature	Zip	E-mail	Phone
Andrea Johnson	[redacted]	95503	[redacted]	
Martica Nayati3		95524		
Elee Ballinger		95521		
Oliver Segner		95503		
Ephraim Egue		95521		
Sarah Kuhn		95521		
danielle Seabolt		9554		
Jean Nikolas		95570		
savana Thamer		92131		
ClarissaCardaa		95521		
Omega Gaskill		95524		

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Print Name	Signature	Zip	E-mail	Phone
Arice Ceutini	[redacted]	90019	[redacted]	
Bellin Ely		95570		
Andrew Mesita		95541		
Nicholas Bra		95571		
Jeff Hagerty		95521		
Joely Camacho		95521		
Christy Marks		95521		
Claire Brown		95521		
Reet Sende		95501		
Alley Barnes		95521		
Manuel Sanche		95521		

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Print Name	Signature	Zip	E-mail	Phone
Mackenzie R	[redacted]	95503		
Amadeus	[redacted]	95501		
Autumn Wright	[redacted]	95521		
Shalom Fletcher	[redacted]	95515	[redacted]	
Joseph Aguilar	[redacted]	95521	[redacted]	
Jesse B	[redacted]	95521	[redacted]	
Victor Cardona	[redacted]	95521	[redacted]	
Kim Willard-Mace	[redacted]	95521	[redacted]	
Alex Givens	[redacted]	94421	[redacted]	
Jade Coulter	[redacted]	95589	[redacted]	
Marina Stern	[redacted]	95521	[redacted]	

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Print Name	Signature	Zip	E-mail	Phone
Luis Gonzalez	[redacted]	95521	[redacted]	
RILEY GOWAN		95521		
Zöe Powell		95521		
Hannah Cornwell		95519		
Gabby Garza		95521		
Kaylin Jebail		95521		
Laura Landgraf		95003		
Lilli Levan				
Chris Ceri		95521		
Rachel Ostrander		95521		
Benjamin Ferrer		91702		

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Print name	Sign	Zip	Email	Phone
Martha Rank	[redacted]	95521	[redacted]	
Eileen Jennis-Sapp		95501		
Jordan Lamp'		95501		
LINDA O'HARA		95503		
Don Swall		95501		
Tara Spencer		83704		
Stephan Vandiver		95521		
GAIL SLAUGHTER		95521		
Lyn Scott		95503		
Hollie Kling		95501		
Carly Russell		95501		

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Print name	Sign	Zip	Email	Phone
Caroline Isaacs	[redacted]	95551	[redacted]	[redacted]
Jacqueline Mayral		95501		
Jerry Martien		95503		
Jill Gruninger		95540		
Emryn Grove		95521		
Dana Laurens		95503		
Karen Rice		95549		
Cat McAdams		95503		
Russell Scott		95501		
Randy Mayes				
OLLIE WINFIELD		95501		

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Print Name	Signature	Zip	E-mail	Phone
SARAH CAMPBELL	[redacted]	95573	[redacted]	
Madeline Marriott		93004		
VANESSA ARFONZ		95524		
Roger Conant		95524		
Larry Glass		95503		
Gary Falxa		95503		
Joan Tippetts		95501		
Chris Beresford		95524		
Richard Kreis		95501		
Dan Sealy		95507		
ALICIA Hamann		95524		

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Print Name -	Signature	- Zip	- E-mail	- Phone
Hannah McCarthy	[redacted]	95519	[redacted]	
Ariel Perez		91731		
Ray Triana		95521		
Raven Gialen		95570		
Bella Pantos		95570		
Celeste Jayne		95521		
[illegible]		95519		
Isabella Peña-Martin		95521		
Ara Guillen		95521		
Wendy Carranza		95521		
Sophia Magu		95521		

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Print name	Sign	Zip	Email	Phone
[illegible]	[redacted]	95561	[redacted]	
Robert Bier		95562		
LYNDA McDEVITT		95570		
Ryan Stafsnes		95503		
Stephanie Bennett		95503		
Hannah Wayte		95573		
S. Jay Tallmadge		95503		
Joshua Adels		95503		
Ryker Avila		95503		
Michelle Gladhi		95503		
Julia Heatherwick		95501		

Jesse Noell +

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Print Name	Signature	Zip	E-mail	Phone
Dorine Lein	[redacted]	95501	[redacted]	
Aida Kastel		95521		
Brian Fagundes		95521		
Erbin Brown		95501		
Woodrow Anderson		95541		
Bonnie Anthony		95521		
Andrea Paulette		95521		
Vanessa Vando		95570		
Liz Yellin		95564		
Oliver Jones		95521		
Kaylin Jebail		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Audrey Derry	[redacted]	95503	[redacted]	
Michael Beckowitz		95503		
Amy Beckowitz		95503		
Claire Josefine		95503		
Laura Cooskey		95558		
Rachel Grossman		95521		
Ellise Mather		95521		
Jesse Noell		95502		
Kyle Barney		95521		
Nancy Ibarra		95521		
Ken Miller		95519		

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NAME PRINT	SIGN	ZIP	EMAIL PHONE
Kathleen A. Marshall	[redacted]	95521	[redacted]
Miana Gilkerson		95549	
Maureen Hart		95521	
Ann King Smith		95521	
Ann Wallace		95521	
ALEXANDRA STA		95521	
Casandra Castruita		95521	
Tania Mejia		95521	
Katherine Polik		95521	
Shasta Werthman		95521	
Elsa Base		95521	

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Print Name	Signature	Zip	E-mail	Phone
Megan Gardner	[redacted]	95521	[redacted]	
Ryan Walrod		95570		
Michael MacAlister		95521		
Gabriela Segura		95521		
Nancy Lucatell		95518		
Maeve Flynn		95521		
Donna Simat		95521		
West Modaffari		95521		
Anne Holcomb		95525		
JON FORSYTH		95521		
Kristy Neumann		95519		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Megan Bristow	[redacted]	95521	[redacted]	
Hannah LeWitter		95524		
Molly Houston		95521		
Julianne Blandford		95521		
Maren McComas		95501		
Abigail McComas		95501		
Lučić Valentine		95521		
Jane McCaffrey		95521		
Lucas Campbell		95521		
Grant Johnson		93442		
Keary Kennedy		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Anika Sun	[redacted]	95521	[redacted]	
RaJMELIN		95570		
Joshua Frye		95519		
Jim Lennon		95521		
Stephan Brindley		95521		
Patricia Ford		95521		
Laura Miller		95521		
Jackie Seidel		95521		
Ana O-Ca		95521		
Klara Hernande		95501		
REGINE FAMILA		95		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Shawon Stysman	[redacted]	95519	[redacted]	[redacted]
FRANK TEPPER	[redacted]	95519	[redacted]	[redacted]
PAT McCutchea	[redacted]	95521	[redacted]	[redacted]
Shannon Roberts	[redacted]	95521	[redacted]	[redacted]
Kaitlyn Bloxsom	[redacted]	95521	[redacted]	[redacted]
Melissa Salter	[redacted]	95521	[redacted]	[redacted]
Sean Belmont	[redacted]	95521	[redacted]	[redacted]
Sylvia DeRo	[redacted]	95503	[redacted]	[redacted]
Lara Ashby	[redacted]	95521	[redacted]	[redacted]
ROBIN M. DONA	[redacted]	95540	[redacted]	[redacted]
Laurie Thaler	[redacted]	95521	[redacted]	[redacted]

5

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Daniel London	[redacted]	95501	[redacted]	
Byrd Lochtefeld		95503		
Peg Gardner		95503		
ANNE PIERSON		95503		
Angelica Taggart		95503		
Marion Cate		95540		
Cindi Knox		95501		
Kathryn Dunning		95501		
Rudolph C Kosits		95503		
Sandra Little		95503		
Cleo Carvino		95501		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
WENDY RING	[redacted]	95524	[redacted]	
Steve DERA		95521		
Thea Rowan		95521		
Michael Cianciola		95521		
nina klehr		95521		
Sheyda Gomez		95521		
Andrew Schwartz		95521		
JOHANNA RIVERA		95571		
Charity Freitas		95521		
Alyssa Huynh		95521		
Breana Cowell		95521		

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Print Name	Signature	Zip	E-mail	Phone
Audrey Garcia	[redacted]	95521	[redacted]	
Forrest Estes		95521		
Christopher Goo		95521		
Luke Aronie		95521		
Janessa Shaffer		95521		
Jezabel Duplantis		95521		
Ria Espinoza		95521		
Mia Sunderland		95521		
April Steed		95521		
Jon I Abbott		95521		
Maeve Flynn		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Ramona Barb	[redacted]	95525		
Athina Laz		9/2/19		
Janice Dean		9/2/19		
Adrian Dobson		95501		
Sara M Dobson		95501		
JOHN SCHAEFER		95521	[redacted]	
Sylvia Shaw		95521		
Ann Kilby		95549		
Archie Mossman		95570		
SUE Y. LEE MOSSMAN		95570	[redacted]	
Marianne Pennekamp		95503		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Angelis Lewis	[redacted]	95501	[redacted]	

APC

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Debra R. Harrison	[redacted]	95518	[redacted]	

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
McKenna Kelly	[redacted]	95521	[redacted]	
Mike Com		95521		

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Print name	Sign	Zip	Email	Phone
Andy Caffrey	[redacted]	95542	[redacted]	[redacted]
Jeff Bine		95501		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Gerry Tollefson	[redacted]	95501	[redacted]	
Annette Hull		95519		
Carolyn Bell		95570		
Carol Ryder		95521		
Moira Casey		95521		
JANE RIGGAN		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Mary A Madej	[redacted]	95571	[redacted]	
Shirley Bennett		95519		
Clare Greene		95519		
Raedelle Miller		95521		
Ronalda Carlson		95501		
L. Bacon-Ogden		95501		
Deborah Kelsa		95519		
Carolyn Prescott		95519		
Kathryn Johnson		95519		
Jon Reisdorf		95521		
Jean Munsee		95519		

Name	Sign	Zip code	Email
Andrea	[redacted]	95521	[redacted]
Patricia Pettit-Blair		95521	
Samantha Strickell		95521	
STEVE HOEHN		95521	

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Ava Biscoe	[redacted]	95521	[redacted]	[redacted]
Margaret Rohan		95520		
Molly Conso		95519		
Ulyses Dorantes		95521		
Canyon Smith		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Ash Ramirez	[redacted]	95521	[redacted]	[redacted]
MAYA HABIS		95521		
Dylan Anderson		95521		
Izzie Rod.		95521		
Valeria Olivares		95521		
Tania Cubas		95521		
Carolina Calvert		95521		
Zorida Caceras		95521		
Jennifer Martin		95521		
Jay Garfias		95521		
Luis Martinez		95501		

Petition

TELL REDWOOD COAST ENERGY AUTHORITY THAT BIOMASS IS NOT CLEAN ENERGY

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Supreet Bhullar	[redacted]	95503	[redacted]	[redacted]
Yasmin Reyes		95521		
Raquel Perez-Granados		95501		
Jennifer Lemon		95519		
Sneum Thornton		95519		
Jose Cabello		95521		
Jonathan Perez		95521		
Michelle Navar		95521		
Lizbeth Martinez		95521		
[illegible]		[illegible]		
Legn Garcia		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Brianna Rogue	[redacted]	93293	[redacted]	[redacted]
Blue Matute		95521		
Teralynn Bergsma		95521		
Nina Egbert		95501		
Katheryn Buzanski		95503		
Kayla Escola		95503		
Laura Noel		95547		
Gillian Ackman		95521		
Elizabeth Thorne		95521		
Annie Sampson		9552[illegible]		
Hayley Hudson		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Melanie Zhao	[redacted]	95521	[redacted]	
Kitty Kwan		95521		
TAMMY PHRAKONKHAM		95521		
Erdinel Mangubat		95521		
Caroline Mora		95521		
Hannah Chung		95521		
KAT NGUYEN		95521		
Caylyn McD		95501		
Mi Tam Ha		95521		
Ava Mark		95501		
Kimberly Baltazar		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
STEVE HOEHNE	[redacted]	95521	[redacted]	[redacted]
Kia lee		95501		
Francesca Messina		95521		
Katja Cragun-Rehder		95521		
Jasmine Guerra		95521		
Lorenzo Hernandez		95521		
James Newton		94960		
Manny Flores		95521		
Jose Moreno		95521		
Desiree Garcia		95521		
Elizabeth Sweeney		95521		

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NAME PRINT	SIGN	ZIP	EMAIL PHONE
Christian Trujillo	[redacted]	95221	[redacted]
Deema Hindawi		95521	
Alexandro Ochoa		95521	
Anayeli Anza		95521	
Lesly Vasquez		95521	
Karina Coronado		95521	
Casey Albarrah		95521	
Bernard Brun		95521	
Guymevere Cristobal		95521	
Jenna Lang		95519	
Maritza Loyaza		[illegible]	

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Victoria Haris	[redacted]	95521	[redacted]	
Jill Meadors		95525		
Mikhayla Kennison		95521		
Christine Duvall		95521		
Nico Platt		95521		
Shelley Magellan		95521		
Giselle Salomon		95521		
Brian Munoz		95521		
Will McDougall		95501		
Sam Schlosser		95521		
Kiley Perkins		95519		
Krystal Padilla		95521		
Natalia Ruiz		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Rio Greiger	[redacted]	95525	[redacted]	[redacted]
Merari Herrera	[redacted]	95525	[redacted]	[redacted]
Ryan Spear	[redacted]	95501	[redacted]	[redacted]
Kaitlyn Ludines	[redacted]	95501	[redacted]	[redacted]
Deanna Lomeli	[redacted]	95521	[redacted]	[redacted]
Arabella Stewert	[redacted]	95521	[redacted]	[redacted]
Hope Prendiville	[redacted]	95519	[redacted]	[redacted]
Mariano Marroquin	[redacted]	92106	[redacted]	[redacted]
Philip Nguyen	[redacted]	95521	[redacted]	[redacted]
Sam Moore	[redacted]	[illegible]	[redacted]	[redacted]
Alyssa Ledesm	[redacted]	95521	[redacted]	[redacted]

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
ROBBIE SANCHEZ	[redacted]	95521	[redacted]	
Daniel Krake		95521		
Kelli Schuler		95521		
Haley Graf		95521		
Madeline Hobart		95521		
Brianna Velasco		95521		
Alexis Ramirez		95521		
Casey McCullough		95521		
Winchi Dedeus		95521		
Cristalina Goulart		95520		
Jake Kordick		95521		

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NAME PRINT	SIGN	ZIP	EMAIL	PHONE
Esteban L.	[redacted]	95521	[redacted]	
JEANNIE		95570		
Connor		95501		
Andy L.		95501		
Carlos N.		95521		
Denali B.		95573		
Dexter M.		95521		
Silvia DeRook		95503		
Jenny Downs		95503		
Casey Kimbro		95521		
Klava Hernandez		95501		

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Daniel L. Sanchez
Cooperative Extension Specialist
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To: Board of Redwood Coast Energy Authority (RCEA)
Date: October 14th, 2019
From:
Daniel L. Sanchez, PhD., Cooperative Extension Specialist; Department of Environmental Science, Policy, and Management, University of California Berkeley
Yana Valachovic, University of California Cooperative Extension County Director and Forest Advisor; Humboldt and Del Norte Counties

Dear RCEA Board,

As Specialists and Advisors with University of California Cooperative Extension, we wish to highlight the importance of continued use of local biomass as an energy source for Redwood Coast Energy Authority's (RCEA) renewable portfolio. Biomass power produces benefits for our local community, economy, *and* the environment.

Our support for bioenergy production in Humboldt County arises from its numerous benefits: clean energy, improved forest health, ambitious climate change mitigation, and rural job creation. We recognize that no energy source is perfect, but on the balance, locally produced and utilized biomass provides numerous public trust, environmental, and economic benefits. More information about the benefits of woody biomass and bioenergy is included in an appendix to this letter.

In the future, we expect innovation to create new wood utilization opportunities with the potential for enhanced economic and environmental benefits. However, focusing on new technologies ignores the role that current biomass power plants play in creating benefits at scale. Existing biomass power plants provide a backbone to accommodate the diversity of feedstocks that are available as California develops and deploys emerging technologies.

We urge RCEA to sustain their commitments to bioenergy produced electricity and to Humboldt County for both the near-term and long-term benefits.

Sincerely,

Daniel L Sanchez, Ph.D.

Yana Valachovic, RPF #2740

The following was submitted to the RCEA Board by Yana Valachovic , UC Cooperative Extension County Director and Forest Advisor, Humboldt and Del Norte Counties, on October 14, 2019.

FAQs about Forest Biomass Energy in Humboldt

What are the benefits of energy made from forest biomass?

Forest-based biomass for this set of FAQs is defined as organic matter (materials from fuels reduction projects or the chips and bark from sawmill operations) that can be utilized to produce heat and power in emissions-controlled power plants that can provide clean energy, improved forest health, ambitious climate change mitigation, and rural job creation. **No energy source is perfect, but on the balance, locally produced and utilized biomass energy provides numerous public trust, environmental, and economic benefits** such as:

- ✓ Delivers distributed, flexible baseload generation. Biomass energy production provides a continuous 24-hour and reliable power source, unlike solar or wind that have a variation in daily and seasonal power production. Additionally, biomass power plants can be ramped up and down to meet the needs of the grid.
- ✓ An essential tool in the promotion of healthy forests and defensible communities through fuel reduction strategies for diseased and over-crowded forests that contribute to large and high intensity wildfires.
- ✓ Reduces emissions from wildfires or burn piles. Biomass power plants include effective air quality emissions technologies. Biomass emissions are substantially lower than wood stoves, wildfires, or burn piles[1].
- ✓ Reduces greenhouse gas emissions. Bioenergy production using materials from sustainably managed forests reduces long-term climate impacts by replacing fossil fuel energy sources.
- ✓ Utilizes a local product. The ability for forest landowners to sell logs to local sawmills provides an economic incentive to steward and sustainably manage local forests. Furthermore, farmers use the ash produced as an organic soil amendment.
- ✓ It's renewable. Unlike coal, oil and natural gas, which are fossil fuels that bring "new" carbon into the earth's atmosphere, biomass is an abundant and renewable source of fuel. The burning of biomass and the growth of trees creates a closed-loop system and does not contribute additional long-term atmospheric carbon. In Humboldt County biomass operations turn wood waste into electricity without compromising the essential cultural and habitat values that forests provide.

Is biomass clean energy?

There is no universally accepted definition of clean energy. Definitions can incorporate life cycle analysis, social justice, and other externalities. Nevertheless, the vast majority of scientists and governments classify biomass as both a clean energy and renewable (i.e. non-fossil fuel) source. The State of California defines biomass as a renewable energy resource along with solar, wind, geothermal, small hydro, renewable methane, ocean wave, ocean thermal, or fuel cells[2].

When bioenergy is made from locally grown small diameter trees and shrubs or the byproducts of sawmill operations it is a clean energy source. Not only do trees convert solar energy into fixed carbon, they store energy organically with far lower environmental impact than fossil fuels or batteries. This naturally fixed carbon and energy may then be managed as habitat in the forest, harvested for use as a building material, or

[1] Springsteen B, Christofk T, York R, Mason T, Baker S, Lincoln E, Hartsough B, Yoshioka T. 2015. Forest biomass diversion in the Sierra Nevada: Energy, economics and emissions. Calif Agr 69(3):142-149. https://doi.org/10.3733/ca.v069n03p142.

[2] https://focus.senate.ca.gov/sb100/faqs

utilized as energy in a biomass power plant. Burning biomass for bioenergy production is importantly distinguished from burning fossil fuels in that *biomass is part of the actively cycled carbon in the atmosphere and was sequestered within the past 40-100 years, while fossil fuels reintroduce carbon into the atmosphere that were sequestered 60-200 million years ago and now are being reintroduced into the atmospheric carbon cycle*.

All clean energy sources have an important role to play in fighting climate change and producing renewable energy. In this regard, biomass energy provides many advantages beyond its renewable electrons, especially when fuel is sourced from the local area. From producing long-lived building materials that sequester carbon, to generating renewable heating, cooling, and power in local communities, strategic biomass utilization can support the interrelated goals of forest health, forest carbon sequestration, water and air quality, creating and maintaining local jobs, as well as keeping forests healthy for everyone's enjoyment and recreation.

How does biomass support forest health?

The fire seasons of 2017 and 2018 in California[3] have been a reality check for many, forcing a collective understanding that forest management plays a key role in wildfire risk reduction. In California alone, at least 129 million trees have died since 2010, due to a combination of fire suppression leading to overstocked and dense forests[4], drought, and pests. Managing the large number of dead trees is a difficult challenge, particularly within the context of protecting rural California residents. In January 2019 the Governor charged CAL FIRE and the Natural Resources Agency with the task of reducing fuels to protect our most vulnerable communities. CAL FIRE estimates that 15 million acres need forest restoration[5] and recognizes that "while it is not possible to eliminate wildfire risks in California; focused and deliberate action can protect communities and improve forest and fuels conditions to enable a more moderate and healthier wildfire cycle that can coexist with Californians". These challenges are not limited to the Sierra Nevada and are common throughout California including the North Coast.

The North Coast is blessed and burdened with highly productive forest and plant growth. However, all living vegetation is part of the natural carbon cycle and its fate is eventual carbon release either through decomposition or wildfire. The question is when and how? Management of this growth in the form of forest fuels reduction and the reduction of stand densities are important steps to creating more fire resilient forests and reducing uncontrolled emissions of greenhouse gasses and Short-Lived Climate Pollutants, including black carbon, during wildfires. Over the coming decade California will see an enhanced level of fuel reduction through mechanical and prescribed fire techniques and a broader level of incentives to manage fuel backlogs and improve forest health. Bioenergy utilization with emission-control technologies is an important part of the solution and provides an alternative to open-pile burning[6] of forest fuels and prescribed fire.

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[3] Governor's Executive Order N-05-19 https://www.gov.ca.gov/wp-content/uploads/2019/01/1.8.19-EO-N-05-19.pdf and the state emergency declaration http://www.fire.ca.gov/general/downloads/45-DayReportPlans/3.22.19-Wildfire-State-of-Emergency.pdf

[4] Parsons and DeBenittie (1979) Impact of fire suppression on a mixed-conifer forest. Forest Ecology and Management 21: 21–33.

[5] CAL FIRE 45 Day Report. http://www.fire.ca.gov/downloads/45-Day%20Report-FINAL.pdf

[6] Springsteen B, Christofk T, York R, Mason T, Baker S, Lincoln E, Hartsough B, Yoshioka T. 2015. Forest biomass diversion in the Sierra Nevada: Energy, economics and emissions. Calif Agr 69(3):142-149. https://doi.org/10.3733/ca.v069n03p142. http://calag.ucanr.edu/Archive/?article=ca.v069n03p142

How does forest biomass utilization support climate change mitigation?

Biomass utilization produces important climate change mitigation benefits, both by sequestering carbon and displacing carbon-intensive products. Executive Order B-55-18 'To Achieve Carbon Neutrality', issued by Governor Brown on September 10, 2018, places California on a path to net-neutral economywide emissions by 2045[7]. Carbon sequestration from forest biomass will be essential to achieving this goal, as carbon stored in living trees or wood-based lumber products can help with long-term sequestration and to offset emissions from hard-to-decarbonize sectors such as aviation, long-distance trucking, and agriculture. Further, biomass power plants support removal of hazardous forest fuels that are otherwise placing these carbon stores at risk.

Furthermore, forest biomass has an important role to play in carbon sequestration. In the near-term, maintenance of bioenergy markets will help to make reducing forest fuels economically feasible thereby helping California's forests become more resilient to wildfire or other disturbances. In the future, RCEA and other energy consumers may be able to procure net carbon-negative electricity from biomass, which permanently removes CO_2 from the atmosphere. For instance, numerous scientists and policymakers recognize that biomass utilization combined with carbon sequestration (commonly referred to as BECCS—Bio-Energy with Carbon Capture and Storage) will be necessary if we are to keep global warming significantly below 2 degrees Celsius. Supporting biomass energy through power purchase agreements and other procurement mechanisms can help drive the deployment of BECCS technologies in California as they become commercially viable.

Finally, many recognize that a "portfolio" approach to fighting climate change produces large economic benefits in comparison to those that rely solely on a limited number of energy sources[8,9]. Biomass, alongside other complimentary renewable energy sources, can play an important role in achieving cost-effective climate change mitigation.

How does the State of California view biomass and forest carbon?

California's Forest Carbon Plan, released in 2018, embraces biomass utilization as a key driver of sustainable forest management[10]. Key findings include:

- Reducing carbon losses from forests, particularly the extensive carbon losses that occur during and after extreme wildfires in forests and through uncharacteristic tree mortality, is essential to meeting the state's long-term climate goals. Fuel reduction in forests can increase the stability of the remaining and future stored carbon.
- The limited infrastructure capacity for forest management, wood processing, and biomass utilization, and the limited appropriately trained or licensed supporting workforce, are major impediments to forest restoration and ongoing forest management.

Near-term actions proposed by the State include:

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[7] https://www.gov.ca.gov/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf

[8] D.L. Sanchez, J.H. Nelson, J. Johnston, A. Mileva, D. Kammen. "Biomass enables the transition to a carbon-negative power system across western North America." *Nature Climate Change*, 5, 230–234 (2015).

[9] S.J. Davis *et al.* (with over 30 authors) "Net-zero emissions energy systems" *Science* (2018). http://science.sciencemag.org/node/711939.full

[10] Forest Climate Action Team. 2018. California Forest Carbon Plan: Managing Our Forest Landscapes in a Changing Climate. Sacramento, CA.

- Expand wood products manufacturing in California and take actions to support market growth scaled to the longer-term projections of forest productivity and resource management needs.
- Continue public investment to build out the 50 megawatt (MW) of small scale (5MW or less sized facilities), wood-fired bioenergy facilities mandated through SB 1122 (Rubio, 2012).
- Maintain existing bioenergy capacity at a level necessary to utilize materials removed as part of forest restoration and to support long-lived storage of carbon in building materials.

What role does biomass have in rural job creation?

Biomass utilization creates economic opportunities locally[11]. Forest management and restoration activities cannot be outsourced and produce many living wage jobs in our local communities. These jobs include forest management, forest operations, trucking, processing, and other value-added operations. The many steps involved in bioenergy production require that workers be employed to operate each link of the supply chain. By having an integrated infrastructure rural development persists providing both near- and long-term economic benefits.

Does biomass utilization emit greenhouse gasses?

Yes, combustion of woody materials emits CO_2, however, these gases are already in the atmospheric carbon pool as opposed to releasing stored carbon from the fossil fuel pool (e.g. utilizing coal or natural gas for energy production). In short, utilization of organic sources of carbon for building materials or sources of energy is a part of a closed loop carbon cycle. When trees emit carbon from decomposition or through combustion in a wildfire, carbon is made available as CO_2 and can be sequestered from the atmosphere through photosynthesis into new organic forms.

Is biomass power the best means of handling the waste stream generated by our local forest products industry?

Yes, at present, power produced from the utilization of feedstocks from sawmill operations is the best means to utilize this material because:

- The utilization of chips, bark, sawdust, and other smaller pieces of wood to produce heat and power in emission-controlled power plants allows for utilization of a diversely-sized feedstock with a range of moisture contents. Other utilization options are not as flexible in their size or moisture variation.
- This material is abundant in our local region and does not require the importation of other feedstocks.
- Biomass energy complements other higher value markets, including using chips to produce pulp and paper, using bark and chips for landscape mulch, using sawdust for compost manufacturing, and using shavings for animal bedding. Bioenergy is part of a broad solution for the sustainable and renewable use of locally available woody materials. When no other higher value markets exist, the remaining residuals are used for energy production.

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[11] Henderson, James E.; Standiford, Richard B.; Evans, Samuel G. 2017. Economic contribution of timber harvesting and manufacturing to north coast redwood region counties. In: Standiford, Richard B.; Valachovic, Yana, tech cords. Coast redwood science symposium—2016: Past successes and future direction. Proceedings of a workshop. Gen. Tech. Rep. PSW-GTR-258. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 371-381.

- Looking for new and creative technologies and markets is encouraged and over time, these markets may include composting, gasification, or other uses (see discussion below). However, at present these markets do not exist at scale in Humboldt or within reasonable transportation distances.

In the medium- to long-term, new, innovative wood products could provide enhanced climate benefits and enhanced revenues from forest products. To this end, California has founded the Joint Institute on Wood Products Innovation[12] to serve as a center for analysis, testing, and outreach to support industry retention and development in California for new wood products. The work of the Institute will support long-term ecological and economic sustainability, increase forest resilience, long-term carbon storage, and local economies.

Should we be looking to emerging technologies such as gasification to keep using biomass as a power source?

Gasification is a process that converts organic materials into carbon monoxide, hydrogen and carbon dioxide. This is achieved by reacting the material at high temperatures (typically >700 °C), without combustion, with a controlled amount of oxygen and/or steam. Wood gas is a syngas fuel which can be used as a fuel for furnaces, stoves and vehicles in place of gasoline, diesel or other fuels. Biochar is a coproduct.

It is always valuable to look for higher value options and to test emerging technologies. However, gasification technology has not been deployed at scale yet to process the amount of available sawmill residues and requires a uniform feedstock free of soil and rocks. Moisture management of the feedstock is also critical. Some of the sawmill residue could be diverted to a gasification plant, but it would require a significant capital investment and tight controls on the feedstock quality.

An additional question is what is the lifespan of a biomass power plant and what modifications and improvements can be reasonably expected or are feasible? Furthermore, do these plants really age out or can they be upgraded when new emission control technologies become available? At present both DG Fairhaven and Scotia have invested significant capital into emission control technology upgrades and are operating within their existing air quality permits requirements.

Should we be continuing with the existing centralized power plant approach or looking to more decentralized emerging technologies?

Yes, we should explore emerging technologies and yes, we should recognize the value that the existing power plants provide as a backbone to accommodate the diversity of feedstocks that are available. There are challenges to financing and permitting new facilities that also need to be evaluated and it is important to recognize that innovation takes time. A recent example was the proposed development of a BioRAM eligible 5 MW biomass plant in Arcata that was derailed when PG&E required the developer to fund an additional $6 million upgrade of the PG&E substation. It could be viewed from a “bird in the hand is worth two in the bush” perspective where we are certain in what we have and there is no guarantee that future technologies will perform adequately or at scale. Permitting and capital investments for building new

[12] https://bof.fire.ca.gov/board-committees/joint-institute-for-wood-products-innovation/

infrastructure will likely continue to be a large barrier to deployment of emerging bioenergy technologies across the State and in the North Coast.

What can be expected if the existing power plants close?

- An immediate logistical challenge to divert the ~100-120 truckloads a day to Wheelabrator Shasta (in Anderson, CA), the closest biomass facility, and assuming they would take the material. This is a 300+ mile round trip haul. There are not enough trucks available to move this material.
- In the longer term, forest landowners, managers, and product manufacturers would be affected as these sectors shrink. Specific Humboldt groups include:
    - Manufacturing: Humboldt Redwood Company, Green Diamond, Mad River Lumber, North Fork Lumber, Schmidbauer Eureka, Pacific Clears, CW Wood, Arcata Lumber Products
    - Landowners of all sizes, including all small forested landowners, Bureau of Land Management, State and National Parks, USDA Forest Service, conservation organizations, etc.
    - Municipal compost facilities such as Arcata, Humboldt Waste Management Authority, Recology, etc.
    - Many licensed timber operators and trucking companies
    - And any further development of the forest products manufacturing sector. It is reasonable to assume there would be a contraction of this sector if the biomass power plants closed.

Could the sawmill residues be utilized for compost?

While compost is a promising option for wood waste, the industry faces a number of barriers to reaching scale. As a result, only smaller amounts of biomass can be utilized for compost. With the county's daily production of ~100-120 truckloads of biomass a day, there is no existing option available at scale. HRC alone produces 70-100 chip vans per day (5 days/week) of this material. It would take 2.65 days to fill a football field (120 x 53 x 5 yards) to a height of 15 feet with the volume of material that HRC generates. Storing large amount of chips present fire hazards because the decomposition process releases heat and fires are common. An additional challenge is that the local compost industry is currently experiencing a contraction. Finally, some portion of the compost will decompose and emit CO_2 and methane over time and the carbon will not be permanently sequestered.

Is biomass energy more expensive than other renewables?

Community-scale biomass facilities in California are currently receiving 12.7 to 19.7 cents per kilowatt (kWh) hour of power; RCEA is currently paying 6.5 cents per kWh for power from DG Fairhaven and Scotia. In contrast, distributed solar is typically 6 to 7 cents and large scale solar is 3-4 cents per kWh[13]. Biomass provides 24-hour base-load generation unlike wind and solar. If power needs were calculated on a 24-hour framework, wind and solar need other complementary sources to meet daily power demands. This is why biomass is an important Resource Adequacy tool for load serving entities. Right now, half of California's electricity comes from natural gas - so storage is not a problem because the gas provides both storage (gas can be stored) and generation- but as we phase out fossil fuels, solar and wind will increasingly require energy storage to meet demand.

[13] Julia Levin Per. Comm., Bioenergy Association of California

The energy storage needed to fill in around solar costs 25 to 50 cents per kWh. When the cost of battery storage is added to the costs of solar, then biomass has a competitive advantage. Furthermore, battery technology is still in development and their longevity and life cycle needs to be included in our analyses. As California fully decarbonizes its economy and phases out fossil fuels, bioenergy will become increasingly cost competitive. This is due to both its flexibility, and its ability to sequester carbon from the atmosphere.

Is RCEA providing a "subsidy" to the timber industry by purchasing power from biomass from the two power plants?

It could be viewed from that perspective; however, biomass produces numerous local benefits to offset its perceived higher cost. Biomass is the primary locally available and renewable power source, a key consideration for RCEA and meets Resource Adequacy standards. Minimal trucking and processing is required to utilize this source and new infrastructure does not need to be built. Biomass utilization is providing many community benefits including: an ability to steward and improve the resiliency of our forestlands, job creation; tightly controlled emissions of low-value forest residues; disposal of urban organic wastes; and a reliable source of 24-hour power that meets local energy demands.

Public Comment

The following public comments were submitted for the October 24, 2019, RCEA Board of Directors meeting on agenda item 5.2 - Long Term Renewable Energy Solicitation Update

Beverly Chang

[redacted]

Rio Dell, CA 95562

[redacted]

October 22, 2019

Redwood Coast Energy Association (RCEA)

633 Third Street

Eureka, CA 95501

Dear secretary to the Board of RCEA:

I am unable to attend the very important board meeting scheduled for October 24, 2019 at 1530 hours. It is my hope that you will be able to include this letter in the board's packet for the meeting and read the content to those attending.

There are many reasons that installing up to 60 over 500 ft structures (54 stories high) on Bear River and Monument Ridges an undesirable project in its current form. Anticipated impact to rare and endangered species, impact to historical native American sacred grounds, dayscapes and nightscapes (red/or white lights to be seen 20 miles for aircraft), increased fire hazard with over 26 miles of high voltage overhead transmission lines, timber removal for roads and transmission lines, and forever changing the ambiance of our community with the resulting impact to tourism to name only a few.

It is my hope that RCEA realizes that green power from the grid can be purchased from existing infrastructure. Until all solar and wind sources are fully utilized I see no reason to litter our community with these structures. Potential power generated from the Terra-Gen project would not necessarily stay in our community and from a previous RCEA meeting that I was able to attend I learned that there would not be a cost savings to RCEA.

I read an article dated June 25, 2019 authored by Peter Maloney, "Calif. Sets record for solar, renewable curtailments". The content of this article led me to believe that California is generating more renewable energy than our current grid system can fully utilize. In other words energy sources are growing faster than the infrastructure necessary to process/store it.

Please consider this view in your decision to support or not support this project with our Planning Commission. I think it more prudent for the project to move forward or not on its own merit.

It should be noted that if the Terra-Gen project moves forward on its own merit, I would fully support RCEA's purchase of power from this source as long as the power contract was equal in cost to other renewable energy sources. Fortunately there is plenty of time for this to play out before a commitment needs to be made.

Respectfully,

Beverly Chang

Beverly Chang

Monument Mtn.
VINEYARDS

Carol Hoopes
2330 Monument Rd.
Rio Dell, CA 95562

RCEA Board
633 3rd St.
Eureka, CA 95501

October 23, 2019

Dear Chairman and Redwood Coast Energy Board:

These comments are to address Item # 5.2 on your October 24th agenda regarding "Long-Term Renewable Energy Solicitation Update". This is in reference to your "Discuss and provide guidance/authorization for potential RCEA input to the County Planning Commission on the Terra-Gen/Humboldt Wine Energy project".

As officially elected representatives of our communities in Humboldt County, your potential input letter of support for the Humboldt Wind Project without the release of a Final EIR/approval is a premature action by the Redwood Coast Energy Authority. It is also a waste of staff time. As an official and influential entity of Humboldt, it is imperative to refrain from support until a project is approved. It is inappropriate to make site specific support of projects such as Terra-Gen's Conditional Use Permit application prior to approval.

Terra-Gen has offered this RCEA Board in a public meeting last Fall 2018 a scholarship to be used at the RCEA Board's discretion in exchange for your support of this project. Could this be a conflict of interest?

Since the RCEA Board has also gone on record to initiate a Power Purchase Agreement (PPA) with the Humboldt Wind Project, the RCEA Board has already given potential support of an unapproved conditional use project that will have detrimental effects to TPZ zones and Ag areas of Humboldt County. The purpose of the Final EIR is to mitigate adverse effects to the environment.

Please be fair to the CEQA process in place and refrain from submitting a letter for this site specific project until the Final EIR has been released and the project has been approved.

Regards,

Carol Hoopes

Carol Hoopes


VIEW FROM MONUMENT
MOUNTAIN VINEYARDS

From: David Simpson
To: Lori Taketa
Subject: Windmills
Date: Wednesday, October 23, 2019 4:27:05 PM

Dear Ms. Itaketa,

I was just informed that if I get this letter to you it would be read at the 4:30 RCES Board meeting.
Jane Lapiner and I have attended nee of the past 10 UNFCCC climate conferences and play to be in attendance in Chile in December for the next.

One element of climate change discussed in each event has been what is generally lumped under the heading of Geo Engineering. I have been forewarned by many astute observers of climate change worldwide that these projects are exceptionally dangerous and misleading. First, they are all huge projects on a sale that requires enormous output of machines and personnel. Second, they are each extremely capital-intensive requiring cash investments on a level of the largest constructions humans have undertaken. Fourth, they re all very high-tech requiring construction and measuring devices largely incomprehensible to most people. Fourth, they require complex intervention systems for when they malfunction which is often. Fifth, they are very difficult to operate successfully for long consecutive periods of time. Sixth,are well-known to do damage to the natural world around their construction.Seventh, they require regular replacement if they are expected to maintain peak capacity Eighth, their unintended consequences are almost impossible to predict but are usually extensive.

These are a couple of other common denominators but they're a good start at identifying projects we should avoid. Tera Gen’s project fits most if not all of these criteria.

Thank you,

David Simpson

From:	Ellen E Taylor
To:	Lori Taketa
Subject:	Email comment letter:
Date:	Wednesday, October 23, 2019 1:54:35 PM

Dear RCEA Board,

Thank you for the opportunity to comment on the Terra Gen wind generator project.

I live in the Mattole Valley, one ridge over from where the wind project is to materialize.
We residents therefore share the same ecosystem,and we have been trying to assist its
recovery for the past 40 years.

I am Chairperson for the Lost Coast League, which unanimously opposes this project. The sacrifice is
just too great. It heavily impacts habitat due to the nature and industrial scale of the construction.
Habitat in the region has already dwindled due to human activities, such that threatened and endangered species, even those supposedly protected by the ESA, are on the verge of extinction. Even a tiny incremental cumulative impact at this point abuses the public trust.

In the context of climate breakdown: over 900 acres of forest will be destroyed in the development of this
project. This is a naturally forested area, and could grow very large trees. As you may know, the doug firs and redwoods of the northern temperate rain forests can sequester carbon at 2.5 times the rate of the tropical rain forests. Except for the few giant trees which are protected, our forests have never been allowed to grow back to a size where they can achieve their full carbon-sequestering potential. They are harvested at 60 years or so although they can live well over a thousand years.

If our motive in developing alternative energy is to assure our children's and grandchildren's safety,
to destroy these live generators of healthy air quality is seriously misguided. They do not have a short lifespan, as do the planned structures.

We are a natural-resource-rich county. If we take pride in that, it wil help us not to panic and become just another example of the shock doctrine.

Very Truly Yours,

Ellen Taylor, Chairperson, Lost Coast League
PO Box 60, Petrolia California 95558
629 3500

From: [redacted]
Sent: Wednesday, October 23, 2019 11:52 AM
To: Lori Taketa
Subject: Public Comment Hum Wind

Follow Up Flag: Follow up
Flag Status: Flagged

Dear RCEA Board:

Please accept my public comment electronically.

I am a retired University professor and author of the book "Frogs, Inside their Remarkable World" from Firefly Press. I wrote a natural history column for twenty years. I retired to Humboldt County particularly to live in an area which is relatively undisturbed by corporate enterprise and full of natural beauty. I have spent a lifetime advocating for nature, with my students, colleagues, in person and in writing.

I have many reasons for not supporting the proposed Bear River Ridge/Monument Ridge TerraGen Humboldt Wind Energy project. I recommend that RCEA also consider not supporting it for the following major reasons.

In the TerraGen DEIR, there were 26 places where they had no way to mitigate for significant impacts. They did not mention the permanent disruption to areas adjacent to Redwood Parks. They did point out their planned lack of compliance with current Habitat Conservation Plans and Timber Harvest Plans, the Headwaters Forest Agreement, the Williamson Act and other documents created by joint efforts of stakeholders and the government over a long period of time. There were an additional 34 plans and documents required by the CEQA process which were omitted from the DEIR.

At no place in the document did they specify the exact equipment to be installed, but stated it could be up to 600 feet tall - the height of the Golden Gate Bridge. This would put the exact center of the rotational energy and air disturbance at the height of the tallest redwoods - 300 feet. There are images of turbines in fog https://physics.stackexchange.com/questions/13387/what-does-the-quantification-of-causes-and-effect-look-like-for-clouds-in-offsh which clearly show the turbulance. This wind whipping happens all the time - we can only visually see it with fog. Radar can see it all the time. NOAA requests that turbine farms be situated more than 30 miles away from Doppler facilities (https://www.weather.gov/mkx/windfarm). This project is within 30-miles of the Ferndale Doppler facility.

Relatively undisturbed grasslands and timber sequester more carbon than any industrial project ever will. Bugs, birds and bats will all be negatively affected by this project. Redwood tops will be dried out by the turbulence created by the aptly named turbines. Fields Landing will be disrupted for up to six months. The route 101 corridor

will be affected for about a year initially, and again any time anything needs to be replaced. Hundreds of man trips and truck trips will occur on ridges which now may be visited a few times a year. This is serious disturbance, and should not be decided upon lightly.

Having recognized these problems, disruptions and disturbances, I was cheered to read that RCEA is aware of the difference in disturbance between onshore and offshore wind.

I would like to read into this record what Matthew Marshall, the executive director of RCEA, was quoted by the Mad River Union as saying at a Eureka meeting recently "The offshore turbines are very big - unlike on land, you don't have the constraint of moving things around by truck... So the scale of these is much larger, and with fewer turbines there is more efficiency and reduced costs." He added that the tip of the blades would reach about the height of the Golden Gate Bridge being at the 600-foot-tall range.

Since we as a county are actively working with RCEA and our elected officials for offshore wind, and since the executive director of RCEA states unequivocally that offshore turbines are more efficient and produce power at reduced costs, I feel that there is no reason to approve the TerraGen terrestrial project with its associated disruptions since the offshore project will produce the same or more power than the onshore project. There is only so much transmission electron flow availability in Humboldt. One project could preclude the other due to grid saturation. It would be wise to "take the path of least resistance," utter a great and mighty "Ohm," and let the folks who live here get back on with their lives.

Thank you.

Sincerely,

Ellin Beltz

From: [redacted]
To: Lori Taketa
Subject: Terra Gen industrial wind energy
Date: Wednesday, October 23, 2019 4:47:33 PM

The proposed plan is a waste of time and energy. Literally. The carbon footprint to build and transmit makes this a losing proposition because by the time it delivers power, offshore instillations will vastly overcompensate for renewable power. This without fragmenting the rare biodiversity found on Monument Ridge. Solar powered micro grids are a far better source and far more resilient supply of power at this time.
Thanks, Howard Russell Eureka.

Sent from my iPad

Siskiyou Land Conservancy

RCEA Board
633 3rd St
Eureka CA 95501

Oct 23, 2019

RE: Agenda 5.2 and 6.1 of your agenda

Dear Ms. Taketa,

I.
Sec 5.2: Based on the arguments below, the fact that a CUP has not been approved, and your conflict of interest based both on your premature PPA with TerraGen as well as a proffered scholarship offered from TerraGen to RCEA, I suggest there be no further premature and potentially illegal advocacy of this project before TerraGen's proposed permit has been finalized.

If anything, RCEA would do justice to our community by objecting to the un-mitigable fragmentation and hydro-meteorological impacts to a biodiversity hotspot, and adding insult to injury to the Wiyot Tribe, which has suffered unspeakable horrors, as powerfully articulated in the Wiyot submission to the TerraGen DEIR: "Should this development and desecration of ***Tsakiyuwit*** proceed, it would seem to reinforce the colonial domination and genocide associated with these persons and their atrocities, and serve as a constant reminder to Wiyots of how their lands were violently taken for the sake of profits by powerful, privileged, and elite euro Americans."

II.
Sec 6.1 of the RCEA agenda relies on "islanding" Humboldt's electricity production and supply, which does not ensure resilience.

Resilient energy production and supply are critical in these times of grid vulnerability, wildfires, and the ever-present threat of disasters and emergencies that cut us off from centralized electricity supplies, and each other.

However, this sole reliance on central utility electricity supply relegates distributed electricity generation to the status of a poor stepchild dependent upon expensive individual projects that lack the economy of scale and the diversity of innovative technological and financial opportunities available.

If RCEA put out the welcome mat to solar entrepreneurs and financiers to solarize our county, and promoted widespread distributed onsite solar minigrids with V2G capability, we could start having secure resilience and owning the systems that generate our power by the time TerraGen would come on-line in 2023, but without the immediate massive GHG emissions associated with TerraGen's construction. These emissions will nullify any advantage before offshore electricity starts in 2025-2030.

Equity ownership is ignored when these solar systems' costs include only cost per kwh; so is the priceless value of secure resilience.

Despite the added renewables to the grid in the US since the Rio Agreement over 30 years ago, electricity usage has outpaced the benefits of these renewables. Utility electricity is therefore not only increasingly expensive over time by comparison, but it's unlimited supply increases electricity use and our carbon footprint, and does nothing to incentivize electric vehicle acquisition.

Distributed solar does both: reduced PGE electricity usage is inherent in local solar systems roughly equal to that produced, and ownership of an electric vehicle and the fuel it requires accelerates the payback time for the solar system. Since transportation accounts for 60% of our local GHG emissions, electrifying our transportation is urgently necessary.

During the recent grid shutdown, the vice-chair of your CAC posted this to FB:
"Redwood Larry Goldberg Zuleika Del Pardo - Do you own or rent? If you're a homeowner, I can help you get financing that would bring monthly payments equal to or just slightly more than what you're paying to PG&E now. Message me and we can talk offline."

And Matthew Marshall's brother at Schatz installed a "nano-grid" at his home to utilize his EV battery to supply electricity to his home.

These are the sorts of services that RCEA could provide and promote, instead of blind devotion to utility scale onshore wind electricity production, a policy that divides our communities and concentrates our energy wealth in the hands of very few, leaving the rest of us captive and powerless. A solarization policy would have wide general support because it can benefit everyone in many ways, as we, not TerraGen, do our part.

Finally, it is a most arrogant and alarming position to defile these sacred Wiyot sites, which are not just confined to a small area on Bear River Ridge, as documented throughout the Wiyot's comments to TerraGen's DEIR, especially with respect to the prairie grasslands, described as "native perennial grasslands in California are among the most endangered ecosystems in the United States," and "[T]he proposed development of the coastal Prairie complex on *Bear River and Monument Ridges* would severely impact these premier and fleeting examples of this critically endangered habitat, whose origins most likely lie within the cultural burning practices of Wiyot ancestors."

A critical element of the 1992 Rio agreement was to "not to carry out any activities on the lands of indigenous peoples that would cause environmental degradation or that would be culturally inappropriate".

Now is our time to remedy our critical need for resilient energy, and honor and stand with the Wiyot People.

Ken Miller
SLC

From:	Michael Evenson
To:	Lori Taketa
Subject:	Terra-Gen is not what we need
Date:	Wednesday, October 23, 2019 1:43:04 PM

Dear RCEA,

Thank you for accepting email comments. I cannot be with you today.

Terra-Gen proposal will NOT (by their own EIR) result in reduced GHGs. Do not embrace this project.

If we learned one thing from the Blackout, it's this: Humboldt County needs to use what power it can generate here and not depend on the grid.

But we knew that one. With a history of a rugged embrace of living close to the ground, within our means and independent of the over-developed south, Humboldt pioneered the "off the grid" life decades ago. (Some may say centuries ago).

Let's not fear the next step, and, following in the path laid down by the Blue Lake Rancheria, truly be responsible for our electrical needs. Roof top solar must be organized into decentralized local power grids. PG&E's one-grid-fits-all model is unreliable, vulnerable and requires hugely expensive upgrades and maintenance. Now is the time to transition out of that failing grid into something that reflects our strengths and values.

It is fitting that both Blue Lake and Wiyot people are leading the way. The Mega Wind Farm around Scotia would be a step backward: tearing up the countryside, use herbicides over the clearcut 1000 acres for transmission lines, exporting power and dollars and, with increasing frequency, leaving us powerless.

Michael Evenson
[redacted]
Petrolia, CA 95558

Michael Evenson

Lost Coast Ranch®
Petrolia, California
[redacted]

From:	Sean DeVries
To:	Lori Taketa
Subject:	RE: Terragen Wind
Date:	Wednesday, October 23, 2019 6:44:38 PM

Please add the following to public comment: [Thank you]

If we build the Terragen Wind project, there will be: decreased property values; county tax increases to pay for upgrades to roads; increases to PG&E rates for substation upgrades to handle the increased loads; and all with no incentives for the community that is being most affected.

The electricity will be going for sale on the grid -- out of the region -- which means that we will not see any benefit to ruining our environment.

The jobs will be temporary construction, most likely governed by outside experts. The 15 jobs boasted to be ongoing are all going to be specialists brought in from other areas, unless they are including janitorial.

The county is being paid $2 million dollars per year for this intrusion, for the 30 year life of the project.

They are selling out our health, environment, and peace of mind on the cheap.

Thank you,

Sean DeVries

Public Comment

The following public comments were submitted for the October 24, 2019, RCEA Board of Directors meeting on agenda item 6.1 - PG&E Public Safety Power Shutoff Event

Public comment submitted on agenda item 6.1
PG&E Public Safety Power Shutoff

Dear RCEA Board

If you were discomforted without PG&E electricity for 24 hours, you should be delighted to know that you have proven, lower cost, choices to avoid such discomfort in the future.

The Blue Lake Rancheria's solar rooftop system clearly demonstrated that achieving energy independence is possible with preparation, allocation of resources, and political commitment. Solar is prudent, available, reliable, cost effective and a good investment.

Rather than prioritizing implementation of widespread solar, Redwood Coast Energy Agency has focused on expensive utility scale onshore wind with dangerous transmission lines through fire prone forests. Only local distributed solar can eliminate the need for incendiary transmission lines thru forests.

Our policy makers need to proactively deploy a variety of appropriate distributed energy strategies including installing translucent solar panel arrays on County buildings, infrastructure, equipment yards & parking lots to realize the resilience so critical to our County during emergencies.

Instead our policy makers and Supervisors are surrendering obscene profits at our expense to TerraGen rather than developing energy independence for us constituents This is not doing our part to alleviate the climate emergency, rather it is conceding to a colonizing global powerhouse whose mission is to increase, not reduce, energy use.

Electricity from biomass and TerraGen costs $65-50 per Mwatt or over 5 times as much as my rooftop solar, and we would own nothing after decades of payments; yet RCEA has deployed far less than 8 Mwatts of solar in RCEA's 30 Mwatt goal. My solar rooftop generates at a 25 year project cost of less than $9 per MWatt. Because solar is so cost effective and low impact and because Humboldt County must convert to electric vehicles for transportation to reduce fossil fuel emissions, RCEA's priority goal should be 300 MWatts of solar by 2025--- rather than 30MWatts by who knows when. RCEA, by contracting for unaffordable high cost biomass and wind power, is encouraging grid abandonment.

To the extent that RCEA focuses its resources on Humboldt Wind and biomas RCEA ignores its opportunity to support agriculture by placing bifacial solar panels over fields in Rohnerville, Loleta, Kneeland, and Arcata flats while conducting agriculture beneath.

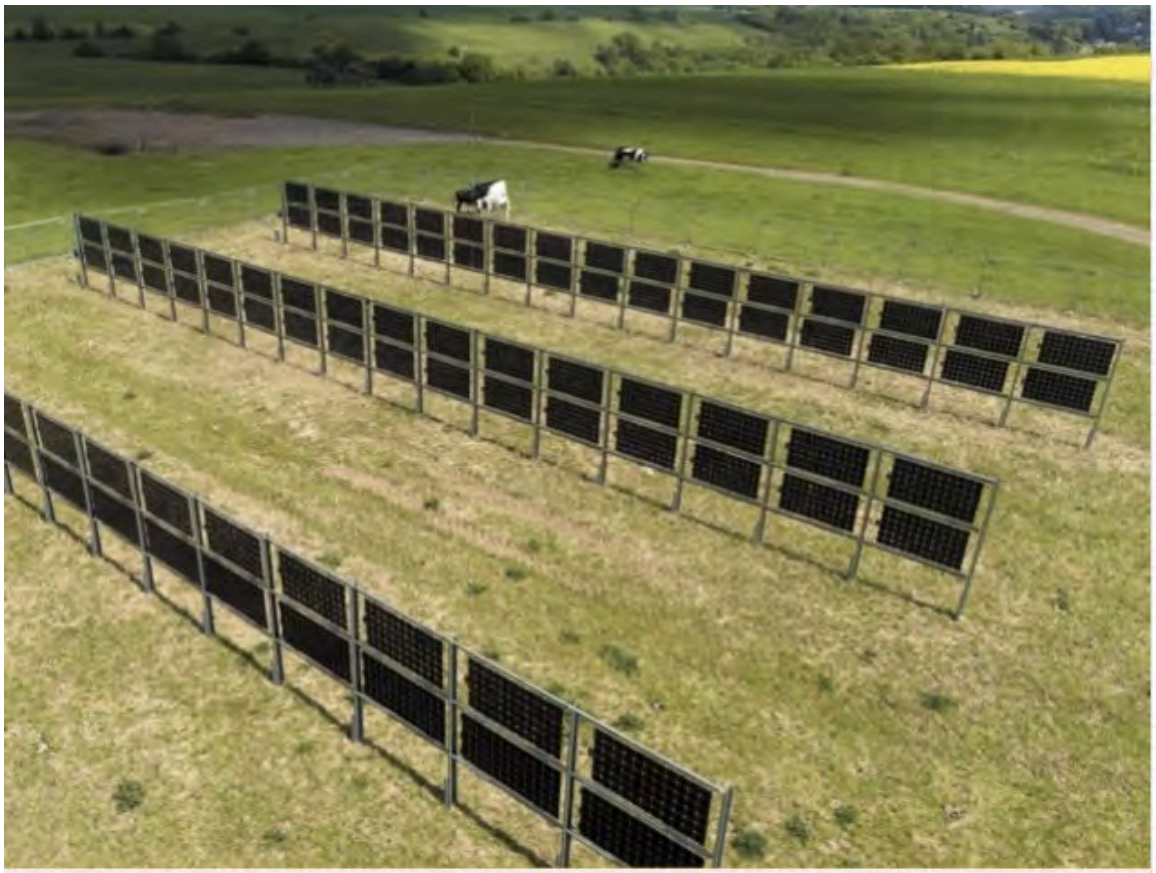

Image Credit: Photon Magazine

As we commemorate Indigenous Peoples, and look back in horror at the genocide and ecocide committed by our local founding fathers, we can finally honor the wisdom of the Wiyot Tribe, which opposes TerraGen's industrial wind factory---and ***<u>solarize</u> not cannibalize our precious resources.***

Jesse Noell farms in Elk River

Graduating From Blackout School

It's hard to read the PGE blackout story without appreciating this opportunity to learn to solarize our County. The day of the "blackout" was plenty sunny to keep the fridge going with a few solar panels, overnighting to the next day.

Those few with solar panels and batteries were fine, often powering one or two critical circuits. We realized that mini-solar grids could serve multiple dwellings and neighborhoods, sharing energy. At least one techie with an electric vehicle lit his home with his car battery.

Social media flooded us with advice, with one solar expert offering to finance rooftop solar for the cost of a PGE bill.

We learned the crucial distinction between centralized and distributed power generation, the former coming from the grid, the latter originating close to where it is used. And we learned that over-reliance on the grid and its incendiary transmission lines, even if our local production were "islanded," leaves us vulnerable, especially in real emergencies that cut us off from services and each other. TerraGen's wind factory would not have helped.

Mad River Hospital's diesel generators consumed 10 gal/hr pumping 220 lbs CO2 per hr into our climate emergency. Multiply that by the 100 generators sold out in one day at one store, and 100x that around the county, add in all the greenhouse gasses (GHGs) from drilling, refining and barging those fossil fuels, and you have a recipe for climate suicide.

With distributed solar, we can reduce our energy consumption and GHG emissions, have secure resilience during emergencies, fuel electric vehicles affordably, and own our mini-solar systems over time. It's the best way *for us* to do our part for the climate emergency. Now that we are smarter, do we have the political will?

Ken Miller

[redacted]

McK 95519

[redacted]

[redacted]