Redwood Coast Energy Authority
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BOARD OF DIRECTORS MEETING AGENDA (AMENDED)

March 25, 2021 -Thursday, 3:30 p.m.

COVID-19 NOTICE

RCEA AND HUMBOLDT BAY MUNICIPAL WATER DISTRICT OFFICES WILL NOT BE OPEN TO THE PUBLIC FOR THIS MEETING

Pursuant to the Governor's Executive Order N-29-20 of March 17, 2020, and the Humboldt County Health Officer's March 30, 2020, Shelter-in-Place Order, the RCEA Board of Directors meeting will not be convened in a physical location. Board members will participate in the meeting via an online Zoom video conference.

To listen to the meeting by phone, call (669) 900-6833 or (253) 215-8782. Enter webinar ID: 819 7236 8051. **Join the Zoom webinar online** at *https://us02web.zoom.us/j/81972368051*.

You may email public comment to *PublicComment@redwoodenergy.org* before and during the meeting. Please identify the agenda item number in the subject line.

To comment live during the public comment periods, raise your hand in the online Zoom webinar, or press star (*) 9 on your phone to raise your hand. When it is your turn to speak, a staff member will unmute your phone or computer. You will have 3 minutes to speak. For assistance participating in the meeting online, please call (707) 269-1700 or email *Ltaketa@redwoodenergy.org* at least 3 business days before the meeting.

While downloading the Zoom application may provide a better meeting experience, you do not need to install Zoom on your computer to participate. After clicking the webinar link above, click "start from your browser."

In compliance with the Americans with Disabilities Act, any member of the public needing special accommodation to participate in this meeting should call (707) 269-1700 or email *Ltaketa@redwoodenergy.org* at least 3 business days before the meeting. Advance notice enables RCEA staff to make their best effort to reasonably accommodate access to this meeting while maintaining public safety.

Pursuant to Government Code section 54957.5, all writings or documents relating to any item on this agenda which have been provided to a majority of the Board of Directors, including those received less than 72 hours prior to the RCEA Board meeting, will be made available to the public at *www.redwoodenergy.org*.

OPEN SESSION Call to Order

1. REPORTS FROM MEMBER ENTITIES

2. ORAL COMMUNICATIONS

This time is provided for people to address the Board or submit written communications on matters not on the agenda. At the conclusion of all oral communications, the Board may respond to statements. Any request that requires Board action will be set by the Board for a future agenda or referred to staff.

3. CONSENT CALENDAR

All matters on the Consent Calendar are considered to be routine by the Board and are enacted in one motion. There is no separate discussion of any of these items. If discussion is required, that item is removed from the Consent Calendar and considered separately. At the end of the reading of the Consent Calendar, Board members or members of the public can request that an item be removed for separate discussion.

3.1 Approve Minutes of February 25, 2021, Board Meeting.

3.2 Approve Disbursements Report.

3.3 Accept Financial Reports.

3.4 Approve Professional Services Agreement with Calpine Energy Solutions LLC and Authorize the Executive Director to Execute the Agreement and All Associated Documents as Necessary, Contingent on Final Review and Approval by RCEA Legal Counsel.

4. REMOVED FROM CONSENT CALENDAR ITEMS

Items removed from the Consent Calendar will be heard under this section.

COMMUNITY CHOICE ENERGY (CCE) BUSINESS (Confirm CCE Quorum)

Items under this section of the agenda relate to CCE-specific business matters that fall under RCEA's CCE voting provisions, with only CCE-participating jurisdictions voting on these matters with weighted voting as established in the RCEA joint powers agreement.

5. OLD CCE BUSINESS - None

6. NEW CCE BUSINESS - None

END OF COMMUNITY CHOICE ENERGY (CCE) BUSINESS

7. OLD BUSINESS - None

8. NEW BUSINESS

8.1 Biomass Analysis

Accept *Biomass Power in Humboldt County* report and presentation from consultant Michael J. Furniss.

Accept *Alternative Uses of Biomass Material in Humboldt County* preliminary report from the Community Advisory Committee.

8.2 Board Meeting Duration and Frequency Adjustments

Discuss meeting preferences and vote to call quarterly special meetings, if desired.

9. STAFF REPORTS – None.

10. FUTURE AGENDA ITEMS

Any request that requires Board action will be set by the Board for a future agenda or referred to staff.

11. CLOSED SESSION

11.1. CONFERENCE WITH REAL PROPERTY NEGOTIATIONS Pursuant to Government Code § 54956.8 in re: APNs 001-104-001-000, 001-114-006-000, 003-062-027-000, 001-011-021-000, 002-062-008, 002-062-009, and 002-062-005: RCEA negotiator: Executive Director; Owner's negotiating party: Kramer Investment Corporation, Coldwell Banker Pacific Partners, the City of Eureka, and Ming Tree Realtors; Under negotiation: price and terms.

12. RECONVENE TO OPEN SESSION

13. CLOSED SESSION REPORT

14. ADJOURNMENT

NEXT REGULAR MEETING
Thursday, April 22, 2021, 3:30 p.m.
This meeting will be an online teleconference following shelter-in-place orders.

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BOARD OF DIRECTORS MEETING DRAFT MINUTES

February 25, 2021 -Thursday, 3:30 p.m.

Notice of this meeting was posted on February 21, 2021. Chair Sheri Woo called a regular meeting of the Board of Directors of the Redwood Coast Energy Authority to order on the above date at 3:31 p.m., stating that the teleconference meeting was being conducted pursuant to Brown Act waivers included in Governor Newsom's COVID-19 State of Emergency Executive Order N-29-20 of March 17, 2020, and the Humboldt County Health Officer's March 30, 2020, Shelter-in-Place Order. Chair Woo stated that the posted agenda contained public teleconference meeting participation instructions.

PRESENT: Stephen Avis, Chris Curran, Dave Grover, Mike Losey, Sarah Schaefer, Frank Wilson, Mike Wilson, Sheri Woo. ABSENT: Scott Bauer. STAFF AND OTHERS PRESENT: Regulatory and Legislative Policy Manager Aisha Cissna; General Counsel Nancy Diamond; Power Resources Director Richard Engel; The Energy Authority Client Services Specialist Jaclyn Harr; Executive Director Matthew Marshall; Community Strategies Manager Nancy Stephenson; Clerk of the Board Lori Taketa.

REPORTS FROM MEMBER ENTITIES

Director Grover reported that Trinidad will not participate with Humboldt Bay Municipal Water District and the Rancheria in a water study and will install solar panels on the Town Hall.

ORAL COMMUNICATIONS

International Brotherhood of Electrical Workers Local 551 Business Manager John McEntagart submitted written comment expressing concern that RCEA's joining of the CC Power JPA will weaken local control over the terms and types of procurement agreements RCEA enters into and may result in projects inconsistent with community labor and environmental values. Mr. McEntagart's letter listed policies which RCEA should support the CC Power JPA adopting.

The Board was reminded that the Brown Act allows brief responses to public comment but not discussion. Staff offered to place CC Power's policies on a future meeting agenda. Since the community has had the opportunity to adjust to virtual meeting platforms during the pandemic, RCEA meetings will transition back to taking live public comment at meetings and receiving written comment without reading them aloud at meetings. Chair Woo closed the public comment period.

CONSENT CALENDAR

3.1 Approve Minutes of January 28, 2021, Board Meeting.

3.2 Approve Disbursements Report.

3.3 Accept Financial Reports.

3.4 Approve Revisions to the RCEA Fiscal Year 2020-21 Budgets Increasing the Regulatory and Professional Services Budget by $80,000 and Decreasing the Contracts-Program Related Services Budget by $80,000.

3.5 Authorize Staff to Execute an Amendment to the Current Contract with Environmental Indicator Accounting Services to Increase the Not-to-Exceed Contract Budget from $38,828 to $60,353 for Technical Support Through September 2021.

3.6 Approve Master Services Agreement with the Schatz Energy Research Center for Research and Development Services in an Amount Not to Exceed $100,000 and Authorize the Executive Director to Execute All Applicable Documents Pending RCEA Legal Counsel Review.

3.7 Approve Amendment 1 Extending the Term of the Current Legal Services Agreement with Braun Blaising Smith Wynne, P.C. for Regulatory Support and Legal Services in Support of RCEA's CCE Program Through June 2021, and Authorize the Executive Director to Engage and Direct BBSW on Specific Matters as Needed, Subject to Sufficient Budgetary Allocations.

3.8 Adopt Resolution No. 2021-2, Approving and Authorizing Collateral in Connection with Loan "A8" From the United States Department of Agriculture, Rural Utilities Service for Construction of the Redwood Coast – Humboldt County Airport Front of the Meter Backup Energy Storage System Microgrid.

3.9 Adopt Resolution No. 2021-01, Modifying the List of Labor Market Agencies in RCEA's Compensation Policy.

Chair Woo requested that item 3.3, the financial report, be removed from the consent calendar and invited public comment. No member of the public came forward to speak or submitted public comment. Chair Woo closed the public comment period.

M/S: Grover, M. Wilson: Approve all consent calendar items except 3.3.

The motion passed with a unanimous roll call vote. Ayes: Avis, Curran, Grover, Losey, Schaefer, F. Wilson, M. Wilson, Woo. Noes: None. Absent: Bauer.

ITEMS REMOVED FROM CONSENT CALENDAR

Chair Woo inquired about the $6 million "Net Other Income" figure, which is the amount of the airport microgrid USDA Rural Utility Loan. The receipt of these funds has been delayed. The current net revenue exceeds the budget amount because CCE program revenue and expense amounts are not synchronized and fluctuate with seasonal power rates.

Chair Woo invited public comment. No member of the public came forward to speak or submitted public comment. Chair Woo closed the public comment period.

M/S: M. Wilson, Grover: Approve consent calendar item 3.3.

The motion passed with a unanimous roll call vote. Ayes: Avis, Curran, Grover, Losey, Schaefer, F. Wilson, M. Wilson, Woo. Noes: None. Absent: Bauer.

COMMUNITY CHOICE ENERGY (CCE) BUSINESS

Chair Woo confirmed that a quorum was present to conduct CCE business.

OLD CCE BUSINESS

5.1. Quarterly Energy Risk Management update

The Energy Authority Client Services Manager Jaclyn Harr reported on revised CCE program financial forecasts, which are less dire than previously reported to the Board in November.

Factors affecting the program's financial status include:

- Extreme cold in the Midwest which drove up natural gas and electricity prices in California. RCEA was only nominally affected by the 250% price spike because it purchased energy hedges.
- Expected extreme summer heat is increasing projected summer energy prices.
- PG&E generation rates rose more than expected, resulting in higher RCEA generation revenues.
- Overdue debt rates have increased and are projected to increase over the summer. Currently about 9,000 RCEA accounts are behind in payment.
- The Board's decision to scale back environmental targets through short-term contracts for the next one to two years to maintain the CCE program's viability is improving the financial outlook.
- Long-term contracts with the large-scale Sandrini solar, airport microgrid and feed-in tariff projects will come online in the next two years, bringing consistent pricing while exceeding the renewable portfolio standard compliance requirement by 200%.

The directors discussed the California moratorium on electricity service disconnections due to non-payment and state and federal COVID relief packages and if they might help cover RCEA's uncollected customer debt of about $1 million.

Chair Woo invited public comment. No one from the public submitted public comment or asked to speak. Chair Woo closed the public comment period.

M/S: M. Wilson, Grover: Accept quarterly energy risk management report.

The motion passed with a unanimous roll call vote. Ayes: Avis, Curran, Grover, Losey, Schaefer, F. Wilson, M. Wilson. Noes: None. Non-Voting: Woo. Absent: Bauer.

5.2. Biomass Power Purchase Agreement with Humboldt Sawmill Company

Chair Woo recused herself due to a remote conflict of interest. Director Woo is employed by SHN Engineers and Geologists, which performs work for Humboldt Sawmill Company, and is an SHN shareholder. Director Woo does not supervise any employees working with Humboldt Sawmill Company and her interest in the Humboldt Sawmill Company power purchase agreement is remote. Director Frank Wilson also recused himself due to a conflict of interest. He is employed by Humboldt Redwood Company, which is associated with Humboldt Sawmill Company.

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Power Resources Director Richard Engel reported that, per Board direction, staff and Humboldt Sawmill Company (HSC) are discussing making up part of DG Fairhaven's lost local power generation. SB 350 requires at least 65% of RCEA's renewable energy to be provided through contracts of 10 years or longer. The CCE program's current long-term contracts just meet this requirement. Procuring an additional 10% in renewable long-term contracts would help reduce the risk of falling short of that obligation, which could result in significant fines if any of RCEA's contracted projects are delayed. Options under consideration are a longer 10-year HSC contract that either maintains the same purchase price and rises with inflation or allows HSC the flexibility to deliver up to 25% more electricity at a lower unit price. A 10-year HSC contract meets the SB 350 requirements and avoids attempting to secure a new contract with what would most likely be an out-of-area project with long construction lead times. Longer contracts allow for plant improvement investment. HSC requested flexible additional output levels to avoid importing biomass feedstock from its Ukiah operations or needing to rely on other mills for feedstock.

Biomass incineration's emissions and particulate health impacts were discussed, as well as conflicting carbon cycle analyses and California's emission control requirements which were described as strict but imperfect. General Counsel Diamond noted the care taken in drafting the original HSC contract which requires the plant to comply with environmental requirements. HSC has had no issues with meeting those requirements.

The locally-generated electrons Humboldt County actually uses, as opposed to power RCEA procures from outside the area, come from HSC and the Humboldt Bay natural gas plant. Decreased biomass generation results in more natural gas power generation to satisfy local demand. Significant wind energy production would change this reality but is unlikely to occur in the near future. HSC is creating energy from waste that would generate methane if not burned. The carbon impacts of biomass energy and fracked natural gas energy were compared.

The Blue Lake biomass plant's offered price is not competitive with HSC's current price because the plant is unable to provide resource adequacy. The plant's lease with the City of Blue lake will expire prior to the end of a 10-year contract.

Member of the public David O'Neill who represents the Blue Lake biomass plant owners stated his opposition to the staff recommendation to negotiate with HSC. He asked that the Board consider his company's written proposal submitted for the meeting record.

Member of the public Martha Walden stated that a 10-year contract is too long and that there should be flexibility to buy less, not more, biomass energy. There is a need to drastically reduce greenhouse gas emissions in the next nine years and draw down atmospheric carbon, which biomass does not do. The goal will not be achieved with RCEA ratepayers subsidizing the status quo. Natural gas power is preferable when particulates are considered.

Member of the public Wendy Ring opposed the 10-year HSC contract and reminded the Board that the RePower Humboldt plan states that only short-term biomass contracts would be made. The state does not regulate criteria emissions. Greenhouse gas impacts of biomass include forest regrowth which takes time the planet does not have to sequester atmospheric carbon. The Board should taper off biomass energy, which is not dispatchable. Valuing baseload power detracts from development of a flexible grid. The community values the natural gas plant's ability to island more than it values the biomass plant. Biomass plants create higher greenhouse gas

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emissions than do natural gas plants. Dr. Ring requested the Board direct staff not to negotiate an extended contract with HSC unless it is at competitive rates with other clean power sources and tapers to zero over two years following end of current contract.

Member of the public Nancy Ihara agreed with Ms. Walden and Dr. Ring, adding that over 500 scientists and economists have approached national leaders asking to move away from biomass energy use. RCEA should not commit to additional years of biomass.

Vice Chair Avis closed the public comment period. The directors inquired whether data exists comparing fossil fuel energy and biomass energy impacts when studied from extraction to use. Discussion ensued on the complexity of the analysis, including issues such as factoring fuel extraction and transport impacts and assumptions about what happens to biomass if it is not burned. A request was made to approach HSC about solar installation on the mill's roof to utilize the substation infrastructure and to produce energy to help fund a transition away from biomass combustion. Staff was encouraged to include a clause in the HSC contract allowing for renegotiation and lowered energy output if alternate viable uses for the biomass material become available.

The Board requested staff send a letter to Redwood Coast Power LLC, the Blue Lake biomass plant's owners, declining the company's offer at this time. A report from RCEA consultant Michael Furniss and the Community Advisory Committee on alternative biomass uses will be presented to the Board in March.

M/S: M. Wilson, Losey: Direct staff to enter negotiations with Humboldt Sawmill Company for an amendment to the existing power purchase agreement at a reduced price, with flexibility to provide additional energy, and for a term of 2021-2031, to be brought back to the Board for approval at a future meeting.

The motion passed with a roll call vote. Ayes: Avis, Curran, Losey, Schaefer, M. Wilson. Noes: Grover. Absent: Bauer. Recuse: F. Wilson, Woo.

Chair Woo and Director F. Wilson rejoined the meeting at 5:25 p.m.

NEW CCE BUSINESS

6.1 2021 Legislative Update

Regulatory and Legislative Policy Manager Aisha Cissna reported on three bills of interest to RCEA at the state legislature this session.

SB 99, the Community Energy Resilience Act, would fund technical assistance and grant programs for planning, and a resilience manager to develop and implement plans, for distributed solar, microgrids and EV mobile storage. Funding priority would be for proposals that help low-income or disadvantaged communities likely to experience outages and that integrate well with regional climate action plans.
SB 612, the Ratepayer Equity Act, would give CCE customers fair access to the environmental credits associated with legacy power contracts that they are currently paying for through the power charge indifference adjustment, instead of paying for those credits to benefit PG&E.

AB 525 Offshore Wind Generation (Chiu), would require state agencies to develop an implementation plan for offshore wind that sets a goal of 10 GW by 2040, identify wind areas in federal waters to meet this goal, coordinate the state and federal offshore wind permitting processes, plan port improvements for offshore wind development, and support workforce training and energy transmission planning.

Staff engages on CPUC or CEC regulatory proceedings based on RCEA's RePower Humboldt strategic plan and seeks Board direction if the agency's position is unclear. RCEA relies on CalCCA, the CCE program's trade association, to take positions on federal or state legislation. Staff is developing a legislative platform for Board approval that would allow staff to respond quickly to calls for support or opposition to legislation at the state or federal level.

Chair Woo invited public comment. No one from the public submitted public comment or asked to speak. Chair Woo closed the public comment period. Executive Director Marshall clarified that this agenda item should be listed as general RCEA business and the Water District may vote.

M/S: Losey, Grover: Authorize staff to submit a letter of support for Senate Bill 99 (The Community Energy Resilience Act), Senate Bill 612 (Electrical Corporations: Allocation of Legacy Resources), and Assembly Bill 525 (Energy: Offshore Wind Generation).

Authorize the Executive Director to withdraw support if there is a substantive change to current bill language.

The motion passed with a unanimous roll call vote. Ayes: Avis, Curran, Grover, Losey, Schaefer, F. Wilson, M. Wilson, Woo. Noes: None. Absent: Bauer.

END OF COMMUNITY CHOICE ENERGY (CCE) BUSINESS

NEW BUSINESS

8.1. RePower Humboldt Strategic Plan Status Update (Information only)

Executive Director Marshall gave the semi-annual progress report on RePower Humboldt strategic plan initiatives.

- RCEA's regional climate action plan work with the County and cities is progressing.
- The Bureau of Ocean Energy Management is expected to move forward with the Humboldt offshore wind development lease auction this year. RCEA and its project partners will participate.
- RCEA is upgrading its electric vehicle (EV) charging stations, launched an EV rebate program and is training city and county planning staff on new EV charging building codes and permitting, especially in multi-family housing parking lots.
- The airport microgrid solar and battery storage site is being prepared. Construction is scheduled to start this spring.
- Feed-in tariff solar projects are in the permitting process in their proposed jurisdictions. If the projects are successfully permitted, construction can begin.

- RCEA is starting to explore renewable, local power generation for resiliency in Hoopa and Willow Creek in partnership with PG&E, as well as clean power development options to support Samoa peninsula redevelopment projects.
- Power Resources staff is preparing to issue a solicitation for more new, renewable, local power to help make up for the Diablo Canyon nuclear power plant retirement.
- The Demand-Side Management department is launching new programs in 2021 as a CPUC program administrator.
- Rebate programs and CCE-funded citizen sourced programs will begin this spring.
- Staff is in final negotiations with a company that helps battery owners be paid for the use of their stored energy to stabilize the grid. Humboldt County agencies, residents and business owners who reserved over $40 million in state battery storage incentive funds may be able to participate.

There was discussion about whether the County Economic Development Division's smart streets infrastructure initiative can incorporate RCEA's EV infrastructure initiatives.

8.1.1 Rural Regional Energy Network development contract

Demand-Side Management Director Stephen Kullmann reported that RCEA is currently delivering energy efficiency services to the community under three-year contracts and is investigating participation in a Rural Regional Energy Network to provide funding after that time. Regional Energy Networks (RENs) are a CPUC mechanism to administer funds to local government agencies for customer programs. The RuralREN is envisioned to be a collaboration with eight rural agencies serving hard-to-reach communities with an annual budget between $15 and $25 million. RCEA would act as the fiscal administrator and could potentially receive $1.5 to $2 million annually, which would significantly increase the agency's ability to provide services to customers.

Chair Woo invited public comment. No one from the public submitted public comment or asked to speak. Chair Woo closed the public comment period.

M/S: Grover, Avis: Approve Professional Services Agreement with San Joaquin Valley Clean Energy Organization in an amount not to exceed $100,000 for Rural Regional Energy Network business plan development and authorize the Executive Director to execute all applicable documents pending RCEA Legal Counsel review.

The motion passed with a unanimous roll call vote. Ayes: Avis, Curran, Grover, Losey, Schaefer, F. Wilson, M. Wilson, Woo. Noes: None. Absent: Bauer.

Due to the lengthy meeting, the Board agreed to postpone discussion of item 8.2 - Board Meeting Duration/Frequency, and closed session item 11.1 – Conference with Real Property Negotiations. Chair Woo adjourned the meeting at 6:16 p.m.

Lori Taketa
Clerk of the Board

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Accrual Basis

Redwood Coast Energy Authority
Disbursements Report
As of January 31, 2021

Type	Date	Num	Name	Memo	Amount
Liability Check	01/07/2021	ACH	Newport Group	Deferred compensation contributions	-13,282.88
Liability Check	01/08/2021	E-pay	EDD	Payroll taxes	-4,498.43
Liability Check	01/08/2021	E-pay	Internal Revenue Service	Payroll taxes	-22,286.74
Liability Check	01/08/2021	E-pay	EDD	Payroll taxes	-2,840.46
Bill Pmt -Check	01/08/2021	11484	Arcata Technology Center	Site Host Reimbursements	-264.76
Bill Pmt -Check	01/08/2021	11485	Blue Lake Rancheria	Site Host Reimbursement 10/1-12/31/20	-29.90
Bill Pmt -Check	01/08/2021	11486	City of Arcata	Site Host Reimbursement 10/1-12/31/20	-146.61
Bill Pmt -Check	01/08/2021	11487	City of Blue Lake	VOID	0.00
Bill Pmt -Check	01/08/2021	11488	City of Eureka - REVNet	Site Host Reimbursement 10/1-12/31/20	-322.94
Bill Pmt -Check	01/08/2021	11489	City of Trinidad	VOID	0.00
Bill Pmt -Check	01/08/2021	11490	GHD	Site Host Reimbursement 10/1-12/31/20	-82.17
Bill Pmt -Check	01/08/2021	11491	North Coast Unified Air Quality	Site Host Reimbursement 10/1-12/31/20	-328.72
Bill Pmt -Check	01/08/2021	11492	Open Door	Site Host Reimbursement 10/1-12/31/20	-70.55
Bill Pmt -Check	01/08/2021	11493	St. Joseph Hospital	Site Host Reimbursement 10/1-12/31/20	-366.09
Bill Pmt -Check	01/08/2021	11494	City of Blue Lake	Site Host Reimbursement 10/1-12/31/20	-88.51
Bill Pmt -Check	01/08/2021	11495	City of Trinidad	Site Host Reimbursements	-168.90
Bill Pmt -Check	01/08/2021	11496	Bithell, M.	Purchase reimbursement - postage	-10.30
Bill Pmt -Check	01/08/2021	11497	Braun Blaising Smith Wynne	Legal Services - Regulatory - November	-6,495.01
Bill Pmt -Check	01/08/2021	11498	CA Dept. of Tax & Fee Administration	Electrical Energy Surcharge Return Q4 2020	-48,772.85
Bill Pmt -Check	01/08/2021	11499	Chargepoint	ACC bollards, cloud plan, etc.	-41,406.87
Bill Pmt -Check	01/08/2021	11500	City of Eureka-Water	Water service, 11/23-12/22/20	-81.76
Bill Pmt -Check	01/08/2021	11501	Donald Dame	VOID	0.00
Bill Pmt -Check	01/08/2021	11501	FedEx	ResKit shipping	-39.84
Bill Pmt -Check	01/08/2021	11502	Frontier Energy, Inc.	Professional Services - Program Support	-3,784.50
Bill Pmt -Check	01/08/2021	11503	North Coast Cleaning	December monthly cleaning service	-105.00
Bill Pmt -Check	01/08/2021	11504	PG&E EV Account	EV stations November	-480.02
Bill Pmt -Check	01/08/2021	11505	PG&E Utility Account	Office 11/20-12/21/20	-845.25
Bill Pmt -Check	01/08/2021	11506	Ray Morgan Company	Printer Charges: 12/6-1/5/21	-16.85
Bill Pmt -Check	01/08/2021	11507	Recology	December garbage service	-91.71
Bill Pmt -Check	01/08/2021	11508	SEL Engineering Services, Inc.	Professional Services - Microgrid	-100,000.00
Bill Pmt -Check	01/08/2021	11509	Sonoma County Office of Education	Legal Services - Program Support	-280.00
Bill Pmt -Check	01/08/2021	11510	Suddenlink Communications	Internet service	-3,285.84
Bill Pmt -Check	01/08/2021	11511	Times Printing Company	Power Content Label mailers	-25,547.36
Bill Pmt -Check	01/08/2021	11512	WREGIS	Annual Fee - Generator Aggregators	-125.00
Bill Pmt -Check	01/08/2021	11513	VISA	Dec statement 11/21-12/18/20	-2,048.07
Bill Pmt -Check	01/08/2021	11514	Donald Dame	Professional Services Dec 2020	-253.75
Paycheck	01/08/2021	ACH	Employees	Payroll 1/10/21	-52,490.94
Check	01/15/2021	11521	PG&E CCA	ACV Microgrid - PGE MALSR services	-96,754.74
Bill Pmt -Check	01/20/2021	ACH	The Energy Authority	CAISO Invoice #20210106-DEC	-43,986.56
Liability Check	01/22/2021	ACH	Newport Group	Deferred compensation contributions	-11,779.33
Bill Pmt -Check	01/25/2021	ACH	CalPine Corporation	Calpine December 2020 Costs	-73,733.40
Bill Pmt -Check	01/25/2021	ACH	Humboldt Redwood Company	Humboldt Redwood Co. December 2020	-732,887.26
Bill Pmt -Check	01/25/2021	ACH	Snow Mountain Hydro, LLC	Cove plant hydro - DEC 2020	-293.09
Liability Check	01/25/2021	E-pay	EDD	Payroll taxes	-4,649.55
Liability Check	01/25/2021	E-pay	Internal Revenue Service	Payroll taxes	-21,558.26
Liability Check	01/25/2021	E-pay	EDD	Payroll taxes	-2,257.89
Check	01/25/2021	11515-20	NEM Customers	NEM Close Out payments	-2,063.53
Bill Pmt -Check	01/25/2021	11523	AT&T	ACV Microgrid new service/router charges	-2,779.41
Bill Pmt -Check	01/25/2021	11524	Bishop, M.	Purchase reimbursement: security supplies	-12.66
Bill Pmt -Check	01/25/2021	11525	Braun Blaising Smith Wynne	Legal Services - Regulatory - December	-8,620.57
Bill Pmt -Check	01/25/2021	11526	CA Dept. of Tax & Fee Administration	Letter ID: L0009176351	-5,245.21
Bill Pmt -Check	01/25/2021	11527	City of Arcata	December Utility User Tax	-8,816.55
Bill Pmt -Check	01/25/2021	11528	Colonial Life	Colonial Life Premiums January 2021	-499.90
Bill Pmt -Check	01/25/2021	11529	Developed Employment Services, LLC.	Facilities maintenance work	-48.57

Redwood Coast Energy Authority
Disbursements Report
As of January 31, 2021

Type	Date	Num	Name	Memo	Amount
Bill Pmt -Check	01/25/2021	11530	Diamond, Nancy	Legal services	-14,477.20
Bill Pmt -Check	01/25/2021	11531	Environmental Indicator Accounting Srvcs.	Services & support for climate action plan.	-1,920.00
Bill Pmt -Check	01/25/2021	11532	HSU - Sponsored Programs Foundation	Professional Services: COVID energy use	-5,733.72
Bill Pmt -Check	01/25/2021	11533	Liebert Cassidy Whitmore	ERC Membership + Liebert Library	-5,357.00
Bill Pmt -Check	01/25/2021	11534	Michael Furniss	Consulting services 11/1-11/30/20	-20,679.39
Bill Pmt -Check	01/25/2021	11535	NYLEX.net, Inc.	Onsite network support services - January	-3,200.00
Bill Pmt -Check	01/25/2021	11536	Pacific Paper Company	Office supplies	-382.22
Bill Pmt -Check	01/25/2021	11537	PG&E CCA	December CCE Charges	-22,180.41
Bill Pmt -Check	01/25/2021	11538	PG&E EV Account	EV stations December	-258.96
Bill Pmt -Check	01/25/2021	11539	Ray Morgan Company	Printer Charges: 10/6/20-11/5/20	-20.46
Bill Pmt -Check	01/25/2021	11540	Redwood Community Radio	Radio underwriting	-780.00
Bill Pmt -Check	01/25/2021	11541	Times Printing Company	Misc. printing services	-1,280.38
Bill Pmt -Check	01/25/2021	11542	Verizon Wireless	December tablet/cell service	-1,932.50
Bill Pmt -Check	01/25/2021	11543	Winzler, John	Office Lease - November	-6,512.00
Bill Pmt -Check	01/25/2021	11544	City of Arcata	December Excessive Energy Use Tax	-4,114.95
Liability Check	01/25/2021	11545	Umpqua Bank	HSA contributions	-480.65
Liability Check	01/25/2021	11546	Calvert	December 2020 IRA Contributions	-961.87
Paycheck	01/25/2021	ACH	Employees	Payroll 1/25/21	-53,020.07
TOTAL					**-1,490,216.84**

Redwood Coast Energy Authority
Profit & Loss Budget vs. Actual
July 2020 through January 2021

	Jul '20 - Jan 21	Budget	% of Budget
Ordinary Income/Expense			
Income			
5 REVENUE EARNED			
Total 5000 · Revenue - government agencies	85,056.40	737,317.00	11.54%
Total 5100 · Revenue - program related sales	7,321.38	9,000.00	81.35%
Total 5400 · Revenue-nongovernment agencies	407,835.53	1,556,600.00	26.2%
Total 5500 · Revenue - Electricity Sales	29,660,200.37	41,763,500.00	71.02%
Total 5 REVENUE EARNED	30,160,413.68	44,066,417.00	68.44%
Total Income	30,160,413.68	44,066,417.00	68.44%
Gross Profit	30,160,413.68	44,066,417.00	68.44%
Expense			
Total 6 WHOLESALE POWER SUPPLY	23,960,903.02	36,074,000.00	66.42%
Total 7 PERSONNEL EXPENSES	1,496,670.67	2,838,644.00	52.73%
Total 8.1 FACILITIES AND OPERATIONS	568,068.53	6,606,484.00	8.6%
Total 8.2 COMMUNICATIONS AND OUTREACH	58,931.77	114,000.00	51.7%
Total 8.3 TRAVEL AND MEETINGS	18.30	18,450.00	0.1%
8.4 PROFESSIONAL & PROGRAM SRVS			
8400 · Regulatory	117,056.00	120,000.00	97.55%
8410 · Contracts - Program Related Ser	124,134.49	406,000.00	30.58%
8420 · Accounting	19,200.00	75,000.00	25.6%
8430 · Legal	85,068.10	125,000.00	68.05%
8450 · Wholesale Services - TEA	360,142.09	620,500.00	58.04%
8460 · Procurement Credit - TEA	394,114.52	650,500.00	60.59%
8470 · Data Management - Calpine	514,753.80	913,450.00	56.35%
Total 8.4 PROFESSIONAL & PROGRAM SRVS	1,614,469.00	2,910,450.00	55.47%
Total 8.5 PROGRAM EXPENSES	326,768.99	627,550.00	52.07%
Total 8.6 INCENTIVES & REBATES	13,449.48	601,000.00	2.24%
Total 9 NON OPERATING COSTS	37,995.25	35,500.00	107.03%
Total Expense	28,077,275.01	49,826,078.00	56.35%
Net Ordinary Income	2,083,138.67	-5,759,661.00	-36.17%
Net Other Income	0.00	6,000,000.00	0.0%
Net Income	**2,083,138.67**	**240,339.00**	**866.75%**

Redwood Coast Energy Authority
Balance Sheet
As of January 31, 2021

	Jan 31, 21
ASSETS	
Current Assets	
Checking/Savings	
1010 · Petty Cash	493.22
1050 · GRANTS & DONATIONS 3840	15,204.58
1060 · Umpqua Checking Acct 0560	650,160.12
1071 · Umpqua Deposit Cntrol Acct 8215	9,394,359.83
1075 · Umpqua Reserve Account 2300	2,000,000.00
8413 · COUNTY TREASURY 3839	5,065.52
Total Checking/Savings	12,065,283.27
Total Accounts Receivable	237,344.46
Other Current Assets	
1101 · Allowance for Doubtful Accounts	-1,062,092.09
1103 · Accounts Receivable-Other	9,260,861.18
1120 · Inventory Asset	21,715.00
1202 · Prepaid Expenses	-55,319.57
1210 · Retentions Receivable	1,001.00
1499 · Undeposited Funds	51,502.00
Total Other Current Assets	8,217,667.52
Total Current Assets	20,520,295.25
Total Fixed Assets	151,725.39
Other Assets	
1700 · Retained Deposits	1,955,880.00
Total Other Assets	1,955,880.00
TOTAL ASSETS	**22,627,900.64**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Total Accounts Payable	4,710,913.80
Total Credit Cards	-559.23
Other Current Liabilities	
2013 · Unearned Revenue - PA 2020-2023	1,741,610.75
Total 2100 · Payroll Liabilities	121,780.99
Total Other Current Liabilities	1,863,391.74
Total Current Liabilities	6,573,746.31
Total Liabilities	6,573,746.31
Equity	
2320 · Investment in Capital Assets	151,725.38
3900 · Fund Balance	13,819,290.28
Net Income	2,083,138.67
Total Equity	16,054,154.33
TOTAL LIABILITIES & EQUITY	**22,627,900.64**

REDWOOD COAST Energy Authority

STAFF REPORT
Agenda Item # 3.4

AGENDA DATE:	March 25, 2021
TO:	Board of Directors
PREPARED BY:	Lori Biondini, Director of Business Planning & Finance
SUBJECT:	Calpine Energy Solutions Data Management Services Contracts

SUMMARY

In January 2021, staff was authorized to negotiate a contract extension with Calpine Energy Solutions for data management services and bring the agreement to the Board for final approval prior to execution. The resulting agreement is very agreeable to staff and includes the following changes:

- Removed references to the CCE program launch phase services no longer applicable to the relationship with Calpine.
- The term of the agreement is for five years and shall automatically renew for successive one-year periods unless cancelled by either party 180-days prior to the automatic renewal date.
- There is an early termination option after three years for a fee of $70,000 which represents the per meter savings associated with the five-year term option.
- Updated/increased insurance limits.
- Structured service offerings based on a refined knowledge of RCEA's (and other CCA) data management needs at a lower per meter price ($0.96) rather than the previous price ($1.15) that accommodated RCEA's developing operational needs during the CCE launch period.
- Qualified Reporting Entity services are included and referenced in the Professional Services Agreement but the full terms of those services remain in a separate agreement.

The most significant change is that Calpine will no longer be providing live agent customer call center services. RCEA will retain the Interactive Voice Response (IVR) phone recordings that allow customers to call a toll-free number and go through a self-service menu 24 hours a day, 7 days a week. There will instead be an option to be forwarded to RCEA's office in Eureka where a live person will answer during RCEA's regular business hours, or they may leave a voice message. This change was initiated by staff, taking into consideration that paying Calpine to provide live agents in San Diego who, although very well trained and providing a service-level guarantee, may not be more helpful than a locally-based RCEA employee. Staff have analyzed reports from Calpine and determined that the call center has been fielding one call per hour on average between 8 and 4 p.m. on behalf of RCEA. Average length of the calls are 4.40 minutes, and most are labeled "billing inquiry," "general info," or "opt out inquiry." RCEA's current level of staffing would be able to handle the additional calls based on this data, however, the associated cost savings may accommodate the hiring of additional front-office support if the resulting call volume at RCEA's office requires it.

FINANCIAL IMPACTS

Based on the number of meters RCEA served in February 2021, the new agreement with Calpine

represents a savings of $145,894.92 per year compared to current costs with no loss of service quality. The savings decreases by $23,333 per year if RCEA terminates the contract after three years.

RECOMMENDED ACTION

Approve Professional Services Agreement and Qualified Reporting Entity Services Agreement with Calpine Energy Solutions LLC and Authorize the Executive Director to Execute the Agreements and All Associated Documents as Necessary, Contingent on Final Review and Approval by RCEA Legal Counsel.

ATTACHMENTS

1. Draft Professional Services Agreement
2. Draft Qualified Reporting Entity Services Agreement

PROFESSIONAL SERVICES AGREEMENT

This Professional Services (the "Agreement") is entered into effective the First day of April, 2021 (the "Effective Date"), by and between Calpine Energy Solutions LLC, a California limited liability company ("Contractor") and Redwood Coast Energy Authority, a joint powers authority ("RCEA"). Each party listed above may be referred to individually as a "Party," and collectively as the "Parties."

WITNESSETH

WHEREAS, RCEA operates a Community Choice Aggregation ("CCA") program for its RCEA Members and their respective residents (the "Program"); and

WHEREAS, RCEA purchases electricity for the Program from one or more electric energy suppliers ("Supplier").

WHEREAS, Contractor has provided data manager services in support of RCEA's CCA Program since 2016 pursuant to a Professional Services Agreement dated April 1, 2016, subject to Addendum No.1 dated December 1, 2016, Addendum No. 2 dated May 1, 2018, and Amendment No. 1 dated July 1, 2018 (collectively, "Prior Agreement"); and

WHEREAS, pursuant to the scope of services provided in the Prior Agreement, Contractor also provides Qualified Reporting Entity (QRE) services for RCEA under a separate QRE Services Agreement; and

WHEREAS, Addendum No. 2 expired on October 31, 2018, and the remaining portions of the Prior Agreement and QRE Services Agreement expire on April 1, 2021; and

WHEREAS, Contractor has the demonstrated qualifications, skills and training necessary to continue providing certain data management services needed by RCEA, and the Parties desire to enter into a new data manager agreement on the terms and conditions below.

NOW, THEREFORE, for and in consideration of the mutual benefits, obligations, covenants, and consideration, the receipt and sufficiency of which are hereby acknowledged, Contractor and RCEA hereby agree as follows:

1. **SERVICES**. Subject to the terms and conditions of this Agreement and during the term of this Agreement, Contractor shall provide to RCEA the services described in Exhibit A, attached hereto and incorporated herein ("Services,").

2. **CONDITIONS TO CONTRACTOR'S PERFORMANCE**.

(a) Information and Assistance. Upon Contractor's reasonable request, RCEA shall provide such information and assistance as is reasonably required for Contractor

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to provide the Services. If RCEA fails to provide Contractor with such requested information or assistance then Contractor shall continue to provide in a timely manner any such portion(s) of the affected Services that Contractor can reasonably provide to the extent possible in the absence of such information or assistance. Notwithstanding any provision to the contrary herein, failure by RCEA to provide Contractor with such information or assistance shall not constitute an Event of Default; provided, however, that Contractor's performance or lack of performance under this Agreement shall be excused to the extent that it is hindered, prevented or impacted as a result of RCEA's failure or inability to provide such information or assistance.

(b) Notification. RCEA shall notify all other relevant parties, including but not limited to Supplier, and RCEA's lender(s), as necessary, of the existence of this Agreement and Contractor's role as contemplated in this Agreement.

3. **FEES AND BILLING**.

(a) Fees. RCEA shall pay all fees due in accordance with Exhibit B, attached hereto and incorporated herein.

(b) Billing and Payment Terms. Contractor shall submit an itemized invoice to RCEA monthly for all fees related to Services performed during the previous month to RCEA, 633 3rd Street, Eureka CA 95501, Attention: Accounting, or emailed to accounting@redwoodenergy.org. Payment shall be due within thirty (30) days after the date of invoice. All payments must be made in U.S. dollars. Late payments hereunder shall accrue interest at the lower of the rate of one percent (1%) per month, or the highest rate allowed by law.

(c) Taxes. Payments due to Contractor under this Agreement shall be net of all sales, value-added, use or other taxes and obligations.

4. **REPRESENTATIONS AND WARRANTIES**. On the Effective Date, each Party represents and warrants to the other Party that: (i) it is duly organized, validly existing and in good standing under the laws of the jurisdiction of its formation; (ii) it has all regulatory authorizations necessary for it to legally perform its obligations under this Agreement; (iii) the execution, delivery and performance of this Agreement are within its powers, have been duly authorized by all necessary action and do not violate any of the terms and conditions in its governing documents, any contracts to which it is a party or any law, rule, regulation, order or the like applicable to it; (iv) this Agreement and each other document executed and delivered in accordance with this Agreement constitutes its legally valid and binding obligation enforceable against it in accordance with its terms; (v) it is not bankrupt and there are no proceedings pending or being contemplated by it or, to its knowledge, threatened against it which would result in it being or becoming bankrupt, and (vi), in the case of Contractor, that it has the qualifications, experience and ability to perform the Data Manager Services described in Exhibit A.

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5. **INDEMNIFICATION**. Each party to this Agreement (each an "Indemnifying Party") agrees, to the fullest extent permitted by law, to indemnify, hold harmless, protect and defend the other party (the "Indemnified Party"), and the Indemnified Party's governing board, supervisors, officers, directors, agents, employees, and/or volunteers from and against any and all liabilities, actions, claims, damages, disabilities, or expenses that may be asserted by any person or entity, to the extent resulting from the Indemnifying Party's breach of any material term of this Agreement, or the Indemnifying Party's negligence or willful misconduct in connection with the performance of this Agreement, but excluding liabilities, actions, claims, damages, disabilities, or expenses to the extent arising from the Indemnified Party's breach of any material term of this Agreement, or the Indemnified Party's negligence or willful misconduct in connection with the performance of this Agreement. The Indemnified Party shall have the right to select its legal counsel at the Indemnifying Party's expense, subject to the Indemnifying Party's approval, which shall not be unreasonably withheld, conditioned or delayed. For purposes of this Article, each Indemnifying Party shall be responsible for the negligent acts and/or omissions and/or willful misconduct of any person or entity over which it exercises direction and control, including without limitation, subcontractors and employees. Each Party's indemnification obligations under this Article are conditioned upon the Indemnified Party: (i) promptly notifying the Indemnifying Party of any claim in writing; (ii) cooperating with the Indemnifying Party in the defense of the claim; and (iii) granting the Indemnifying Party sole control of the defense or settlement of the claim. The indemnity obligation set forth in this Section 5 shall survive termination of this Agreement.

6. **TERM**. Subject to compliance with all terms and conditions of this Agreement, the term ("Term") of this Agreement shall become effective on the Effective Date and shall continue, unless terminated earlier in accordance with the terms of this Agreement, until April 30, 2026. Thereafter, the term of this Agreement shall automatically renew for successive one (1) year terms, running from May 1 to April 30 of each subsequent twelve (12) month period, (each a "Renewal Term") unless one Party provides written notice to the other Party at least one hundred eighty (180) calendar days in advance of the end of the then existing Term or Renewal Term that it does not wish to renew this Agreement.

7. **TERMINATION**.

(a) Termination for Cause. If any one of the following events (each an "Event of Default") occurs with respect to a Party, then the other Party may terminate this Agreement upon written notice to the defaulting Party: (i) with respect to RCEA, RCEA fails to pay amounts due hereunder and such failure continues for seven (7) business days following written notice from Contractor; (ii) either Party defaults in the observance or performance of any of its material covenants or agreements in this Agreement and such default continues uncured for twenty (20) business days following written notice to the defaulting Party; or (iii) either Party makes an assignment for the benefit of creditors (other than a collateral assignment to an

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entity providing financing to such Party), files a petition or otherwise commences, authorizes or acquiesces in the commencement of a proceeding or cause under any bankruptcy or similar law for the protection of creditors or has such a petition filed against it or otherwise becomes bankrupt or insolvent (however evidenced), or is unable to pay its debts as they fall due.

(b) Termination for Convenience**.** RCEA may terminate this Agreement for its own convenience, effective April 1, 2024 by (i) providing written notice such that it is received by Calpine in good order on or before November 1, 2023, and (ii) paying a fee of $70,000.

(c) Effect of Termination. Upon the effective date of expiration or termination of this Agreement: (i) Contractor shall immediately cease providing Services hereunder; and (ii) any and all payment obligations of RCEA under this Agreement, including, without limitation, any and all fees related to the Services for the balance of the term, will become due within thirty (30) days; provided, however, that in the event that Contractor is the defaulting Party, RCEA shall have the right to deduct or set off against any part of the balance due to Contractor any amount due from Contractor under this Agreement. Upon such expiration or termination, and upon request of RCEA, Contractor shall reasonably cooperate with RCEA to ensure a prompt and efficient transfer of all data, documents and other materials to RCEA or a new services provider, in a form as directed by RCEA, in a manner such as to minimize the impact of expiration or termination on RCEA's customers. If RCEA is the defaulting Party, RCEA agrees to pay Contractor reasonable compensation for additional services performed in connection with such transfer, to the extent not otherwise provided for or contemplated in this Agreement.

8. **LIMITATION ON DAMAGES**. FOR ANY BREACH HEREOF, LIABILITY SHALL BE LIMITED TO DIRECT, ACTUAL DAMAGES ONLY, SUCH DIRECT, ACTUAL DAMAGES SHALL BE THE SOLE AND EXCLUSIVE REMEDY, AND ALL OTHER REMEDIES OR DAMAGES AT LAW OR IN EQUITY ARE WAIVED. NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF OR RELATED TO THIS AGREEMENT, INCLUDING LOST PROFITS OR BUSINESS INTERRUPTION DAMAGES, WHETHER BASED ON STATUTE, CONTRACT, TORT, UNDER ANY INDEMNITY, INCLUDING ANY CLAIMS FOR MONETARY PENALTIES ASSESSED BY THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR ASSOCIATED WITH THE SETTLEMENT QUALITY METER DATA REPORTING OR OTHERWISE, WITHOUT REGARD TO CAUSE OR THE NEGLIGENCE OF ANY PARTY, WHETHER SOLE, JOINT, ACTIVE OR PASSIVE, AND EACH PARTY HEREBY RELEASES THE OTHER PARTY FROM ANY SUCH LIABILITY, EVEN IF DURING THE TERM HEREOF IT ADVISES THE OTHER OF THE POSSIBILITY OF SUCH DAMAGES. TO THE EXTENT ANY DAMAGES REQUIRED TO BE PAID HEREUNDER ARE LIQUIDATED, THE PARTIES ACKNOWLEDGE THAT THE DAMAGES ARE DIFFICULT OR IMPOSSIBLE TO DETERMINE, OR OTHERWISE OBTAINING AN ADEQUATE REMEDY IS INCONVENIENT AND

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THE DAMAGES CALCULATED HEREUNDER CONSTITUTE A REASONABLE APPROXIMATION OF THE HARM OR LOSS. THE FOREGOING LIMITATIONS SHALL NOT APPLY TO ANY CLAIM ARISING FROM A BREACH OF THE CONFIDENTIALITY PROVISIONS OF SECTION 13 OR THE INDEMNIFICATION PROVISIONS OF SECTION 5 OF THIS AGREEMENT. NOTWITHSTANDING ANYTHING TO THE CONTRARY IN THIS AGREEMENT, WITH THE EXPRESS EXCLUSION OF ANY CLAIM FOR INDEMNITY OR BREACH OF CONFIDENTIALITY, IN NO EVENT SHALL CONTRACTOR'S LIABILITY TO RCEA HEREUNDER EXCEED THE AMOUNT OF THE FEES PAID TO CONTRACTOR BY RCEA FOR THE SERVICES PROVIDED HEREUNDER. THE PROVISIONS OF THIS ARTICLE 8 SHALL APPLY TO THE FULLEST EXTENT PERMITTED BY LAW.

9. **FORCE MAJEURE EVENT**. A Party shall be excused from performance under this Agreement and shall not be considered in default with respect to any obligation hereunder (other than obligations to pay money), if, and to the extent, its failure of, or delay in, performance is due to a Force Majeure Event; provided, however, that (a) such claiming Party gives written notice and full particulars of such Force Majeure Event to the other Party promptly after the occurrence of the event relied on, (b) such notice shall estimate the expected duration and probable impact on the performance of such Party's obligations hereunder, (c) such affected Party shall continue to furnish timely regular reports with respect thereto during the continuation of the delay in the affected Party's performance, (d) the suspension of such obligations sought by such Party is of no greater scope and of no longer duration than is required by the Force Majeure Event, (e) no obligation or liability of either Party which became due or arose before the occurrence of the event causing the suspension of performance shall be excused as a result of the occurrence; (f) the affected Party shall exercise all commercially reasonable efforts to mitigate or limit the interference, impairment and losses to the other Party by promptly taking appropriate and sufficient corrective action; (g) when the affected Party is able to resume performance of the affected obligations under this Agreement, the affected Party shall give the other Party written notice to that effect, and (h) the affected Party promptly shall resume performance under this Agreement. The term "Force Majeure Event" means the occurrence of any event beyond the reasonable control of the Party affected that results in the failure or delay by such Party of some performance under this Agreement, in full or part, including but not limited to the following: drought, flood, earthquake, storm, fire, volcanic eruption, lightning, epidemic, war, pests, riot, civil disturbance, sabotage, terrorism or threat of terrorism, strike or labor difficulty, accident or curtailment of supply or equipment, total casualty to equipment, or restraint, order or decree by a governmental authority. Notwithstanding the foregoing, Force Majeure Events shall expressly not include lack of financial resources, material cost increases in commodities or labor, or other economic conditions.

10. **RELATIONSHIP OF PARTIES**. Contractor and RCEA are independent contractors and this Agreement will not establish any relationship or partnership, joint venture, employment franchise or agency between Contractor and RCEA. Neither Contractor nor RCEA will have the power to bind the other or incur obligations on the other's behalf without the other's prior written consent, except as otherwise expressly provided for herein.

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11. **ASSIGNMENT OF RIGHTS**. Neither Party shall assign any of its rights or delegate any of its responsibilities hereunder without first obtaining the consent of the other Party, except it may be assigned or transferred without such consent (i) by either Party to a successor acquiring all or substantially all of the shares and/or the assets of the transferring Party, whether by merger or acquisition, or (ii) by either Party to any wholly-owned affiliate; provided however, that in the event of such a non-consent transfer, notice shall be given to the other Party within 45 days after the conclusion of the transfer memorializing the transfer and identifying the successor in interest. Any request for consent to assign shall be made in writing and the consent, if any, shall be made in writing. Any transfer in violation of this provision shall be void.

12. **FURTHER ACTIONS**. The Parties agree to take all such further actions and to execute such additional documents as may be reasonably necessary to effectuate the purposes of this Agreement.

13. **CONFIDENTIALITY**.

(a) This Agreement and all information shared between the Parties regarding this Agreement and the Services to be provided hereunder (e.g., reports, etc.) is strictly confidential and shall not be disclosed by a Party (except to such Party's affiliates, employees, lenders, counsel and other advisors, permitted assignees, or prospective purchasers who have a need to know the information and have agreed to treat such information as confidential) without the prior written consent of the other Party, except as required by Law, including but not limited to the California Public Records Act and the Brown Act; provided, however, that Contractor expressly reserves all right, whether in law, equity or otherwise, to contest any such disclosure. In addition, Contractor shall comply with the requirements of the customer information confidentiality policy adopted by RCEA, and shall take commercially reasonable efforts to ensure that such data remains confidential.

(b) Contractor acknowledges that the confidential information about RCEA's customers to which it will have access under this Agreement could give it or a third party an unfair competitive advantage in the event that Contractor or any third party were to compete with RCEA in the provision of electrical or other services to RCEA's customers. CONTRACTOR AGREES THAT IT WILL NOT USE ANY INFORMATION IT RECEIVES REGARDING RCEA CUSTOMERS FOR ANY PURPOSE OTHER THAN PROVIDING SERVICES UNDER THIS AGREEMENT. Contractor agrees not to use any of the CCA data provided to it by RCEA for its own marketing purposes. Contractor shall not use such customer information to compete with RCEA in any manner, except as provided herein below. Upon termination of this Agreement, Contractor shall (i) return all documents and other materials received from the RCEA and all copies (if any) of such documents and tangible materials, and (ii) destroy all other documents or materials in Contractor's possession that

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contain RCEA customer data, and (iii) deliver to RCEA a certificate, signed by an authorized representative of Contractor, stating that Contractor has returned or destroyed all such documents and materials; provided, however, that Contractor may retain copies of information necessary for tax, billing or other financial purposes, to be used solely for such purposes. **Notwithstanding anything in the foregoing to the contrary, however**, Contractor is not prohibited from conducting its business with potential customers in RCEA's territory, either due to a business opportunity already known to Contractor as of the date of this Agreement, or made known to Contractor in the ordinary course of Contractor's business other than Services under this Agreement. For the avoidance of doubt, any information, including but not limited to customer names, usage, data, etc., that Contractor receives from a third party in the ordinary course of Contractor's business other than performance of the Services under this Agreement, shall not be deemed to be confidential information as between RCEA and Contractor, for purposes of this Agreement, even if it is the same or similar information such as would be confidential information pursuant to this Agreement.

(c) The Parties agree that money damages would be an inadequate remedy for breach of the provisions in this Section 13 and that either Party shall be entitled to seek equitable relief in connection therewith, and shall be entitled to recover any damages for such breach as may be provided by law.

(d) Exclusion for CCA Program customer account, usage and billing information. RCEA retains sole ownership of, and has full access to (as reasonably requested from Contractor), account, usage and billing information for customers of the CCA Program. RCEA may share all such data with its Supplier or other parties and will assume full responsibility for compliance with customer data protection requirements in doing so. At the termination of this Agreement, Contractor shall provide to RCEA all such information and data requested by RCEA in an electronic format as kept in the ordinary course of business, and as reasonably agreed to by the Parties.

14. **COMPLIANCE WITH LAW**. Each Party shall be responsible for compliance with all laws or regulations applicable to the Services being provided under this Agreement. If either Party's activities hereunder become subject to law or regulation of any kind, which renders the activity illegal, unenforceable, or which imposes additional costs on such Party for which the Parties cannot mutually agree upon an acceptable price modification, then such Party shall at such time have the right to terminate this Agreement upon written notice to the other Party with respect to the illegal, unenforceable, or uneconomic provisions only; the remaining provisions of this Agreement will remain in full force and effect. Any such termination shall not constitute a basis for termination for cause as defined in Section 7, above.

15. **CHOICE OF LAW**. This Agreement, and the rights and duties of the Parties arising hereunder, shall be governed by and construed in accordance with the laws of the State of

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California, without giving effect to any choice of law rules that may require the application of the laws of another jurisdiction.

16. **INTEGRATION**. This Agreement contains the complete understanding between the Parties, supersedes all previous discussions, communications, writings and agreements related to the subject matter of this Agreement, and, except to the extent otherwise provided for herein, may not be amended, modified or supplemented except in a writing signed by both Parties.

17. **WAIVER**. No waiver by either Party of any right or obligation hereunder, including in respect to any Default by the other Party, shall be considered a waiver of any future right or obligation, whether of a similar or different character. Any waiver shall be in writing.

18. **GOVERNMENTAL ENTITY**. RCEA shall not claim immunity on the grounds of sovereignty or similar grounds from enforcement of this Agreement. RCEA's failure to obtain any necessary budgetary approvals, appropriations, or funding for its obligations under this Agreement shall not excuse RCEA's performance hereunder.

19. **NOTICES**. All notices and other communications required under this Agreement shall be in writing and may be delivered by hand delivery, United States mail, overnight courier service, facsimile or email and shall be deemed to have been duly given (i) on the date of service, if served personally on the person to whom notice is to be given, (ii) on the date of service if sent by facsimile or email, provided the original is concurrently sent by first class mail, and provided that notices received by facsimile or email after 5:00 p.m. shall be deemed given on the next Business Day, (iii) on the next Business Day after deposit with a recognized overnight delivery service, or (iv) on the third (3rd) day after mailing, if mailed to the party to whom notice is to be given by first class mail, registered or certified, postage-prepaid, and properly addressed as follows:

If to Contractor:	Calpine Energy Solutions LLC Attn: Legal Dept. 401 West A Street, Suite 500 San Diego, CA 92101 619-684-8251 (Phone) 619-684-8350 (Fax)
If to RCEA:	Redwood Coast Energy Authority Matthew Marshall, Executive Director 633 3rd Street Eureka, CA 95501 707-269-1700 (Phone)
With Copies to:	Nancy Diamond, Esq.

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RCEA General Counsel
822 G. Street, Suite 3
Arcata, CA 95521

20. **TIME**. Time is of the essence of this Agreement and each and all of its provisions. The parties agree that the time for performance of any action permitted or required under this Agreement shall be computed as if such action were "an act provided by law" within the meaning of California Civil Code §10, which provides: "The time in which any act provided by law to be done is computed by excluding the first day and including the last unless the last day is a holiday, and then it is also excluded."

21. **LIMITATIONS**. Nothing contained in this Agreement shall in any way limit Contractor from marketing any of its products and services outside of RCEA's service territory, or within it as described in 13.b, above.

22. **THIRD PARTY BENEFICIARIES**. The Parties agree that there are no third-party beneficiaries to this Agreement either expressed or implied.

23. **INSURANCE.** With respect to performance of services under this Agreement, Contractor shall maintain and shall require any subcontractor performing Call Center or other functions as described in the Agreement, to maintain, at a minimum, the insurance coverage or self-insurance coverage as described below at all times during the term of this Agreement. Failure to maintain the required insurance shall be a breach of the Agreement.

(a). All insurance carriers shall have an A.M. Best's rating of A- or better and a minimum financial size VII. Said coverage shall include an endorsement to add RCEA, its officers, agents and employees, as additional insureds with respect to liability arising out of or connected with the services to be provided under this Contract. Said coverage shall additionally be endorsed to specify that the Contractor's insurance is primary and that insurance or self-insurance maintained by RCEA shall not contribute with it. Upon request, Contractor shall furnish RCEA with certificates of insurance of all required insurance. Contractor shall provide thirty (30) days advance written notice of cancellation to RCEA. In the event Contractor subcontracts any part of the Services, each subcontractor shall be bound by the same terms and conditions concerning insurance as required by this Agreement will be made a part of any such subcontract agreement.

(b). Workers' Compensation and Employers' Liability Insurance: Contractor shall maintain workers' compensation insurance with statutory limits, and employer's liability insurance with limits of $1,000,000 per occurrence.

(c). Commercial General Liability: Contractor shall maintain $2 million per occurrence and in the aggregate commercial general liability insurance coverage, including

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products and completed operations, property damage, bodily injury and personal and advertising injury.

(d). Professional or Errors and Omissions Insurance: Contractor shall maintain such Professional or Errors and Omissions Insurance as will provide protection from any claim arising out of any negligent act, error or omission in rendering or failing to render professional services either committed or alleged to have been committed by Contractor or by anyone employed by Contractor to perform or furnish any of the Services, or by anyone for whose acts any of them may be liable. Such coverage shall not be less than $2,000,000 single limit, any one claim and $2,000,000 annual aggregate.

(e). Technology Professional Liability Errors and Omissions Insurance: Contractor shall maintain Technology Professional Liability Errors and Omissions Insurance with limits not less than $2,000,000 per occurrence. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by Contractor in this agreement and shall include, but not be limited to, claims involving infringement of intellectual property, copyright, trademark, invasion of privacy violations, information theft, release of private information, extortion and network security. The policy shall provide coverage for breach response costs as well as regulatory fines and penalties as well as credit monitoring expenses with limits sufficient to respond to these obligations.

The policy shall include, or be endorsed to include, property damage liability coverage for damage to, alteration of, loss of, or destruction of electronic data and/or information "property" of RCEA in the care, custody, or control of Contractor. If not covered under Contractor's liability policy, such "property" coverage of RCEA may be endorsed onto Contractor's Cyber Liability Policy as covered property as follows:

Cyber Liability coverage with limit of liability in the amount of $20,000,000 to cover the damage to, alteration of, loss of, or destruction of electronic data and/or information "property" of RCEA that will be in the care, custody, or control of Contractor.

(f). Self-Insurance: If Contractor is self-insured, Contractor shall forward documentation to RCEA that demonstrates to RCEA's satisfaction that Contractor self-insures as a matter of normal business practice before commencing work under this Contract. RCEA will accept reasonable proof of self-insurance comparable to the above requirements.

24. **ATTORNEYS' FEES.** In the event that an action, suit or other proceeding is brought to enforce or interpret this Agreement or any part hereof or the rights or obligations of any Party to this Agreement, the prevailing Party will be entitled to recover from the other Party reasonable

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attorneys' fees and direct out-of-pocket costs and disbursements associated with the dispute that are incurred by the prevailing party.

25. **NONDISCRIMINATORY EMPLOYMENT.** In connection with the execution of the Agreement, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, age, sex, national origin, political affiliation, ancestry, marital status or disability. This policy does not require the employment of unqualified persons.

26. **HEADINGS.** The headings of this Agreement are for purposes of reference only and shall not limit or define the meaning of the provisions of this Agreement.

27. **SEVERABILITY.** If any paragraph, section, sentence, clause or phrase contained in this Agreement shall become illegal, null or void or against public policy, for any reason, or shall be held by any court of competent jurisdiction to be illegal, null or void or against public policy, the remaining paragraphs, sections, sentences, clauses or phrases contained in this Agreement shall not be affected thereby.

31. **CONTRACT ADMINISTRATORS.** Each Party shall appoint a contract administrator that will be responsible for administering this Agreement including having the authority to transmit instructions, receive information, and implement the Agreement on behalf of the respective party (the "Contract Administrator"). The Contract Administrators shall be identified in this Agreement. Either Party may change its respective Contract Administrator by giving advance written notice to the other Party, consistent with the terms of the Notice Section of this Agreement.

Contract Administrator:

RCEA:	**Calpine:**
Matthew Marshall, Executive Director	Drake Welch, Vice President
(707) 269-1700	619-614-8039
mmarshall@redwoodenergy.org	dwelch@calpinesolutions.com

32. **WARRANTY OF AUTHORITY.** Each Party represents and warrants to the other Party that it is and will remain duly organized, validly existing, and in good standing under the laws of the state of its organization throughout the term of this Agreement, and that the execution, delivery and performance of this Agreement are within its express or implied statutory powers, have been duly authorized by all necessary action, and do not violate any of the terms or conditions in its governing documents or applicable laws.

33. **COUNTERPARTS**. This Agreement may be executed in counterparts, each of which will be considered an original, but all of which will constitute one and the same agreement. Facsimile,

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portable document format (pdf), and verified electronic signatures shall be binding as if an original.

IN WITNESS WHEREOF, the Parties hereto have executed the Agreement as of the Effective Date provided herein

Calpine Energy Solutions LLC	Redwood Coast Energy Authority
By:	By:
Name: Jim Wood	Name: Sheri Woo
Title: President	Title: Chair of the Board
Date:	Date:
	ATTEST:
	By:
	Name: Lori Taketa
	Title: RCEA Board Clerk
	Date:

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Exhibit A:

Scope of Services

I. **Definitions.** As used in this Exhibit A, the following terms used and not otherwise defined in this Exhibit A shall have the following meanings:

1. "Ad Hoc Request" or "Ad Hoc" refers to services, including: new services, additional services or significant modifications to current services, requested by RCEA that fall outside the scope of what Calpine is contractually obligated to provide under the terms of this Agreement.

2. "Billing Window" refers to the period starting on the meter read date and ending 10 calendar days later. Submission of bill data must occur during this period for the CCA charges to appear on the consolidated PG&E bill.

3. "Billing Determinants" are used in the Rate Schedule to calculate the charge or credit due. Billing Determinants can define a time period, as in the case of Time-Of-Use rates that have various significance periods such as on-peak, off-peak, mid-peak, etc., or can be defined as factors that are to be considered when calculating the final customer charge such as discount services or additional charges that deviate from the Rate Schedule's standard structure, among others.

4. "Billing Error" refers to the incorrect billing of an account due to an error by Calpine. This does not include errors caused by incorrect or incomplete data provided by PG&E.

5. "Business Day" means all calendar days other than those days on which the Federal Reserve member banks in New York City are authorized or required by law to be closed, and shall be between the hours of 8:00 a.m. and 5:00 p.m. Pacific Prevailing Time for the relevant Party's principal place of business where the relevant Party, in each instance unless otherwise specified, shall be the Party from whom the Notice, payment or delivery is being sent and by whom the Notice or payment or delivery is to be received.

6. "CARE" refers to the California Alternate Rates for Energy program administered by PG&E which provides discounts on energy bills for income qualified households designated by PG&E.

7. "Community Choice Aggregation/Aggregator" or ("CCA") refers to local government entities or joint powers agencies whose governing boards have elected to acquire and provide electric power and energy services to utility end-use customers located within their service area(s), as set forth in California Public Utilities Code Section 366.2 and other California Public Utilities Commission (CPUC) directives.

8. "Contact Center Service" means inbound call coverage for Business Continuity Events or coverage events where 2 (two) days' notice is provided by RCEA, including: updating call queue, agent allocation, and using commercially reasonable efforts to provide available agents for inbound call coverage. Contact Center Service does not include inbound email coverage.

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9. “CCA Service” means the sale of retail electric power by a Community Choice Aggregator, to utility end-use customers located within its service area(s), as set forth in California Public Utilities Code Section 366.2 and other California Public Utilities Commission (CPUC) directives.

10. “CCA Service Customer” means a PG&E customer taking CCA Service from RCEA.

11. “CCA Service Request” or (“CCASR”) means a request in a form approved by PG&E to change a CCA customer’s or utility customer’s choice of services, which could include returning a CCA customer to bundled utility service or direct access service.

12. “Customer Information System” or (“CIS”) refers to the systems used by Calpine to store RCEA customer-specific information, including account enrollment status, rate tariff, payment history, collection status, correspondence and other information that is necessary for Calpine to effectively administer Data Manager Services.

13. “Electronic Data Interchange” or (“EDI”) refers to the transfer of data between PG&E and Calpine related to CCA Service Customers of. The EDI transaction sets used for Data Manager Services are as follows:

    a) 248 – Daily Billing Files
    b) 810 – CCA invoice information that appears on customer’s PG&E bill
    c) 814 – CCA enrollments, changes, opt outs and disconnects
    d) 820 – Remittance advice identifying the detail needed to perform cash application to accounts receivable by customer
    e) 824 – Application Advice for Invoices, used to reject invoice transactions
    f) 867 – Electric meter usage data by customer account
    g) 997 - Functional Acknowledgement

14. “Interactive Voice Response” or (“IVR”) refers to the call center voice-recorded system that enables customers, through keypad input, to select options related to their account or access a live call center agent.

15. “Mass Enrollment” refers to the phase-in of a group of new customers (who have not opted out prior to receiving CCASR) onto CCA Service over one billing cycle beginning with each customer’s regularly scheduled meter read date, as further defined in PG&E’s Electric Schedule E-CCA.

16. “Meter Data Management Agent” or (“MDMA”) Services include: reading customers’ meters, validating the meter reads, editing the meter reads if necessary and transferring the meter reading data to a server pursuant to RCEA and PG&E standards.

17. “Net Energy Metering” refers to one of the various Net Energy Metering programs administered by PG&E as described in its Electric Schedules, for which RCEA may provide bill credits for qualifying self-generation to participating CCA Service customers.

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18. “Non-Enrollment Period” refers to any other period that is not a Statutory Enrollment Period.

19. “Qualified Reporting Entity” or (“QRE”) refers to an entity authorized by WREGIS to submit meter data associated with renewable energy on behalf of the generator owner using the WREGIS application.

20. “Rate Schedule” refers to the rate buildout, or formula, that includes all the necessary Billing Determinants, and the values applied to each, used to calculate charges or credits per unit of electricity consumed (kWh) or per unit of demand (kW).

21. “Rate Template” refers to a predefined format used to communicate Rate Schedule(s) from RCEA to Calpine.

22. “Self Service” refers to data that RCEA can obtain and access through the Data Tools, upon its implementation, or to processes or actions which RCEA can perform without the assistance of Calpine staff. Should RCEA request data from Calpine that is available via Self Service or request Calpine perform a process or action that RCEA can perform via Self Service, this shall be considered an Ad Hoc Request and is subject to the fees listed in Exhibit B, Section 4.
23. “Settlement Quality Meter Data” or (“SQMD”) refers to meter data gathered, edited, validated, and stored in a settlement-ready format, for settlement and auditing purposes.

24. “RCEA Service Area” refers to all cities, towns, counties, and unincorporated areas that have selected electric generation service from RCEA.

25. “Statutory Enrollment Period” refers to the three-month period prior to a Mass Enrollment, the month in which the Mass Enrollment occurs, and the two months following Mass Enrollment. The Statutory Enrollment Period takes place over a six-month period.

26. “Structural Rate Change” refers to a rate change that alters one or more Billing Determinants within a Rate Schedule buildout by changing the definition of the Billing Determinant itself and/or adding and/or removing one or more Billing Determinants to an existing buildout.

27. “Value Only Rate Change” refers to a rate change that alters only the values applied to each of the Billing Determinants in a given Rate Schedule buildout, keeping the existing buildout intact.

28. “Western Region Energy Generation Information System” or (“WREGIS”) refers to the independent, renewable energy tracking system for the region covered by the Western Electricity Coordinating Council (WECC).

II. <u>In consideration of the payments set forth in Exhibit B, Contractor shall provide the following services:</u>

1. Electronic Data Exchange Services:

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a) Process CCA Service Requests (CCASRs) from/to PG&E which specify the changes to a customer's choice of services such as enrollment in CCA programs, customer initiated returns to bundled utility service or customer initiated returns to direct access service (814 Electronic Data Interchange Files).

b) Obtain all customer usage data from PG&E's Metered Data Management Agent (MDMA) server to allow for timely billing (according to PG&E requirements) of each customer (867 Electronic Data Interchange Files).

c) Maintain and communicate the amount to be billed by PG&E for services provided by RCEA (810 Electronic Data Interchange Files).

d) Receive and maintain all data related to payment transactions toward CCA charges from PG&E after payment is received by PG&E from customers (820 Electronic Data Interchange Files).

e) Process CCASRs with PG&E when customer status changes.

2. Qualified Reporting Entity (QRE) Services:

a) Consistent with terms and conditions included in the QRE Services Agreement(s) between RCEA and Contractor, serve as QRE for up to thirty (30) locally situated, small-scale renewable generators or other distributed energy resources supplying electric energy to RCEA through a feed-in tariff (FIT) or other mechanism. In the event the number of such resources exceeds that allowed herein, both Parties agree to jointly discuss and determine a mutually agreeable solution to address the excess number of resources.

b) Submit a monthly generation extract file to Western Renewable Energy Generation Information System (WREGIS) on RCEA's behalf, which will conform to the characteristics and data requirements set forth in the WREGIS Interface Control Document for Qualified Reporting Entities.

c) Contractor shall receive applicable electric meter data from PG&E for RCEA distributed energy resource projects, consistent with PG&E's applicable meter servicing agreement, and shall provide such data to RCEA for purposes of performance tracking and invoice creation.

3. Customer Information System:

a) Maintain an accurate database of all eligible accounts who are located in the RCEA Service Area and identify each account's enrollment status (opt

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out, program enrollment), rate tariff election(s), payment history, collection status, on-site generating capacity, if applicable, and any correspondence with customer as well as other information that may become necessary to effectively administer RCEA as mutually agreed to by parties from time to time.

b) Allow RCEA to have functional access to the online database to add customer interactions and other account notes.

c) Allow RCEA to view customer email or written letter correspondence within online database.

d) Maintain historical usage data on all customers for a time period equal to the lesser of either (a) the start of customer service to present or (b) five years. Maintain viewing access, available to appropriate RCEA staff, to view PG&E bills for RCEA customers, including supporting the intuitive parsing and labeling of PG&E provided files. Maintain accessible archive of billing records for all RCEA customers from the start of RCEA Service or a period of no less than five years.

e) Maintain and communicate as needed record of customers who have been offered service with RCEA but have elected to opt out, either before or after starting service with RCEA.

f) Maintain and communicate as needed records of Net Energy Metering credits and generation data for customers to be posted on bill and settled as per RCEA's Net Energy Metering policy.

g) When requested by RCEA, place program charges on the relevant customer account, referenced by its unique identifier.

h) Identify customers participating in various RCEA programs in database.

i) Include various program payment information in all relevant reports.

j) Perform quarterly RCEA program reviews to assess appropriate customer charge level.

k) Maintain all customer data according to RCEA's customer privacy policy and the requirements of relevant California Public Utilities Commission Decisions including D.12-08-045, including a daily backup process.

l) Maintain a Data Management Provider Security Breach Policy.

4. Customer Call Center:

a) Provide professional Interactive Voice Response (IVR) recordings for CCA customer call center.

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i. In the event third party services are required to translate prompts or scripts into languages specified by RCEA, any charges incurred by Contractor as a result of these will be passed by Contractor onto RCEA in accordance with Exhibit B, Section 4.

b) Provide option for IVR self-service, process self-service transactions, and track how many customers start and complete self-service options without live-agent assistance.

c) Provide 24 hours a day, 7 days a week, IVR opt-out availability.

d) Contractor will adhere to the following performance standards during Non-Enrollment Periods:

i. 100% of emails receive an immediate automated acknowledgement and provide report upon request to RCEA that substantiates this requirement has been met.

e) Contractor will adhere to the following performance standards during Statutory Enrollment Periods:

i. 100% of emails receive an immediate automated acknowledgement and provide report upon request to RCEA that substantiates this requirement has been met.

f) Respond to customer program changes with confirmation emails.

g) Provide the call center number on PG&E invoice allowing RCEA customers to contact the call center.

h) Create and maintain online forms for the RCEA website so that customers may perform program related tasks including, but not limited to, opt-up, opt-down, or opt-out from the RCEA website. These program changes will be integrated into the Customer Relationship Management system on a daily or more frequent basis.

i) Monthly Operational Call: Calpine will participate in a monthly call to discuss operational issues requested by RCEA, including: contact center operations, opportunities to improve and progress on projects. Parties will communicate items at least one (1) Business Day in advance.

5. Billing Administration:

a) Apply PG&E account usage for all RCEA customers against applicable Rate Schedules to allow for customer billing.

b) Review application of RCEA Rate Schedules to PG&E accounts to ensure that the proper rates are applied to the accounts.

c) Timely submit billing information for each customer to PG&E to meet PG&E's Billing Window.

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d) Use commercially reasonable efforts to remedy Billing Errors for any customer in a timely manner, no more than two billing cycles.

e) Assist with annual settlement process for Net Energy Metering customers by identifying eligible customers, providing accrued charges and credits, and providing mailing list to CCA designated printer.

f) Provide customer mailing list to RCEA designated printer for new move-in customer notices and opt out confirmation letters routinely within 7 days of enrollment or opt out.

g) Provide customer mailing list to RCEA designated printer for customers with overdue payments and return customers to PG&E bundled service in accordance with RCEA's late payment and collections policies.

h) RCEA will provide Contractor at least one week advance notice for any mass communication by RCEA disseminated to more than 50% of RCEA's customers. If at least one week advance notice is given, the service level applicable to periods other than Statutory Enrollment Periods shall apply for one week from the date of such mass communication in support of RCEA. If less than one week advance notice is given, the service level applicable to Statutory Enrollment Periods shall apply for one week from the date of such mass communication in support of RCEA. Notwithstanding the forgoing, the service level applicable to Statutory Enrollment Periods shall apply for mass communications disseminated during Statutory Enrollment Periods regardless of notice.

i) Send certain RCEA program charges for non-RCEA customers, when supported by PG&E, based on information provided to Contractor by RCEA.

j) Send certain RCEA program charges as a separate line item to PG&E for placement on monthly bill during term of repayment.

k) Contractor will adhere to the following performance standards for this service:

   i. 99% of RCEA charges sent to PG&E free of Contractor error and within PG&E Billing Window, on a rolling 12 month basis (current month and preceding 11 months).

6. Rate Schedule Maintenance

a) Maintain a table of Rate Schedules, offered by RCEA to its customers, within Contractor's billing system.

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i. Complete Value Only Rate Changes within 10 Business Days once Contractor has confirmed it is in receipt of a valid Rate Template.

ii. Complete Structural Rate Changes within 40 Business Days once Contractor has confirmed it is in receipt of a valid Rate Template.

iii. A Rate Template will be considered valid if it meets the expected formatting requirements as set forth by Contractor and acknowledged by RCEA, and the Rate Schedules it contains align with published RCEA tariffs. Upon receipt of a Rate Template, Contractor will review it per these guidelines and after RCEA has corrected any errors, if present, Contractor will communicate to RCEA that a valid Rate Template has been received and work will commence as per the timelines indicated above.

iv. Should RCEA submit updates after Contractor has begun work on a valid Rate Template, RCEA understands this may be considered a new Rate Change.

b) Calpine will provide three (3) Value Only Rate Changes within Contractor's billing system at no additional cost to RCEA, per calendar year of this Exhibit A.

c) Calpine will provide Structural Rate Changes affecting up to 605 Billing Determinants per calendar year of this Exhibit A. The Parties agree to review the current number of Billing Determinant Structural Changes from time to time.

d) Additional Value Only or Structural Rate Changes requested by RCEA will be done at a mutually agreed upon fixed fee per the Rate Change Pricing table included in Exhibit B, Section 1, or at the hourly rate listed in Exhibit B, Section 4, whichever is determined by the parties to be appropriate.

7. Reporting:

a) Standard Reporting

Report	Frequency	Delivery Method
Aging	Weekly, Monthly	SFTP
CAISO MDEF Details (Initial & Final)	Weekly	SFTP
Cash Receipts	Weekly, Monthly	SFTP
Call Center Stats (IVR & iFrame)	Monthly	SFTP
Days To Invoice	Weekly, Monthly	SFTP

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Invoice Summary Reports	Weekly, Monthly	SFTP
Monthly Transaction Summary	Monthly	SFTP
Sent to Collections	Monthly	SFTP
Snapshot	Weekly, Monthly	SFTP
Snapshot with Addresses	Weekly, Monthly	SFTP
Unbilled Usage	Weekly, Monthly	SFTP
Usage Overdue	Weekly, Monthly	SFTP
Sheltering Shift	Daily	SFTP
Customer Opt Stats/Opt-Out w/Rate Class	Weekly	SFTP
NEM Term Cash-Out	Monthly	SFTP
Late Payment Notice	Monthly	SFTP
Non-Defaulted Accounts	Bi-Monthly	SFTP

b) In addition to the reports listed in Section 7.a., RCEA may request additional Ad Hoc reports beyond what is provided per standard reporting which are subject to Ad Hoc fees. Parties will coordinate to ensure the business requirements for development of such reports are reasonably finalized to minimize revisions.

8. Settlement Quality Meter Data:

a) Contractor shall provide RCEA or RCEA's designated Scheduling Coordinator (SC) with Settlement Quality Meter Data (SQMD) as required from SC's by the California Independent System Operator (CAISO).

b) Upon RCEA's request, Contractor shall submit the SQMD directly to the CAISO on behalf of RCEA or RCEA's designated SC.

c) At RCEA's request, Contractor will use, when available, AMI usage data as provided by PG&E through its Share My Data platform in its SQMD aggregation methodology.

9. Data Tools

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a) Establish a data warehouse environment comprised of data related to the services provided by Contractor under this Agreement.

b) Provide access for RCEA staff to query the data warehouse environment.

c) Data made available in the data warehouse may include:

   i. AMI usage data provided by PG&E through their Share My Data (SMD) platform

      a. Prior to loading this data into the data warehouse, Contractor will make commercially reasonable efforts to process the raw SMD data and associate usage data with customer accounts in Contractor's CIS

      b. Contractor will query PG&E systems for updated usage data and make reasonable efforts to update the data warehouse on a daily basis.

   ii. Customer account information and characteristics from the customer list provided by PG&E and supplemented by the following data from CRM and CIS:

      a. RCEA customer participation history

      b. Product elections

      c. Opt-out activity

      d. RCEA rate schedule

      e. Contractor will make reasonable efforts to provide additional characteristics requested by RCEA

   iii. Billing data from Contractor's CIS

   iv. SQMD submission data.

d) Contractor may, from time to time and at its sole discretion, update the functionality available in the data warehouse which may include, among others, adding or maintaining data visualizations, self-service reporting tools, self-service analytical tools, and Application Program Interface (API) points.

e) Contractor may, at its sole discretion, engage with RCEA and other of Contractor's clients to elicit their input on required functionality, data elements, and system design as it pertains to the development, maintenance, and evolution of its data environment.

f) In the absence of the data warehouse or adequate data within the data warehouse for RCEA to Self Service, Contractor shall assist RCEA in

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completing Ad-Hoc requests that RCEA would otherwise Self-Service, including, but not limited to, compiling customer and usage reports. Each such request should be accompanied by mutually agreed upon requirements and proper notice.

g) Contractor will provide technical support to access the data warehouse and documentation describing the data. RCEA will provide staff with technical database expertise to engage with Contractor in the implementation and use of the data warehouse.

h) Data warehouse environment availability expected by end of Q1 2022.

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Exhibit B:

Fees

In consideration of the services provided by Contractor described in Exhibit A and subject to the terms of the Agreement, RCEA shall pay Contractor based on the following fee schedule and terms:

Contractor's cost for the services listed in Exhibit A is $0.96 per active meter per active account per month ("Cost for the Services"). At any point during the Term of this Agreement, should RCEA exceed 170,000 active accounts, Cost for the Services will adjust to a fixed fee of $25,000 plus $0.84 per active meter per active account per month. Travel and all start-up costs are included in this price.

Contractor's payment in effect for the services listed in Exhibit A shall escalate annually beginning on April 2023 by the Consumer Price Index West Region using most current data available.

1. Rate Change Pricing

Additional Rate Changes beyond those included in the per meter per active account pricing noted above will be provided to RCEA per the following price schedule:

Billing Determinants	Up to 50	51 to 250	251 to 500	501 to 1,000	1,001 to 1,500	1,501 to 3,000	3,001 to 4,500	4,501+	Hourly
Value Only Change	$1,000	$2,000	$3,000	$5,000	$7,500	$10,000	$ 13,000	$15,000	
Structural Rate Change	$1,000	$2,500	$5,000	$7,500	$10,000	$15,000	$ 20,000	$30,000	
Custom Rates (2 hours included of preliminary consultation)									$150 / hr

2. Script Translation Services

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Charges incurred by Contractor from engaging with vendors to translate scripts or other documents from English into other language(s) will be passed by Contractor to RCEA at cost.

3. Business Continuity & Back-Up Coverage Plan

In the event that RCEA would like Contractor to perform Contact Center Service for any duration of time in which RCEA is unavailable to perform Contact Center Service, Contractor shall do so in accordance with the rates listed in the table below. With the exception of unforeseen events or unplanned outages, RCEA shall provide Contractor with at least two (2) Business Days advance notice. If less than two (2) Business Days' notice is provided, Calpine cannot guarantee the ability to perform Contact Center Services.

Per Occurrence Costs			
InContact	InContact License/Maintenance Fees	Per Event, Per Month	$100
IT Professional Services	Daily Line Checks, Updates, Testing	Per Event, Per Month	$150
Staffing	Back-Up Coverage, Overflow Messages	Per Minute	$1.50

4. Additional Deliverable Pricing

The Fees defined in Exhibit B include only those service and items expressly set forth in Exhibit A of this Agreement. Unless otherwise agreed to by RCEA and the Contractor, the cost of additional deliverables provided by Contractor to RCEA, including Ad Hoc requests, shall be passed through directly to RCEA without mark-up using a labor rate of $150.00 per hour, ("Labor Rate").

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QUALIFIED REPORTING ENTITY SERVICES AGREEMENT

This Qualified Reporting Entity Services Agreement (this “Agreement') is entered into by and between Calpine Energy Solutions, LLC (''Solutions”) and Redwood Coast Energy Authority (“RCEA”). Solutions and RCEA may be referred to individually herein as “Party'' and collectively as “Parties”. This Agreement is effective as of April 1, 2021, with reference to the following:

WHEREAS, Solutions and RCEA are Parties to that certain Professional Services Agreement Dated April 1, 2021 (the “Master Agreement”); and

WHEREAS, pursuant to the Master Agreement, Solutions agreed to provide qualified reporting entity (“QRE”) services for up to thirty (30) locally situated small-scale renewable generators that are metered by and interconnected to PG&E and either owned/controlled by RCEA or supplied electric energy by RCEA through its feed-in tariff under a separate mutually agreed to QRE services agreement; and

WHEREAS, RCEA represents to Solutions that it owns or otherwise has the rights to all or part of the non-energy attributes of the generation from that certain electric generation facility, or those certain electric generation facilities, more particularly described on Exhibit A hereto (each, a “Generating Unit” and collectively, the ''Facility”), or other rights respecting the Facility itself enabling it to lawfully enter hereinto; and

WHEREAS, the Western Renewable Energy Generation Information System (“WREGIS”) is a system tracking quantities of renewable energy generation generated by electric generating facilities in the nature of the Facility, as a Facility pursuant to WREGIS Terms of Use (“TOU”); and

WHEREAS, WREGIS requires that each Facility have a designated Qualified Reporting Entity (“QRE”); and

WHEREAS, RCEA is an Account Holder in WREGIS and wishes to register the Facility with WREGIS; and

WHEREAS, RCEA wishes to retain Solutions to act as its WREGIS-defined QRE for the Facility.

NOW THEREFORE, in consideration of the mutual promises herein contained, the Parties agree as follows:

1. Definitions; Rules of Construction.

1.1. Initially capitalized terms used and not otherwise defined herein are defined in the Operating Rules or in Attachment 1 of the WREGIS TOU:

1.2. “Affiliate” means, with respect to any entity, each entity that directly or indirectly controls, is controlled by, or is under common control with, such designated entity,

with “control” meaning the possession, directly or indirectly, of the power to direct management and policies, whether through the ownership of voting securities or by contract or otherwise.

1.3. “Business Day” means a day of the week other than Saturday, Sunday, or a federal holiday.

1.4. “Electric System Authority” means each of NERC, WECC, WREGIS, an RTO, a regional or sub-regional reliability council or authority, and any other similar council, corporation, organization or body of recognized standing with respect to the operations of the electric system in the WECC region.

1.5. “FERC” means the Federal Energy Regulatory Commission.

1.6. “Facility” is defined in the Preamble and by reference to Exhibit A.

1.7. “Facility Owner” is defined in Exhibit A hereto.

1.8. “Monthly Generation Extract File” means a data file that contains generation Data from RCEA's Points of Metering and conforms to the characteristics and requirements set forth in the WREGIS Interface Control Document for Qualified Reporting Entities.

1.9. “NERC” means the North American Electric Reliability Corporation.

1.10. “Points of Metering” means the points at which electric generation is measured.

1.11. “QRE” means a WREGIS-defined Qualified Reporting Entity.

1.12. “Renewable” is defined in section 2 of the WREGIS Operating Rules.

1.13. ''Requirements of Law” or “Law” means any applicable federal, state and local law, statute, regulation, rule, code or ordinance enacted, adopted, issued or promulgated by any federal, state, local or other governmental authority or regulatory body (including those pertaining to electrical, building, zoning, environmental and occupational safety and health requirements).

1.14. “Settlement Estimation Procedures” means a calculation based on standard utility estimation rules using algorithms developed and approved by Solutions.

1.15. “Wholesale Generation Also Serving On-Site Loads” is defined in Section 2 of the WREGIS Operating Rules.

1.16. “WECC” means the Western Electricity Coordinating Council.

1.17. “WREGIS” means the Western Renewable Energy Generation Information System.

1.18. “WREGIS Certificate” or “Certificate” means “Certificate” as defined by the WREGIS Operating Rules.

1.19. "WREGIS Operating Rules" means the operating rules and requirements adopted by WREGIS, including the TOU.

1.20. General Rules of Interpretation. Unless otherwise required by the context in which any term appears, (a) the singular includes the plural and vice versa; (b) references to "Articles", "Sections", "Schedules", "Annexes", "Appendices", or ''Exhibits" are to articles, sections, schedules, annexes, appendices or exhibits hereof; (c) all references to a particular entity or an electricity market price index include a reference to such entity's or index's successors; (d) "herein", "hereof", and "hereunder" refer to this Agreement as a whole; (e) all accounting terms not specifically defined herein shall be construed in accordance with generally accepted accounting principles consistently applied; (f) the masculine includes the feminine and neuter and vice versa; (g) "including" means "including, without limitation" or "including, but not limited to"; (h) all references to a particular law or statute mean that law or statute as amended from time to time; and (i) the word "or" is not necessarily exclusive.

1.21. Compliance with Requirements of Law. RCEA agrees to conduct itself in accordance with all Requirements of Law and all requirements of all applicable Electric System Authorities.

2. Term and Termination.

2.1. This Agreement shall be effective upon execution by the Parties and shall continue in effect for the same period as the Effective Period set forth in the Master Agreement (the "QRE Services Effective Period"). Notwithstanding the foregoing, (a) RCEA may terminate this Agreement upon an Event of Default by Solutions if Solutions does not cure such event of default within the applicable cure period set forth in Article 8, (b) Solutions may terminate this Agreement upon an Event of Default by RCEA if RCEA does not cure such event of default within the applicable cure period in Section 8, (c) Solutions may terminate this Agreement if all of the Generating Units fail to meet the requirements of Section 3.2 hereof, (d) either Party may terminate this Agreement immediately upon Notice to the other if RCEA or the Facility fail to comply with Section 1.21 hereof, and (e) this Agreement shall automatically terminate in the event that none of the Generating Units listed on Exhibit A are registered in WREGIS with RCEA, provided RCEA delivers Solutions advance written Notice of RCEA's intent to deregister all Generating Units listed on Exhibit A. This Agreement may also be terminated as otherwise set forth herein.

3. QRE Services.

3.1. **Identification of Facility.** The Facility subject to this QRE Services Agreement at the time of execution of this Agreement is described in Exhibit A, attached hereto and incorporated herein. RCEA and Solutions may update Exhibit A at any time to include additional Generating Units within the scope of this Agreement, up to a maximum

of 10, in accordance with Section 3.4, below. Any such updated Exhibit A shall supersede the prior Exhibit A.

3.2. **Conditions to QRE Services.** Solutions will, on the terms set forth herein, serve as a QRE for the Facility so long as each Generating Unit meets the definition of Renewable, is equipped with meters that meet all applicable WREGIS requirements and is conducted in accordance with all Requirements of Law and all requirements of all applicable Electric System Authorities. For the avoidance of doubt, Solutions will have no obligations with respect to any Generating Unit(s) that, at any time, fail to meet the requirements of the immediately preceding sentence.

3.3. **Compensation to Solutions.** Payment for the services performed by Solutions hereunder is included in the fees paid by RCEA to Solutions under the Master Agreement. In the event WREGIS, WECC, or any other entity with the ability or jurisdiction to modify the QRE reporting process requires a change that materially increases the costs to Solutions of providing QRE services, Solutions may pass those costs to the RCEA by increasing the monthly reporting fee. Solutions will use best efforts to provide RCEA with prior Notice before billing RCEA for such increased costs. The fees set forth herein relate to Solutions serving as a QRE for RCEA pursuant to the terms of this Agreement. The necessary metering is a prerequisite for this service and is Not covered in the fees described above. In the event of materially increased costs, RCEA may elect to terminate this QRE Services Agreement upon thirty (30) Business Days' written Notice to Solutions.

3.4. **Points of Metering.** The Points of Metering that Solutions will use are set forth in Exhibit A. RCEA certifies that all Points of Metering listed in Exhibit A measure data only from Facility(ies) that meets the definition of Renewable. RCEA may, on its own initiative throughout the Term of the Agreement, designate and re-designate, as applicable, the Points of Metering listed in Exhibit A, subject to the following: If RCEA determines that a facility(ies) other than those in Exhibit A, should be added or removed from Exhibit A, then RCEA shall provide Notice consistent with Section 10.3, below, to Solutions identifying any proposed changes to Exhibit A such that is received by Solutions at least thirty (30) Business Days prior to the date upon which Solutions should expect to provide QRE services. Following Solutions' receipt of such Notice, the Parties will decide whether such changes are mutually acceptable. If such changes are not mutually acceptable, either Party may terminate this Agreement.

3.5. **Expenses.** Solutions shall not be responsible for any costs and expenses relating to metering or other equipment installed to accommodate the Facility.

3.6. **Reporting.** RCEA hereby grants to Solutions sole and exclusive permission and authority to report Data, as defined in WREGIS's Interface Control Document for Qualified Reporting Entities and Attachment 1 of the WREGIS TOU, in a Monthly Generation Extract File to WREGIS and warrants and represents that neither RCEA nor any other person or entity acting on behalf of RCEA (and to the best of its knowledge, nor Facility Owner) has granted, or will hereafter grant during the term

hereof any similar data reporting authority or permission to any other QRE or WREGIS Account Holder or to any other party or Agent for use in WREGIS, or any other energy tracking system, for the Facility.

3.6.1. **Monthly Generation Extract File.** Once a month Solutions shall submit a Monthly Generation Extract File to WREGIS on RCEA's behalf, which will conform to the characteristics and data requirements set forth in the WREGIS Interface Control Document for Qualified Reporting Entities.

3.6.2. **Reporting Cycle.** Solutions shall submit the Monthly Generation Extract File to WREGIS no sooner than the last Business Day of each month for Data collected from the Points of Metering during the previous month, or previous portion of the month. Solutions shall submit such data no later than the end of the calendar month following the end date of the Data being reported.

3.6.3. **Adjustments.** After Solutions submits the Monthly Generation Extract File to WREGIS, any information contained in the Monthly Generation Extract File shall be final for purposes of WREGIS reporting, subject only to the adjustment procedures set forth in the WREGIS Operating Rules, which shall be RCEA's responsibility to inform Solutions if any adjustments are necessary.

3.7. **Obligations of RCEA.** RCEA shall send, or cause PG&E to send, the generation Data of the Facility for WREGIS to Solutions in compliance with any protocols which Solutions may reasonably specify to RCEA in accordance with this Agreement. RCEA has a continuing duty to immediately notify Solutions, if and when any generation Data information has been sent in error or ceases to be truthful, accurate, or complete and to supply the corrected data as soon as practical, but not later than five (5) Business Days from the date RCEA discovers that discrepancy in the Data information.

3.8. **WREGIS Fees.** RCEA is solely responsible for the payment directly to WREGIS of any and all WREGIS fees and costs that are required to register the Facility and RCEA is responsible for the payment directly to WREGIS of all other WREGIS fees incident to the reporting of generation Data to WREGIS. RCEA acknowledges and agrees that Solutions shall have no obligation to advance or make payment of WREGIS fees or costs on RCEA's behalf. Upon request by Solutions, if Solutions has received such a request from WREGIS or any regulator or third party, RCEA shall provide Solutions with evidence of payment of WREGIS fees and costs; failure to provide such information to Solutions, upon request, shall constitute an Event of Default under this Agreement.

3.9. **WREGIS Accounts.** RCEA will be solely responsible to make arrangements and registrations and for entering into any such agreements that are necessary to establish transfer of Certificates directly to proper Accounts or Subaccounts of RCEA. RCEA agrees that such arrangements shall preclude the need for Solutions to

act as custodian of such Certificates or to be responsible in any way to hold such Certificates in any Account or Subaccount of Solutions or bear any responsibility, possession, obligation, or risk of loss with respect to Certificates created, held, or owned, with respect to the Facility. RCEA acknowledges that, pursuant to Section 11 of the WREGIS TOU, any generation Data that Solutions, acting as a QRE, provides to WREGIS shall reside in WREGIS and RCEA will have no control over such data's use other than that provided for under the WREGIS TOU.

3.10. **Obligations of Solutions.** Solutions shall specify for RCEA the protocols, reporting frequency, data file formats, and communication protocols for reporting generation Data, as necessary. Solutions shall timely report to WREGIS RCEA Data information as specified in the most current WREGIS Interface Control Document for Qualified Reporting Entities. Solutions shall not use or disclose RCEA generation Data for any other purpose than reporting the Data to WREGIS, except as may be required by Law, the California Energy Commission, any other state, federal, municipal or other regulator or governmental authority with jurisdiction over Solutions or any of its assets, or a court of competent jurisdiction or as required under the terms of an existing agreement between the Parties. In the event that Solutions receives a request for RCEA generation Data for any purpose other than reporting the Data to WREGIS, Solutions shall promptly notify RCEA and shall provide RCEA with sufficient opportunity to seek a protective order to prevent or limit disclosure of the Data prior to providing the Data. Notwithstanding the foregoing, Solutions shall not be responsible for handling, account administration, transfer, evidence of or any determination of RCEA Certificate ownership or any other obligations for Certificates of RCEA with regard to such Certificates; and RCEA shall bear all responsibility for such handling, account administration, evidence of or any determination of RCEA Certificate ownership and all other obligations pertaining to creation and ownership of such Certificates.

3.11. Measurement.

3.11.1. **Meter Data.** RCEA authorizes Solutions to provide Facility's meter data directly to WREGIS in the form of the Monthly Generation Extract File. Data will be gathered from the Points of Metering listed in Exhibit A and provided to Solutions. For purposes of WREGIS, all such data is considered Data which RCEA has created and submitted to WREGIS.

3.11.2. **Wholesale Generation Also Serving On-Site Loads.** If Facility has any Wholesale Generation Also Serving On-Site Loads (as defined in Article l above), RCEA is hereby advised that such Facility will need to have the on-site load generation metered (and registered) separately from the generation that is supplied to the grid, in accordance with the WREGIS Operating Rules. Otherwise, Solutions will not report any data from such Facility. If such Facility exists, it must be specified in Exhibit A.

3.11.3. **Estimates.** When meter readings are not available due to meter hardware failure or data that is determined to be invalid due to meter malfunction

or calibration or configuration error, to the extent deemed by Solutions to be appropriate and permitted pursuant to WREGIS TOU, Solutions will, if possible, rely on readings from redundant meters. If readings from redundant meters are not possible, Solutions will attempt to estimate and report meter data according to Solutions' Settlement Estimation Procedures.

3.11.4. **Responsibility.** Solutions is not responsible for the data created and submitted by RCEA to Solutions, acting as a QRE, to forward to WREGIS.

3.12. **Regulatory Requirements.** Solutions may release information provided by RCEA hereunder, or gathered by Solutions in connection herewith, to comply with any regulatory requirements applicable to Solutions or if requested by a Solutions regulator or if required by any other federal law or court order or Requirements of Law.

3.13. **Grant by RCEA.** RCEA hereby grants to, permits, and authorizes Solutions to engage in the following:

3.13.1. Solutions is hereby authorized to communicate and transact with WREGIS as RCEA's sole and exclusive reporting source of generation Data for the Facility, and WREGIS is hereby authorized to communicate and transact directly with Solutions regarding any generation Data issues for the Facility relating to Solutions' QRE responsibilities under this Agreement. Solutions is hereby authorized to act on behalf of RCEA with respect to the services to be performed by Solutions pursuant to this Agreement, but only to the extent that Solutions has lawful, contractual access to WREGIS.

3.13.2. Solutions is hereby authorized to provide WREGIS with all generation Data for the Facility that WREGIS requires, including, but not limited to, data required for preparation of required reports and billing.

3.13.3. Solutions is authorized to undertake all actions which are reasonable and necessary to carry out the obligations set forth in the subsections above.

3.13.4. RCEA retains all other rights and responsibilities and all other obligations to WREGIS.

4. Indemnity and Hold Harmless.

4.1. To the extent permitted by Requirements of Law, each Party hereby indemnifies and agrees to hold the other Party ("Indemnified Party"), its officers, employees, agents, or representatives, harmless against and from any and all losses, fines, penalties, claims, demands, liabilities, actions, or suits of any nature whatsoever (including legal costs and attorney's fees, both at trial and on appeal, whether or not suit is brought) (collectively, "Liabilities") to the extent arising out of or

resulting from Indemnified Party's performance hereunder, excepting only to the extent such Liabilities are caused by the gross negligence or willful misconduct of Indemnified Party. With respect to Solutions, this includes liability arising from the data contained in the Monthly Generation Extract File.

4.2. NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT, TO THE FULLEST EXTENT PERMITTED BY LAW, RCEA ASSUMES FULL RESPONSIBILITY AND RISK OF LOSS RESULTING FROM RCEA'S (1) FAILURE TO SEND DATA IN A FORMAT SPECIFIED BY SOLUTIONS, (2) FAILURE TO USE PROTOCOLS SPECIFIED BY Solutions OR (3) SENDING OF ERRONEOUS, UNTRUTHFUL, INACCURATE, AND/OR INCOMPLETE GENERATION DATA TO Solutions OR THE SENDING OF ERRONEOUS, UNTRUTHFUL, INACCURATE, AND/OR INCOMPLETE DATA BY Solutions TO WREGIS. IN NO EVENT SHALL EITHER PARTY BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, EXEMPLARY, OR OTHER INDIRECT LOSS OR DAMAGES RESULTING FROM ANY BREACH OF THIS AGREEMENT, WHETHER CAUSED BY THE NEGLIGENCE OR INTENTIONAL ACTIONS OF SUCH PARTY (AND/OR ITS CONTRACTORS, AGENTS, AND EMPLOYEES), REGARDLESS OF WHETHER SUCH CLAIM FOR DAMAGES IS BASED IN CONTRACT, TORT, STRICT LIABILITY, UNDER ANY INDEMNITY OR OTHERWISE. IN NO EVENT SHALL SOLUTIONS BE LIABLE FOR ANY LOSS OR HARM SUFFERED BY RCEA OR ANY THIRD PARTY DUE TO ANY ACTION OR INACTION BY SOLUTIONS TAKEN HEREUNDER THAT CAUSES A FACILTIY TO LOSE ANY CREDENTIALS, REGISTRATION OR QUALIFICATION UNDER THE RENEWABLE PORTFOLIO STANDARD OR SIMILAR LAW OF ANY STATE OR OTHER JURISDICTION.

4.3. THIS ARTICLE SHALL SURVIVE ANY TERMINATION OF THIS AGREEMENT, WHETHER SUCH TERMINATION IS BY SOLUTIONS OR RCEA, AND WHETHER OR NOT SUCH TERMINATION IS ON ACCOUNT OF AN EVENT OF DEFAULT.

5. Further Obligations and Limitations.

5.1. **No Sale.** Nothing herein constitutes a sale or purchase of energy or renewable energy certificates to or from RCEA to or by Solutions.

5.2. **PTCs.** Solutions shall not bear any risks, financial or otherwise throughout the term, associated with RCEA's or the Facility's eligibility to receive production tax credits (“PTCs'') or qualify for accelerated depreciation for RCEA's or the Facility Owner's accounting, reporting or tax purposes.

5.3. **Further Assurances.** At Solutions' request, the Parties shall execute such documents and instruments as may be reasonably required to effect the essential intent and purposes hereof.

5.4. **Station Service.** Solutions shall not be responsible for arranging and obtaining any station service required by the Facility.

5.5. **Costs of Ownership and Operation.** Without limiting the generality of any other provision hereof, Solutions shall not be responsible for paying or causing to be paid when due (a) any costs of owning and operating the Facility in compliance with existing and future Requirements of Law and the terms and conditions hereof; and (b) any taxes and charges (however characterized) now existing or hereinafter imposed on or with respect to the Facility, its operation, or on or with respect to emissions or other environmental impacts of the Facility, including any such tax or charge (however characterized) to the extent payable by a generator of such energy or renewable energy certificates.

5.6. **Data Request.** In the event that Solutions receives a request for information provided by RCEA hereunder, or gathered by Solutions in connection herewith, other than for reporting the Data to WREGIS, Solutions shall promptly notify RCEA and shall provide RCEA with sufficient opportunity to seek a protective order to prevent or limit disclosure of the Data prior to providing the Data. Upon written request from Solutions, RCEA shall promptly either notify Solutions of its intent to limit or prevent disclosure of the Data, or provide Solutions with Data reasonably required for information requests from any governmental authorities, state or federal agency intervener or any other party achieving intervener status in any rate proceeding or other proceeding before any governmental authority. RCEA shall use best efforts to respond to Solutions sufficiently in advance to enable Solutions to review it and meet any submission deadlines.

5.7. **Additional Information.** RCEA shall provide to Solutions such other information respecting RCEA or the Facility as Solutions may, from time to time, reasonably request which Solutions requires to perform its services under this Agreement.

5.8. **No Dedication.** Nothing herein shall be construed to create any duty to, any standard of care with reference to, or any liability to any person not a Party hereto.

6. Representations and Warranties.

6.1. **Mutual Representations and Warranties.** Each Party represents and warrants to the other that: (i) it is duly organized and validly existing under the laws of the jurisdiction of its incorporation or organization; (ii) it has the corporate, governmental and other legal capacity and authority to enter hereinto and to perform its obligations hereunder; (iii) such execution and performance do not violate or conflict with any law, order or agreement applicable to it; (iv) it has all governmental and other authorizations that are required to have been obtained or submitted by it with respect hereto, and they are in full force and effect; (v) its obligations hereunder are valid, binding and enforceable in accordance with their terms (subject to bankruptcy or similar laws affecting creditors' rights generally); (vi) no Event of Default, or event which with Notice and/or lapse of time would constitute such an Event of Default, has occurred and is continuing or would occur as a result of its entering into or performing its obligations hereunder; (vii) it is not relying upon any representations of the other Party, except those expressly set forth

herein; (viii) it has entered hereinto with a full understanding of the material terms and risks of the same, and it is capable of assuming those risks.

6.2. **Representations and Warranties of RCEA.** RCEA hereby represents and warrants to Solutions: (i) it has made its business decisions based upon its own judgment and any advice from such advisors as it has deemed necessary and not in reliance upon any view expressed by Solutions; (ii) it has not received from Solutions any assurances or promises regarding any financial results or benefits hereunder; (iii) service hereunder is not a utility service within the meaning of Section 366 of the United States Bankruptcy Code; and (iv) RCEA has been authorized by Facility Owner to manage the WREGIS account for the Facility on Facility Owner's behalf.

7. Financial Responsibility.

7.1. **Adequate Assurances.** Without limiting Solutions' rights under Article VIII hereof: if RCEA has failed to make a timely payment hereunder, and Solutions has reasonable grounds for insecurity regarding the performance of any obligation of RCEA hereunder (whether or not then due), Solutions may demand Adequate Assurances of Performance. "Adequate Assurances of Performance" means sufficient security in the form, amount, by an issuer or guarantor, and for the term reasonably acceptable to Solutions, including, but not limited to, cash, a standby irrevocable letter of credit, a prepayment, a security interest in government securities, an asset or a performance bond or guaranty. Such Adequate Assurances of Performance shall be provided within five (5) Business Days after a written demand is made by Solutions.

8. Events of Default Remedies.

8.1. **Event of Default**. "Event of Default" means, with respect to a Party (the "Defaulting Party"):

8.1.1. the failure to render when due any payment or performance hereunder, if such failure is not remedied within five (5) Business Days after written Notice;

8.1.2. the failure to timely provide Adequate Assurances required pursuant to Article 7 hereof;

8.1.3. any such Party's representation or warranty proves to have been incorrect or misleading in any material respect when made;

8.1.4. the failure to perform any other covenant set forth herein if such failure is not remedied within five (5) days after written Notice

8.1.5. its bankruptcy or dissolution;

8.1.6. the expiration or termination of any credit support of RCEA's obligations hereunder (other than in accordance with its terms) prior to the satisfaction of all obligations of RCEA without the written consent of Solutions; or

8.1.7. In the case of RCEA:

8.1.7.1. RCEA fails to report generation Data information to Solutions for the Facility or RCEA fails to send the data in a format and use the protocols specified by Solutions as determined by Solutions to be required to meet the requirements of the WREGIS Operating Rules;

8.1.7.2. RCEA is delinquent in payment to WREGIS of any WREGIS fees for registration or maintenance of Accounts or Subaccounts, which payment impairs the ability of Solutions to report generation Data information to WREGIS regarding the Facility, which delinquency continues for a period of thirty (30) days;

8.1.7.3. RCEA fails to comply with a request by Solutions to provide evidence of payment of WREGIS fees pertaining to the Facility; or

8.1.7.4. RCEA knowingly or intentionally falsifies or misrepresents any Data information, or other information required by WREGIS.

8.1.8 In the Case of Solutions:

8.1.8.1 Solutions is delinquent or fails to timely report generation Data information to WREGIS as required by this Agreement;

8.1.8.2 Solutions fails to comply with a request by RCEA to provide evidence of reporting to WREGIS;

8.1.8.3 Solutions knowingly or intentionally falsifies or misrepresents any Data information, or other information, reported to WREGIS.

8.1.8.3 For those events described in in 8.1.8.1 through 8.1.8.3, inclusive, Solutions shall have twenty (20) Business Days to cure, except for such remedies that require longer than twenty (20) Business Days to cure, in which case Solutions shall have such longer time as is reasonably necessary, provided that Solutions efforts to cure are continuous and diligent.

8.2. **Remedies Upon Event of Default.** In the Event of Default by a Party and for so long

as the Event of Default is continuing, the non-defaulting Party (the "Performing Party") shall have the right to do any or all of the following: (1) upon two (2) Business Days' written Notice to the Defaulting Party, terminate this Agreement; (2) withhold any payments (except payments in respect of obligations performed prior to Event of Default) or performance due in respect of this Agreement; and (3) exercise such other remedies as may be available at law or in equity or as otherwise provided for herein, to the extent such remedies have not been otherwise waived or limited pursuant to the terms hereof.

8.3. **Setoff.** If an Event of Default occurs, the Performing Party may, at its election, set off any or all amounts which the Defaulting Party owes to it or any Affiliate of the Performing Party (whether under this Agreement or otherwise and whether or not then due) against any or all amounts which it or any Affiliate of the Performing Party owes to the Defaulting Party (whether under this Agreement or otherwise and whether or not then due).

8.4. **Payment of Damages.** Any amounts due on account of an Event of Default shall be paid within three (3) Business Days following the Defaulting Party's receipt of the Performing Party's written termination Notice setting forth the termination payment due.

8.5. **Dispute Resolution.** Any dispute arising out of or in connection with this Agreement or its performance, including but not limited to its validity, construction, or enforcement shall, to the extent possible, be settled amicably by negotiation between the Parties represented by management of each Party, prior to either Party taking legal action. Such negotiation shall commence and be concluded within five (5) Business Days of on Party's Notice to the other made in a manner consistent with 10.3, below. Both Parties agree to make good faith efforts to resolve any dispute under the Agreement. Negotiations and meetings conducted pursuant to this paragraph shall be confidential and shall be treated as compromise and settlement discussions not admissible in any legal proceeding involving this Agreement, in accordance with state and federal rules of evidence. Notwithstanding the foregoing, however, either Party may seek provisional legal remedies, if in such Party's judgment such action is necessary to avoid irreparable damage or preserve the *status* quo. Any dispute arising out of or in connection with this Agreement or its performance, including but not limited to its validity, construction, or enforcement shall, to the extent possible, be settled amicably by negotiation between the Parties represented by management of each Party, prior to either Party taking legal action. Such negotiation shall commence and be concluded within five (5) Business Days of on Party's Notice to the other made in a manner consistent with 10.3, below. Both Parties agree to make good faith efforts to resolve any dispute under the Agreement. Negotiations and meetings conducted pursuant to this paragraph shall be confidential and shall be treated as compromise and settlement discussions not admissible in any legal proceeding involving this Agreement, in accordance with state and federal rules of evidence. Notwithstanding the foregoing, however, either Party may seek provisional legal remedies, if in such Party's judgment such action is

necessary to avoid irreparable damage or preserve the *status* quo.

8.6. **Limitation of Liability.** THE EXPRESS REMEDIES AND MEASURES OF DAMAGES PROVIDED HEREIN SATISFY THE ESSENTIAL PURPOSES HEREOF. FOR BREACH OF ANY PROVISION FOR WHICH AN EXPRESS REMEDY OR MEASURE OF DAMAGE IS PROVIDED, SUCH REMEDY OR MEASURE SHALL BE THE SOLE AND EXCLUSIVE REMEDY THEREFOR. LIABILITY THAT HAS NOT BEEN OTHERWISE EXCLUDED PURSUANT TO TIIE TERMS HEREOF SHALL BE LIMITED TO DIRECT ACTUAL DAMAGES ONLY AS THE SOLE AND EXCLUSIVE REMEDY. EXCEPT AS OTHERWISE SPECIFICALLY SET FORTH HEREIN, NO PARTY SHALL BE REQUIRED TO PAY OR BE LIABLE FOR SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, OR INDIRECT DAMAGES, LOST PROFIT OR BUSINESS INTERRUPTION DAMAGES, BY STATUTE, IN TORT, CONTRACT, UNDER ANY INDEMNITY OR OTHERWISE. THIS SECTION 8.6 SHALL APPLY TO THE FULLEST EXTENT PERMITTED BY LAW.

8.7. **No Recourse Against Constituent Members of RCEA.** RCEA is organized as a Joint Powers Authority in accordance with the Joint Exercise of Powers Act of the State of California (Government Code Section 6500, et seq.) pursuant to the Joint Powers Agreement and is a public entity separate from its constituent members. RCEA shall solely be responsible for all debts, obligations and liabilities accruing and arising out of this Agreement. Solutions shall have no rights and shall not make any claims, take any actions or assert any remedies against any of RCEA's constituent members in connection with this Agreement.

8.8. **Survival.** This Article survives the expiration or termination hereof.

9. Force Majeure.

9.1. Except with regard to a Party's obligation to make payments hereunder, in the event either Party hereto is rendered unable, wholly or in part, by Force Majeure to carry out its obligations with respect hereto, then upon such Party's (the “Claiming Party”) giving Notice and full particulars of such Force Majeure as soon as reasonably possible after the occurrence of the cause relied upon, such Notice to be confirmed in writing or by facsimile to the other Party, then the obligations of the Claiming Party shall, to the extent they are affected by such Force Majeure, be suspended during the continuance of said inability, but for no longer period, and the Claiming Party shall not be liable to the other Party for, or on account of; any loss, damage, injury or expense resulting from, or arising out of such event of Force Majeure. The Party receiving such Notice of Force Majeure shall have until the end of the Business Day following such receipt to notify the Claiming Party that it objects to or disputes the existence of an event of Force Majeure. “Force Majeure” means an event or circumstance which prevents one Party from performing its obligations hereunder, which event or circumstance was not anticipated, which is not within the reasonable control of, or the result of the negligence of, the Claiming Party, and which, by the exercise of due diligence, the Claiming Party is unable to overcome or avoid or cause to be avoided.

9.2. **Force Majeure Does Not Affect Other Obligations.** No payment obligations of RCEA that arose before the Force Majeure causing the suspension of performance or that arise after the cessation of the Force Majeure shall be excused by the Force Majeure.

9.3. **Strikes.** Notwithstanding any other provision hereof, neither Party shall be required to settle any strike, walkout, lockout or other labor dispute on terms which, in the sole judgment of the Party involved in the dispute, are contrary to the Party's best interests.

10. Miscellaneous.

10.1. **Choice of Law.** This Agreement shall be interpreted and enforced in accordance with the laws of the state of California.

10.2. **Restriction on Assignments.** Neither Party may assign this Agreement or any of its rights or obligations hereunder without the prior written consent of the other Party, which consent shall not be unreasonably withheld, conditioned or delayed, except it may be assigned or transferred without such approval: (i) by Solutions to a successor acquiring all or substantially all of the shares and/or the assets, whether by merger or acquisition, (ii) by Solutions to any Affiliate; or (iii) by Solutions in connection with any financing or other financial arrangements involving the accounts, revenues or proceeds hereof. Any purported assignment in violation hereof shall be void. This Agreement inures to the benefit of and is binding upon the Parties and their respective successors and permitted assigns.

10.3. **Notices.** All Notices, requests, statements or payments shall be made to the addresses set out on the Notices Exhibit B. Notices required to be in writing shall be delivered by letter, facsimile or other documentary form. Notice by facsimile or hand delivery shall be deemed to have been given when received or hand delivered. Notice by overnight mail or courier shall be deemed to have been given on the date and time evidenced by the delivery receipt The Parties may change any of the persons to whom Notices are addressed, or their addresses, by providing written Notice in accordance with this Section. "Notice" shall mean a writing delivered by one Party to the other, in the form of a letter, facsimile or other documentary form that affects the rights, obligations or duties of a Party hereto.

10.4. **Entire Agreement; Counterparts.** This Agreement constitutes the entire agreement between the Parties with respect to its subject matter. This Agreement may not be amended, changed, modified, or altered unless such amendment, change, modification, or alteration is in writing and signed by both Parties. This Agreement may be executed in counterparts, including by telefacsimile transmission, each of which is an original and all of which taken together constitute one and the same original instrument. This Agreement completely and fully supersedes all other prior understandings or agreements, both written and oral, between the Parties relating to the subject matter hereof. If any provision of this Agreement is determined to be

invalid, void or unenforceable by any court of competent jurisdiction, such determination shall not invalidate, void, or make unenforceable any other provision, agreement or covenant of this Agreement, provided the basic purposes of this Agreement and the benefits to the Parties are not substantially impaired.

10.5. **No Waiver.** Waiver by a Party of any default by the other Party shall not be construed as a waiver of any other default, nor shall any delay by a Party in the exercise of any right under this Agreement be considered as a waiver or relinquishment thereof.

10.6. **Attorneys' Fees.** In the event such judicial proceedings are instituted by either Party, the prevailing Party shall be entitled to award of its costs and attorneys' fees incurred in connection with such proceedings.

10.7. **Jury Trial Waiver.** THE PARTIES EACH HEREBY IRREVOCABLY WAIVE ALL RIGHT TO TRIAL BY JURY IN ANY ACTION, PROCEEDING OR COUNTERCLAIM ARISING OUT OF OR RELATING HERETO, ANY TRANSACTIONS CONTEMPLATED HEREBY. EACH PARTY FURTHER WAIVES ANY RIGHT TO CONSOLIDATE ANY ACTION IN WHICH A JURY TRIAL HAS BEEN WAIVED WITH ANY OTHER ACTION IN WHICH A JURY TRIAL CANNOT BE OR HAS NOT BEEN WAIVED.

10.8. **No Third-Party Beneficiaries.** This Agreement confers no rights whatsoever upon any person other than the Parties and shall not create, or be interpreted as creating, any standard of care, duty or liability to any person not a Party hereto.

10.9. **Relationship of the Parties.** Nothing contained herein shall be construed to create an association, joint venture, trust, or partnership, or impose a trust or partnership covenant, obligation, or liability on or with regard to any one or more of the Parties. Each Party shall be individually responsible for its own covenants, obligations, and liabilities under this Agreement.

IN WITNESS WHEREOF, the Parties have executed this Agreement by their duly authorized representatives as of the date first above written.

CALPINE ENERGY SOLUTIONS, LLC	**REDWOOD COAST ENERGY AUTHORITY**
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____

Exhibit A:
Facility List

For each facility, the following information is required:

[NAME OF GENERATION FACILITY]

Facility Owner:

[FACILITY OWNER NAME]
[FACILITY OWNER ADDRESS]

Method for Points of Metering Data reporting to Solutions:

[DELIVERY METHOD AND METER DETAILS – EXAMPLE FOLLOWS]

Meter Data will be read by PG&E and sent to Solutions via EDI file.
Account #:
PG&E Meter #:

Exhibit B:
Notices

To RCEA:

[PLEASE SPECIFY NOTICE RECIPIENT(S) HERE]

To Solutions:

Calpine Energy Solutions LLC
401 West A Street, Suite 500
San Diego, CA 92101-3017
Attn: Legal Dept
Telephone: [redacted]
Fax:

With copy to (regarding Exhibit A):

Calpine Energy Solutions LLC
401 West A Street, Suite 500
San Diego, CA 92101-3017
Attn: CCA Operations Manager - Data Team
Telephone: [redacted]
Fax:

DRAFT

REDWOOD COAST EnergyAuthority

STAFF REPORT
Agenda Item # 8.1

AGENDA DATE:	March 25, 2021
TO:	Board of Directors
PREPARED BY:	Richard Engel, Director of Power Resources Michael Furniss, Consultant to RCEA Kit Mann, Community Advisory Committee Member
SUBJECT:	Biomass Analysis

SUMMARY

This biomass discussion is intended to familiarize new Board members with local biomass energy and some of the issues related to its inclusion in RCEA's power portfolio, and to update all Board members on recent analysis and discussion by the Community Advisory Committee and RCEA's consultant Michael Furniss. This agenda item may be of help to the Board as they consider a proposed amendment to RCEA's power purchase agreement with Humboldt Sawmill Company that would extend the term of the agreement. This amendment will be brought to the Board for consideration at an upcoming meeting.

There have been recent changes in the local biomass power economy, including the indefinite closure of the DG Fairhaven plant, and interest expressed by the owners of the Blue Lake biomass plant in restarting their plant to sell power to RCEA. In light of these developments, and the opportunity to amend our agreement with Humboldt Sawmill Company, RCEA consultant Michael J. Furniss has updated his *Biomass Power in Humboldt County* report, originally developed in conjunction with the 2019 update of RCEA's RePower Humboldt strategic plan and presented to the Board in January 2020. Mr. Furniss will present this updated report to the Board.

At its October 2020 meeting, the RCEA Community Advisory Committee (CAC) formed an ad hoc subcommittee to consider alternative uses of local biomass material, including both local mill wastes and in-woods slash and thinning material. This subcommittee's work is in keeping with RCEA's RePower Humboldt strategic plan's strategy 4.1.11.6:

> *Plan for a Long-Term Transition Away from Direct Combustion of Forest-Derived Biomass and Toward Lower-Impact Uses of this Material. Investigate and pursue development funding for alternative pathways that could address local forest products industry biowaste management needs, including:*
>
> - *Repowering of the existing biomass plants to substantially reduce emissions and/or improve efficiency*
> - *Emerging biomass energy technologies, including but not limited to gasification, torrefaction, and briquetting*
> - *Non-energy products, including but not limited to biochar and durable goods*

Community Advisory Committee member Kit Mann will present a preliminary report from the subcommittee and ask the Board to respond to a series of questions included in the report.

RECOMMENDED ACTION

Accept *Biomass Power in Humboldt County* report and presentation from consultant Michael J. Furniss.

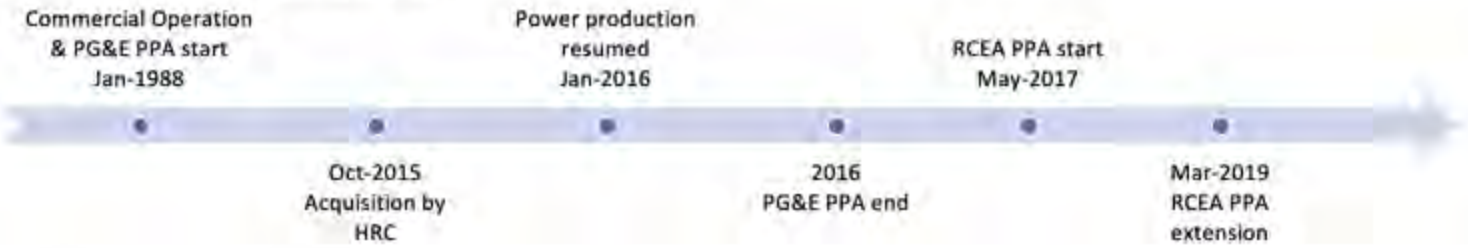
Accept *Alternative Uses of Biomass Material in Humboldt County* Preliminary Report from the Community Advisory Committee.

ATTACHMENTS

- *Biomass Power in Humboldt County* updated consultant report and slide presentation
- *Alternative Uses of Biomass Material in Humboldt County* - Preliminary Report to the RCEA Board of Directors from the Community Advisory Committee

Humboldt County Biomass Plant Timelines

Humboldt Redwood Company Cogen Plant:



DG Fairhaven Biomass Plant:

Blue Lake Power Biomass Plant:

3/22/2021. -J.Gwynn

Biomass Power in Humboldt County

Summary of Workshops, Consultations, and Research

Prepared by

Michael J. Furniss

Climate and Forests Consultant

to Redwood Coast Energy Authority

January 2020

Updated: March 2021

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Summary

1. Biomass helps to move away from fossil fuels for generating electric power.

2. Biomass can balance the intermittent power supplies from solar and wind generation. When more flexible grid solutions and storage facilities are added, this will become less important.

3. Biomass is widely considered a 'bridge' solution to climate change.

4. Biomass provides local electric power that is otherwise provided by the PG&E natural gas plant in King Salmon.

5. As forests, wood products and mill residues are part of the natural carbon cycle, biomass power is often said to be ‘carbon neutral’. However, as greenhouse gases (GHG) are emitted, carbon neutrality is difficult to unambiguously establish.

6. Biomass is currently the only renewable local source of utility-scale electric generation in Humboldt County.

7. Biomass power emits air pollutants that are dangerous to human health when humans are exposed. Open burning emits more air pollutants and greenhouse gasses (GHGs), but human exposure to air pollutants in the wildlands is usually comparatively small.

8. Burning biomass in a facility designed for power production entails efficient combustion and pollutant filtration systems. Forestry and mill residues have always traditionally been disposed of by burning. Most alternatives for mill residue (or biomass) disposal produce higher levels of GHG warming emissions and air pollutants than burning in a power-generating biomass plant.

9. By converting mill residues into long-lived products, significant amounts of carbon could be sequestered, reducing local greenhouse gas emissions.

Biomass Power in RCEA's Current Strategy

From: Repower Humboldt 2019 Update[1]

"4.1.11. Power Resources: Bioenergy

4.1.11.1 Support Biomass Fuels Reduction and Utilization. Develop strategies and technologies for improved biomass utilization in ways that effectively support restoration objectives and fire management priorities. Coordinate with local agencies, communities, and landowners to develop biomass energy plans that are consistent with sustainable forest management, hazardous fuels reduction, fire safety, and restoration needs.

4.1.11.2 Procure Local Biomass Energy. Contract with local biomass facilities as a means of providing locally generated renewable power and managing wood waste from mills and, when feasible and appropriate, from forest management and restoration activities. Require and support a high standard of environmental performance from RCEA's biomass suppliers. Support the deployment of the best-available emissions control technologies, recognizing that power producers' ability to implement such technologies is affected by the price they are paid for their power and term length of contracts.

4.1.11.3 Investigate the Impacts of Biomass Emissions. Support research and quantification of the gross and net emissions of greenhouse gases and criteria pollutants associated with local biomass energy production, and the potential emissions reductions associated with disposing of biomass feedstocks by other means. Support development of a locally specific model to estimate human exposure to criteria pollutants from biomass power plants under different operating scenarios. Adjust RCEA's biomass power procurement strategy as appropriate based on these findings and power producers' progress in limiting emissions and in keeping with achieving RCEA's power mix goals for 2025 and 2030. Consider power producers' historic emissions performance in making procurement decisions.

4.1.11.4 Establish a Biomass Technical Advisory Committee. Create a technical advisory committee made up of local government representatives; state and federal natural resource agencies; and subject matter experts on biomass energy, public health, the local forest products industry, and environmental impacts associated with biomass energy. The committee shall meet periodically and provide a quarterly report to the RCEA Board of Directors on technical feasibility and financial, environmental, and health implications of biomass use alternatives.

4.1.11.5 Promote Small-Scale Biomass Generation Sites. Monitor feasibility of smaller and/or mobile biomass electric generators fed with wood residue and very small diameter logs (e.g., from thinning for fire safety and timber harvest slash). If/when technology proves feasible and cost-effective, promote its use in county areas where appropriate."

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[1] RePower Humboldt The Redwood Coast Energy Authority's Comprehensive Action Plan for Energy 2019 Update.12-12-19. https://redwoodenergy.org/wp-content/uploads/2020/06/RePower-2019-Update-FINAL-.pdf

Global Context for Biomass Power

Since the human discovery of how to start a fire, burning biomass has been the primary human energy source. Even today, more than half of the world's population uses biomass as its primary energy source. We have since transitioned modern society to burning fossil fuels for energy, not realizing that the emissions would disrupt the climate worldwide, with immense and growing adverse consequences.

The United Nations Intergovernmental Panel on Climate Change (UN IPCC) has recently concluded that to avoid severe climate consequences, GHG emissions must be reduced dramatically as soon as possible.

Now we face a critical question: How do we move from powering our world with fossil fuels to using only the sun, the wind, moving water, and the heat of the earth's crust?

We need "bridge solutions" in moving to new and necessary technologies, and biomass is considered a prime candidate worldwide. The potential to generate electricity and heat is obvious, but so are the drawbacks of air pollution, carbon emissions, and the concern for forest and agricultural management and impacts.

Lumber mills produce residue from product manufacturing, including sawdust, bark, cutoffs, wings, and other remnants. Some of this leftover material has economic value and is sold as chips for paper production, mulch, fiberboard manufacture, burnable pellets, and so on. To be utilized in these ways, the residue material must be of high quality. There must also be a current market demand, which can vary significantly over time.

What remains after these higher quality byproducts are sold and transported away is a lower-quality material, woody biomass that has no current economic value. For decades, this material was disposed of by open burning. Among other impacts, black carbon (soot) and methane emissions from open burning are substantial and especially adverse to atmospheric warming and climate change.

However, the same biomass can be burned to make steam that drives turbines generating electric power, with substantially fewer emissions. Biomass energy plants must meet strict regulatory requirements, including high-efficiency burning and particulate filters on smokestacks.

While the use of biomass helps to move us away from fossil fuels and helps provide continuity to the intermittent power from solar and wind generation, it also has drawbacks. As technologies improve with more flexible grid solutions, and as storage facilities are added, the need for biomass generation to bridge these gaps will diminish.

At present, biomass energy fuels about two percent of global electricity production, more than any other renewable source. In some countries—Sweden, Finland, and Latvia among them—bioenergy is 20 to 30 percent of the national generation mix, almost entirely provided by trees. Biomass use for electrical generation is also on the rise in China, India, Japan, South Korea, and Brazil. (Hawken et al. 2017.)

Is Biomass Power a "Carbon Neutral" Climate Solution?

Climate change has primarily resulted from fossil carbon extraction from outside the natural carbon cycle and adding it to the atmosphere and oceans, resulting in significant and consequential radiative forcing and the rapid climate warming that we now observe. There is a global consensus that we must limit the further additions of fossil carbon to the atmosphere and do so as quickly as possible.

Biomass burns carbon-containing materials and thus emits GHGs. This carbon is considered to be "in the cycle" and does not contribute to increasing the total amount of carbon circulating within the earth's biosphere. That is, the carbon in biomass would naturally be emitted as the plants die and decay, and after being emitted, is typically sequestered again through new biomass growth within years to decades. Consideration and accounting for GHG emissions from biomass burning are nuanced.

The energy density of woody material is low relative to coal or natural gas. Thus, the CO_2 emissions per unit of useful energy are higher for woody biomass than from these other energy sources.

The CO_2 emissions per unit of energy generation are:
Natural gas: 118 lb. CO_2/MMBtu
Bituminous coal: 205 lb. CO_2/MMBtu
Wood: 213 lb. CO_2/MMBtu (bone dry)

Approximately 320,000 tons of CO_2 are emitted annually by the two local biomass plants, DG Fairhaven and HRC Scotia.

Burning biomass produces carbon emissions. However, it is not adding fossil carbon that has been stored for eons far below ground, as is the case with fossil fuels. Biomass energy generation burns carbon that is in circulation, cycling from the atmosphere to plants and back again.

Does this carbon addition to the atmosphere count? Yes and no, depending on the timing of emissions and how we view the overall carbon balance and the continued extraction of fossil fuels.

The authors of Repower Humboldt pointed out several key issues that would need to be addressed before any expansion of biomass infrastructure. One of these issues was the assumption that biomass is "carbon neutral":

"In general, biomass has been treated as a carbon-neutral resource as long as the harvest rate does not exceed the rate of new growth. However, this premise is currently being scrutinized and regulatory treatment of biomass could change. (...) These emissions can be assessed in a life-cycle analysis. This study treated biomass as a carbon-neutral resource. It is recommended that this assumption be further evaluated as a topic of future research." (RePower 2013).

Biomass helps to move away from fossil fuels and helps balance the supply of intermittent power from solar and wind generation. When more flexible grid solutions come about and storage facilities are added, this will become less important.

Scientists tend to be split on whether biomass burning can be considered "carbon neutral." The carbon loading of any biomass generation facility depends on its context: fuel source, transportation and handling costs, the degree of substitution for fossil fuels, and other factors that differ from facility to facility.

Many scientists conclude that if trees grow back in a few decades and if harvest volume is equal to or greater than burned volume, the GHG inputs do not "count," as they are re-sequestered, just as the carbon cycle has been operating for millions of years. That is, if burning biomass that is inside the natural carbon cycle substitutes for fossil fuels, many contend that this amount can be "subtracted", creating a neutral or even carbon-negative result.

Others contend that a CO_2 molecule has the same radiative effect regardless of its source: and therefore, biomass burning does count as an adverse emission. In California and international carbon emissions accounting, some emissions from Land Use, Land-Use Change, and Forestry (LULUCF), which are inside the natural carbon cycle, are counted, while some are not, due to difficulties in measurement, such as for soil carbon.

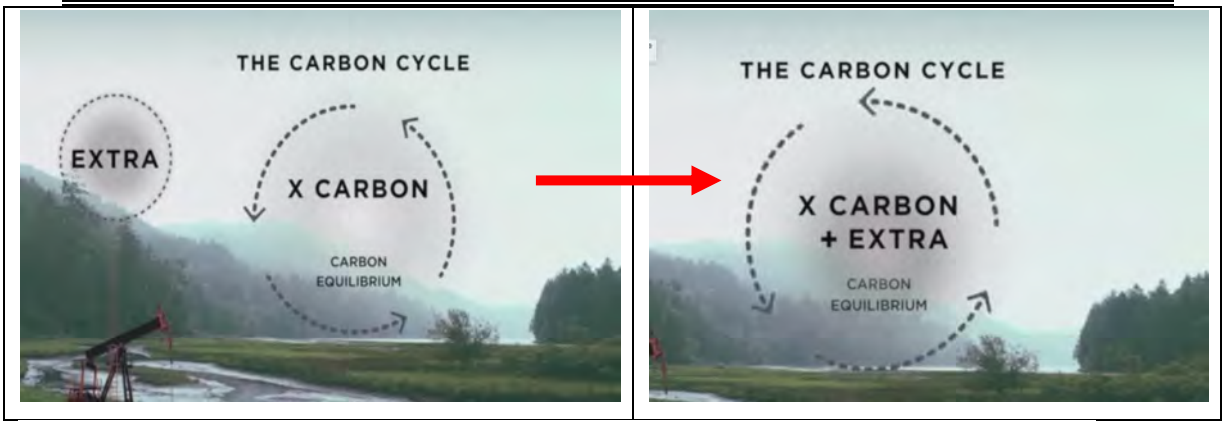


Figure 1: *Billions of tons per year of non-circulating fossil carbon have been added to the carbon cycle. This is the primary driver of human-caused climate change.*

According to Morris, 2008,

"Carbon Neutral and Beyond: The greenhouse-gas emissions produced at biomass and biogas generating facilities come from carbon that is already a part

of the linked atmospheric – biospheric carbon cycle. This is in stark contrast to fossil fuel combustion, which removes carbon from permanent geologic storage, and adds it as net new carbon to the carbon already in the atmospheric – biospheric circulation system. Most people focus on this aspect of bioenergy production and proclaim it to be "carbon Neutral."…. Biomass energy production can change the timing and relative mix (oxidized vs. reduced) of carbon forms emitted into the atmosphere associated with the biomass resources' disposal or disposition. As a greenhouse-gas, reduced carbon (CH_4) is twenty-five times more potent than oxidized carbon (CO_2) on an instantaneous, per-carbon basis."

How the GHG emissions are regarded in emissions accounting depends on many factors: changes in wildfire risk, frequency, extent, and severity; timing of emissions, the chemistry of environmental transformations; human interventions; applied logic and assumptions; assumed time periods of analysis; substitutions of biomass for fossil fuels; and other avoided impacts, philosophy, and other factors.

The perplexities of the burning of biological carbon can be somewhat resolved by a thorough life-cycle analysis (LCA). Without a comprehensive life-cycle analysis, carbon neutrality cannot be claimed, quantified, or denied.

A formula used by US Forest Service economists for carbon neutrality is:

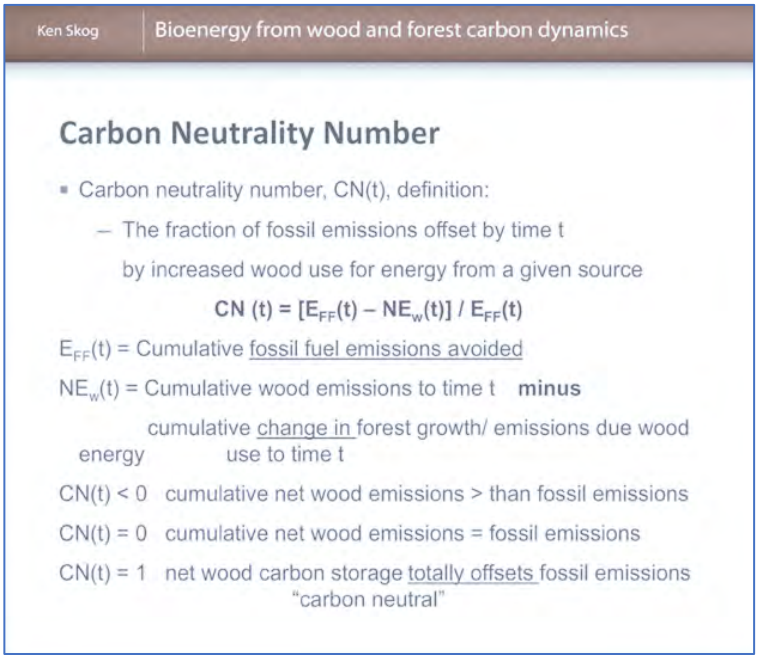


Figure 2: *How the US Forest Service calculates a "carbon neutrality number". By US Forest Service economist Ken Skog. From: Swanston, Chris; Furniss, Michael J.; Schmitt, Kristen; Guntle, Jeffrey; Janowiak, Maria; Hines, Sarah, eds. 2012. Forest and grassland carbon in North America: A short course for land managers. Gen. Tech Rep. NRS-93.*

Considerable research effort is underway to more accurately assess the environmental and social impacts of biomass, including life-cycle assessment modeling and tool development at the Schatz Energy Research Center at Humboldt State University.

As assessed in Morris 2008, biomass burning changes the timing of GHG emissions as shown in Figure 3.

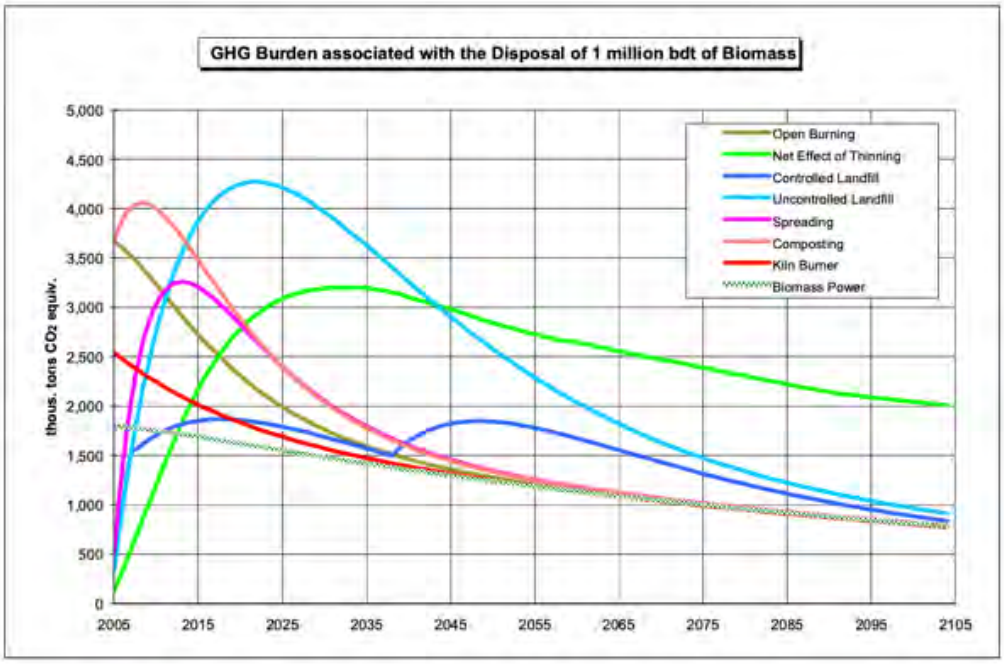


Figure 3: *The curve for stack emissions from the biomass energy alternative is based on the immediate release of virtually all of the fuel-bound carbon as CO_2, followed by its gradual clearance from the atmosphere. The conversion of one million bdt of biomass leads to emissions of 1.75 million tons of biogenic CO_2 equivalents. Open burning and low-efficiency combustors (kiln boilers and fireplaces) also produce their emissions immediately, but their greenhouse-gas emissions are higher, in terms of tons of biogenic CO_2 equivalents, than those of the power alternative because of the release of black carbon and other products of incomplete combustion. (Morris, 2008).*

Air Quality Issues and Concerns

There is growing worldwide recognition of the adverse health effects of smoke and other forms of air pollution that lead to a wide variety of serious human diseases and can shorten lifespans. Impacts can be especially severe for the young and infirm. Smoke from wildfires, open burning, biomass production, campfires, indoor cooking, and even candle burning can negatively impact human health. Recent large wildfires have exposed many city-dwellers to high levels of smoke and have sharpened awareness of this source of air pollution and its health consequences.

Smoke from burning wood emits several pollutants of concern, but by far the most serious is fine particulate matter – small particles that can pass through the lungs into the bloodstream. Small particles of 2.5 microns and below ($PM_{2.5}$) are of the most

significant impact and concern. There is no safe level (No Effect Level or NOEL) recognized for exposure to small particulate matter.

Other pollutants in smoke include nitrogen oxides, carbon monoxide, volatile hydrocarbon compounds, and secondary production of ground-level ozone.

The California Context for Biomass Power

In 2018, the California Department of Forestry and Fire Protection published *California's Forest Carbon Plan*.

- 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 significant impediments to forest restoration and ongoing forest management.

Near-term actions proposed by the state include:

- 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.

The current status of biomass power facilities in California is shown in Figure 4.

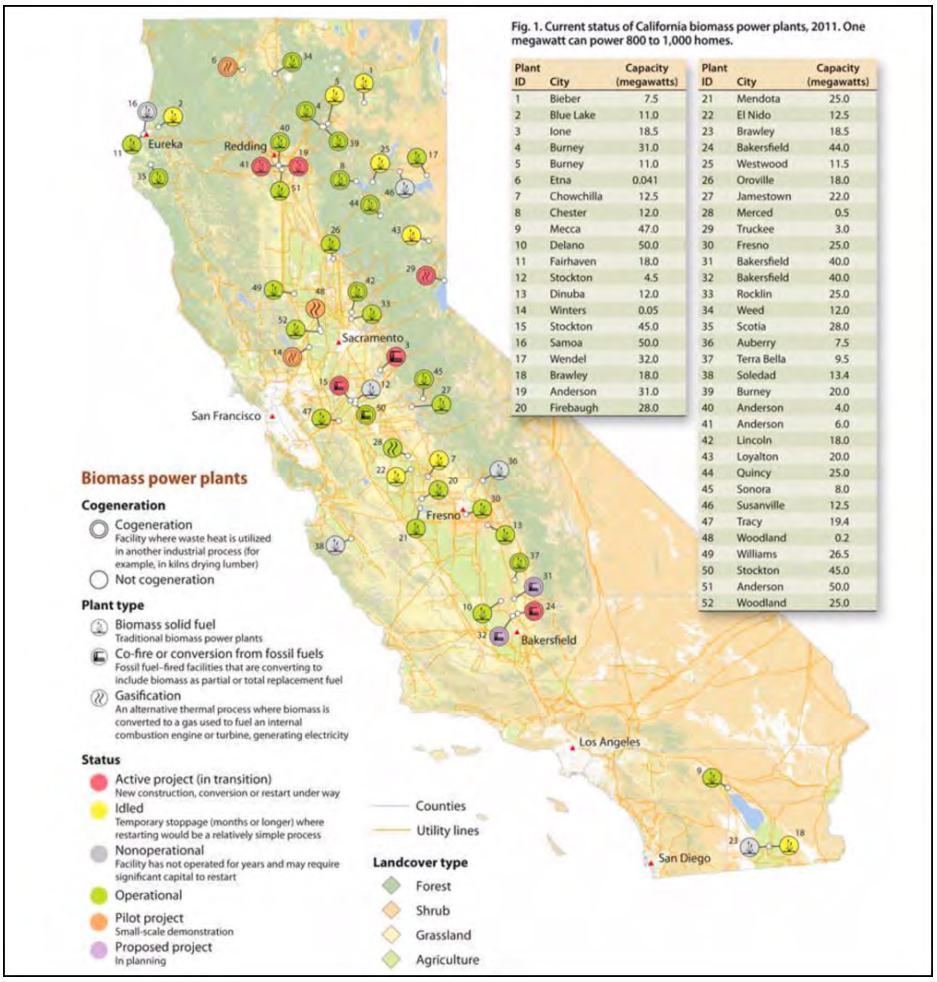


Figure 4: *Current status of biomass power facilities in California. Map source: UC Division of Agriculture and Natural Resources. As the wood products and bioenergy landscapes in California are quite dynamic, some of the 2012 data presented here may no longer be accurate. The University of California maintains an up-to-date wood facility database at:* https://ucanr.edu/sites/WoodyBiomass/Project/California_Biomass_Power_Plants/

The Humboldt County Context for Biomass Power

Humboldt County has 3 biomass power plants. Only one of these is currently running and under an RCEA Power Purchase Agreement (PPA). A timeline of operation of these three plants is below.

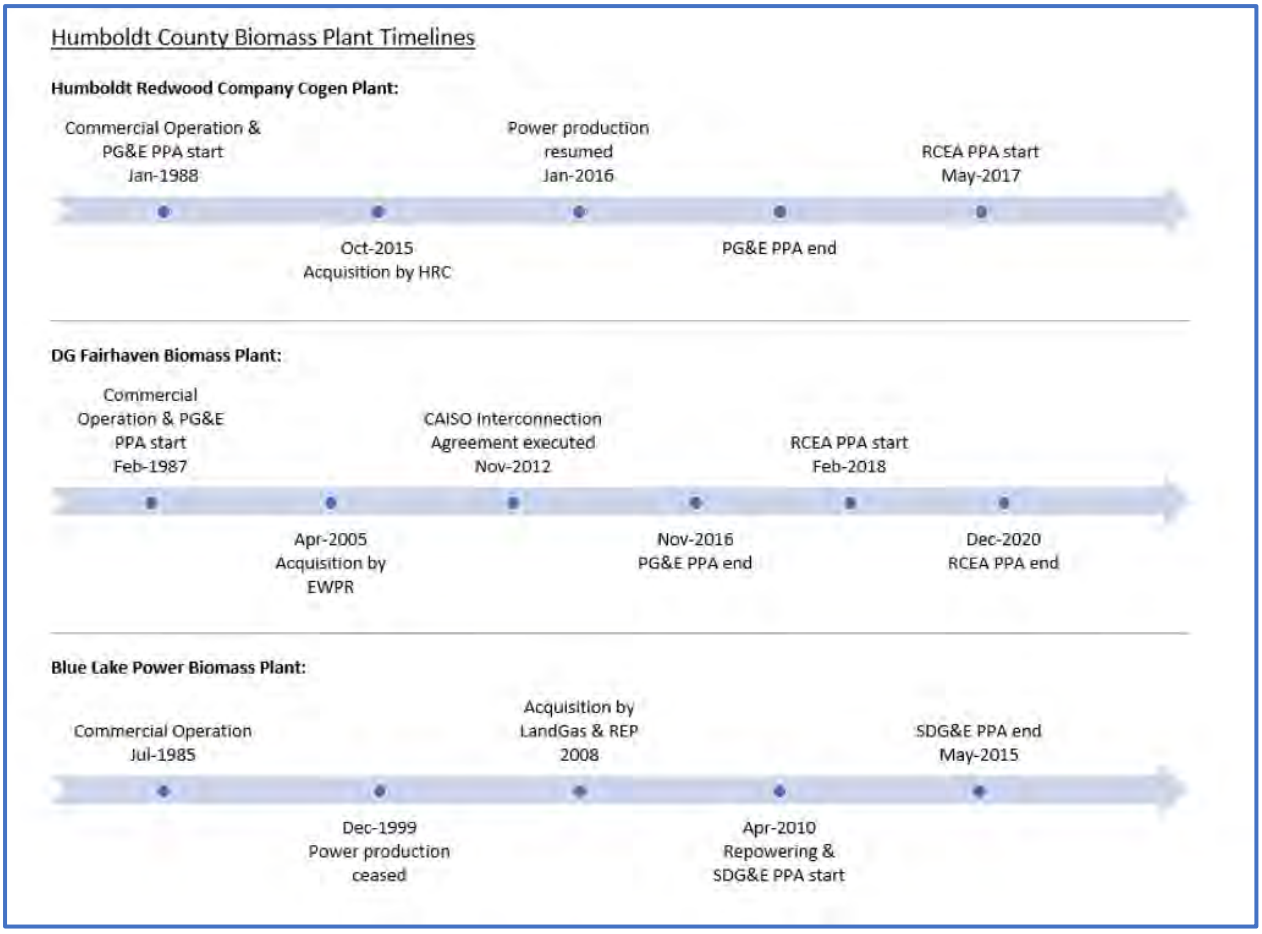


Figure 5. *Timelines for 3 biomass power plants in Humboldt County*

Biomass is presently the only local renewable energy source in use in Humboldt County, with the minor exceptions of small solar installations and several small hydroelectric installations.

Humboldt County produces enough electricity for local consumption, using biomass and natural gas (RePower 2013). Additional renewable generating capacity might increase soon if planned offshore wind power is installed and solar installations are built.

Biomass can generate continuous power output to the grid, contributing to meeting variable electricity demand and complementing the power available from intermittent solar and wind.

In Humboldt County, biomass electricity, primarily using mill residues, has been generating heat and electricity since the late 1980s. A local lumber manufacturing economy has been operating here for well over a century. Lumber mills generate remarkably large volumes of unusable wood materials, mostly sawdust, bark, and cutoffs. These have been disposed of in open burning until this was prohibited, and currently mainly in biomass generation plants.

The primary determinant of the quantity of mill residues used as fuel in California is the level of activity in the primary forest-products industry.

Figure 6: *Unsaleable mill residues can look like this but vary in composition, sizes, and moisture content. A large proportion of this residue is in the form of sawdust.*

Historically, mill residues that could not be sold as byproducts was burned in "tipi burners." During the height of timber harvest in Humboldt County, approximately 200 mills were operating – and each had a "tipi burner" that burned mill residues around the clock. During this era, a great deal of unfiltered smoke was emitted. Many of these burners can still be seen today at old mill sites.

Figure 7: *"Tipi burners" were common prior to stringent air pollution control regulations. Every mill had one, and they usually operated 24/7/365. The resulting air pollution was far worse than the comparatively efficient burning conditions with pollution controls in modern biomass plants.*

Feed Material for the biomass plants

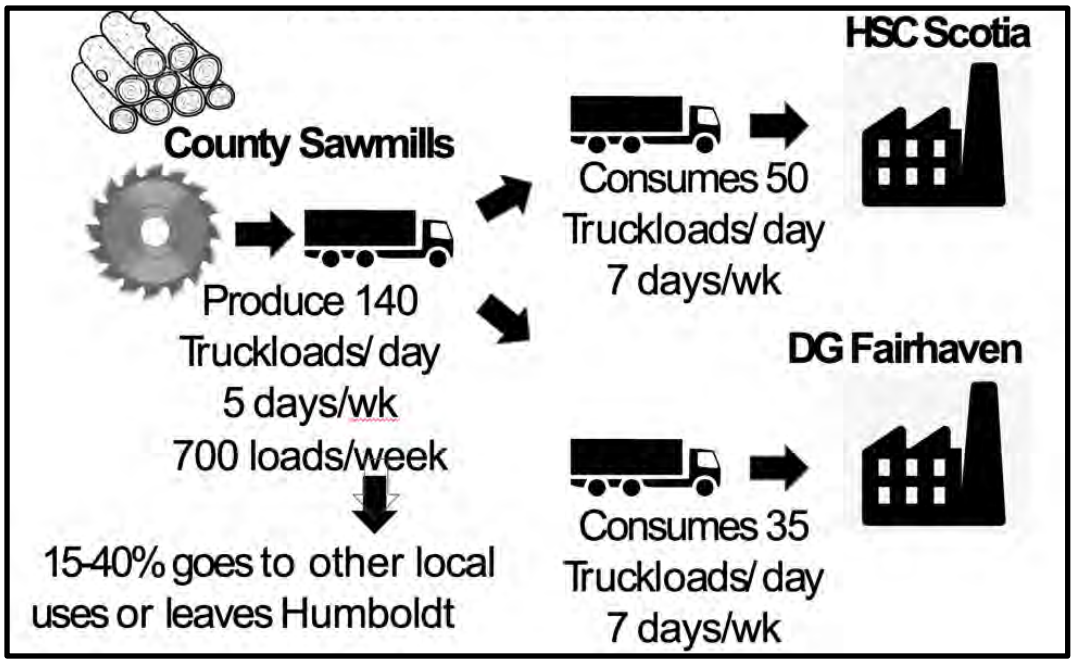


Figure 8: *Typical currently-produced quantities of mill residues, based on queries to mill operators, via Yana Valochovic (personal communication). The feed material for the two contracted plants are residues from local lumber mills that are not otherwise used for salable byproducts of lumber manufacture. Small amounts of logs from arborists and sanitation of logs killed by Sudden Oak Death are also included. Small quantities of waste logs from forest thinning on public land have been burned at DG Fairhaven in the past. Graphic by Richard Engel of RCEA.*

Lumber mill operations have seen a steady decrease in the amount of residues per unit of lumber production via the use of computer analysis of logs for optimum lumber yield, low-kerf saws, and other technology.

Air Pollution Produced by Local Biomass Plants

Biomass power in Redwood Coast Energy Authority's (RCEA's) mix is generated by burning mill residue, comprised of woody material from lumber mills. Burning wood creates smoke. Smoke includes air pollutants that adversely affect human health to those exposed.

	$PM_{2.5}$ (lb./ton)	NOx (lb./ton)	CO (lb./ton)	VOCs (lb./ton)	CO_2 (lb./ton)
Industrial (dry fuel)	0.7-6.5	8.8	10.8	0.31	3120
Residential Stove	6-23	2-14	46-160	10-44	~2800
Prescribed Burn	12-34	6	167	19.0	~2700
Wildfire	~30	4	140	12-24	~2600

Table 1: Emissions by type of combustion in pounds emitted per ton of woody biomass consumed. References: USEPA, AP12, Fifth Edition. McDonald et al. 2000, Environmental Science and Technology. USDA Forest Service, various reports

Air Emissions	Coal Fueled Boiler (lb./MMBtu)	Biomass Fueled Boiler (lb./MMBtu)	Natural Gas Boiler (lb./MMBtu)
CO	0.02-0.67	0.60	0.058
CO_2 fossil	178-231	0	117.6
CO_2 non-fossil	0	195.0	0
NOx	0.27-1.15	0.22-0.49	0.031-0.27
SOx	1.3	0.025	0.0005
VOCs	0.002-0.048	0.017	0.005
Methane	0.002	0.021	0.002
Particulates	0.37-2.4	0.05-0.56	0.007

Table 2: Average air quality impacts for boiler-spinner electricity generators

Pollutant	Description	Health Effects	Welfare Effects
Carbon Monoxide (CO)	Colorless, odorless gas	Headaches, reduced mental alertness, heart attack, cardiovascular diseases, impaired fetal development, death.	Contributes to the formation of smog.
Sulfur Dioxide (SO_2)	Colorless gas that dissolves in water vapor to form acid, and interact with other gases and particles in the air.	Eye irritation, wheezing, chest tightness, shortness of breath, lung damage.	Contribute to the formation of acid rain, visibility impairment, plant and water damage, aesthetic damage.
Nitrous Oxides (NO_2)	Reddish brown, highly reactive gas.	Susceptibility to respiratory infections, irritation of the lung and respiratory symptoms (e.g., cough, chest pain, difficulty breathing).	Contribute to the formation of smog, acid rain, water quality deterioration, climate warming, and visibility impairment.
Ozone (O_3)	Gaseous pollutant when it is formed in the lower atmosphere.	Eye and throat irritation, coughing, respiratory tract problems, asthma, lung damage.	Plant and ecosystem damage.
Lead (Pb)	Metallic element	Anemia, high blood pressure, brain and kidney damage, neurological disorders, cancer, lowered IQ.	Affects animals and plants, affects aquatic ecosystems.
Particulate Matter (PM)	Very small particles of soot, dust, or other matter, including tiny droplets of liquids.	Eye irritation, asthma, bronchitis, lung damage, cancer, heavy metal poisoning, brain damage, cardiovascular effects.	Visibility impairment, atmospheric deposition, aesthetic damage.

Table 3: Health and welfare effects of common pollutants (from: Furniss 2017)

Note: Both contracted local plants use grid power for start-up and ongoing operation, much of which is from fossil carbon (natural gas).

Permitted air pollutant discharges

HRC Scotia permitted discharge of PM (all sizes) = 0.04 lbs./MMBtu

DG Fairhaven permitted discharge of PM (all sizes) = 0.10 lbs./MMBtu

Blue Lake permitted discharge of PM (all sizes) = 0.04 lbs./MMBtu

Year	Facility	Total GHG	Non-Biomass GHG	Biomass CO2
2016	DG Fairhaven Power LLC	87,243	6,158	81,085
2016	Humboldt Sawmill Company	231,566	6,132	225,435
2016	PG&E Humboldt Bay Generating Station	171,847	171,847	0

Year	Facility	CO2	CH4	N2O	VOC	NOx
2016	DG Fairhaven Power LLC	85,532	27.75	3.64	8.9	74.8
2016	Humboldt Sawmill Company	226,819	76.95	10.1	36.9	174.8
2016	PG&E Humboldt Bay Generating Station	171,676	3.26	0.33	15.9	24.9

Year	Facility	SOx	PM10	PM2.5	Diesel PM	Formaldehyde	Hydrochloric Acid
2016	DG Fairhaven Power LLC	12.7	14.3	13.3	8.63	4,457	19,222
2016	Humboldt Sawmill Company	34.6	37.4	34.5	56.6	12,376	442
2016	PG&E Humboldt Bay Generating Station	1.2	5.2	5.2	129	1,933	

Table 4: *Reported greenhouse gas and air pollutant emissions for 2016. Data from California Environmental Protection Agency Air Resources CARB Pollution Mapping Tool. Accessed 11/18/2019*

The current annual fine particle standard has been revised from the current 15.0 micrograms per cubic meter ($\mu g/m^3$) to 12.0 $\mu g/m^3$. An area will meet the standard if the three-year average of its annual average $PM_{2.5}$ concentration (at each monitoring site in the area) is less than or equal to 12.0 $\mu g/m^3$.

Air Resources Board

iADAM

Select 8 Summary

FAQs

Monitoring Sites	PM2.5 State Annual Average				
	2014	2015	2016	2017	2018
	Humboldt County				
Eureka-Humboldt Hill	7.4	4.7	*	*	*
Eureka-Jacobs	*	5.8	6.0	*	7.7

Air Basins	PM2.5 State Annual Average				
	2014	2015	2016	2017	2018
	California				
North Coast Air Basin	7.4	7.9	6.4	9.4	11.3

Note: * There was insufficient (or no) data available to determine the value.

Table 5: *Comparison of Eureka-Humboldt PM2.5 averages for 2014 to 2018 with statewide values.*

The annual standard is 12.0 $\mu g/m^3$. Last five years: 5.8 – 7.7 $\mu g/m^3$.

Table 3.12-2. Criteria Pollutant Concentrations in Humboldt County, 2011-2015.

Pollutant	State Std.[a]	National Std.[a]	Pollutant Concentration by Year[b]				
			2011	2012	2013	2014	2015
Ozone (ROG, NOx, CO)							
Highest 1-hour average (State), ppm	0.09	--	0.047	0.053	0.055	0.049	0.060
Days over State Std.[f]			0	0	0	0	0
Highest 8-hour average (State/national), ppm	0.07[c]	0.075	0.043/ 0.043	0.049/ 0.048	0.049/ 0.049	0.043/ 0.043	0.053/ 0.052
Days over State Std.			0	0	0	0	0
Days over National Std.			0	0	0	0	0
Respirable Particulate Matter (PM_{10})							
Highest 24-hour average (state national), µg/m³	50	150	**53.9/ 49.6**	46.3/ 44.5	**66.7/ 64.3**	ND[d]/ 104.7	ND[d]/ 54.9
Days over State Std.			6.1	0	11.8	ND[d]	ND[d]
Annual average (State), µg/m³	20[e]	--	19.1	16.8	19.3	ND[d]	ND[d]
Fine Particulate Matter ($PM_{2.5}$)							
Highest 24-hour average, µg/m³	--	35	24.8	22.3	28.1	21.2	18.6
Days over National Std.			ND[d]	0	0	0	0
Annual average (National), µg/m³	12	15	6.6	6.7	7.1	3.0	4.6

Notes:
Bold = in excess of standards
ppm = parts per million; µg/m3 = micrograms per cubic meter
[a] COE, 2008.
[b] ARB, 2016b (ozone data are from the Eureka-Humboldt Hill monitoring station while PM_{10} and $PM_{2.5}$ data are from the Eureka-Jacobs and monitoring station).
[c] In 2006, the State approved amendments to the regulations for the State Ambient Air Quality Standard for ozone establishing a new 8-hour average ozone standard of 0.070 parts per million (ppm).
[d] No data available.
[e] The national annual PM_{10} standard was revoked in December 2006 (ARB, 2008a).
[f] The national 1-hour ozone standard was revoked in June 2005 (ARB, 2008a).
Source: ARB, 2016b; compiled by ESA.

Table 6: *A sampling of criteria pollutant concentrations for Humboldt County and state and national standards.* (*USEPA 2012 The National Ambient Air Quality Standards for Particle Pollution Revised Air Quality Standards for Particle Pollution and Updates to The Air Quality Index (AQI))*

Air Quality and Ambient Air Monitoring in Humboldt

Air quality is continuously monitored in Eureka and is usually in the "good" category, considered "healthy" and "attaining" USEPA air quality standards, except sometimes for particulate matter. Humboldt County is a considered a "Non-Attainment" area for PM_{10} particulate air pollution.
No official monitoring of ambient air quality is done in Fairhaven or Scotia, where exposure to biomass emissions would be expected to be the greatest.

The North Coast United Air Quality Management District (NCUAQMD) has issued permits to the three biomass plants in Humboldt County. Emissions are monitored at the stack of the 2 operating plants in each location. However, no official monitoring of ambient air quality is done in Eureka, Fairhaven, Scotia, or Blue Lake, where exposure to biomass emissions would be expected to be the greatest.

Site emissions alone do not accurately describe the public health hazard; measured human exposure to emitted pollutants is necessary to understand public health impacts. Unfortunately, this data is not currently available. The District has stated that it has conducted exposure modeling in formulating the permits but that this information is not publicly available. Currently, ongoing exposure modeling and monitoring are not being conducted.

In the absence of exposure modeling and monitoring, public health risks cannot be quantified or described. Scotia, DG Fairhaven, and Blue Lake plants are proximate to population centers. The DG Fairhaven plant is across a typically windy Humboldt Bay from the Eureka population but is proximate to the community of Fairhaven.

Biomass Plant Air Quality Controls

The emission control tools utilized at the two RCEA-contracted plants include (from their permits):

DG Fairhaven

- Mechanical Multicyclone Collector
- Electrostatic Precipitator
- Forced Overfire Air System

HRC Scotia

Particulate matter is controlled with multiple cyclones followed by an electrostatic precipitator manufactured by General Electric Co. The unit has three separate transformer/rectifier fields and a collection plate area of 42,120 sq. ft. Two of the fields are rated at 50 KVA and one at 35 KVA. A forced overtire air system is utilized to help control gaseous emissions.

Concerns About Forest Health and Sustainability

The source material for biomass burning is a central issue in most biomass power locations. That is, concerns are frequently raised about unsustainable pressure to harvest forests and the utilization of agricultural lands for products other than food production.

These are not currently predominant concerns in Humboldt, as the feed material is primarily mill residue only. The minor exceptions are that the plants accept arborist waste and sanitation logs that must be burned, such as tanoak infected with Sudden Oak Death disease.

While current biomass plant material requirements are currently satisfied by mill residues, some additional capacity exists at HRC Scotia, and more could be added, and new plants could be built. This could lead to markets diverting more mill residues than currently utilized, and forest management activities could produce source material for the plants.

Additionally, some forestry officials in California are working to increase thinning and controlled burning to reduce wildfire hazards and improve forest health. Pre-commercial thinning for fuel reduction is expected to increase markedly throughout California forests in the near future. Considerable funding is becoming available for this work. Large amounts of small logs and slash will be generated.

However, the economics of transport primarily keeps this material in the woods; it is simply not worth the transportation costs to bring it to the mills or the biomass plants. A haul of more than ~50 miles is considered to be economically infeasible as

the transportation costs would exceed the market value of the material. The small logs and slash must therefore be treated in the woods to reduce fire hazards and enable regeneration.

There are several active research and development projects, including a local effort to evaluate various means of on-site processing of fuel treatment thinning and the associated large volumes of slash. These methods include more efficient burning processes, wood-energy concentration to extend the economically feasible transportation distance, and the production of biochar.

Because sawlogs are always far more valuable for lumber manufacturing than for burning in biomass plants, logging to feed biomass plants is not likely to occur.

Support for and Opposition to Biomass-Generated Electricity

Support:

Some groups have publicly supported this technology, including forestry and timber manufacturing professionals, primarily because it supports their industry. Climate scientists and specialists are also generally in favor of biomass as a bridge solution, but with caveats. California Air Pollution Control Officers Association (CAPCOA) has also issued a written statement in favor of biomass as a way to limit air pollution from other methods of residues incineration or adding to it to landfills.

Opposition:

Currently, public opposition to biomass burning is substantial. Vocal opponents come to the RCEA Community Advisory Committee and California Air Resources Board meetings and express opposition and concerns, primarily about air pollution, GHG emissions, and forest management.

Additionally, many medical professionals, as represented by several professional medical societies, and two local physicians, have strong concerns and opposition due to particulate air pollution and GHG emissions. For a summary of particulate pollution and health, see: (https://www.epa.gov/sites/production/files/2014-05/documents/huff-particle.pdf).

Opponents frequently note that biomass cannot be considered “clean” because it emits both air pollutants and GHGs. There is no broadly accepted definition of “clean” energy. In the context of energy and climate in California, “clean” means “non-fossil and non-nuclear” and not that there is no associated pollution.

Nationally, health organizations that have publicly opposed biomass power include: the American Academy of Pediatrics, American Lung Association, American Public Health Association, Asthma, and Allergy Foundation of America, National Association of County & City Health Officials, National Environmental Health Association, Trust for America’s Health, Children’s Environmental Health Network and Physicians.

Local environmental organizations that have weighed in on these issues include 350-Humboldt and the Environmental Protection Information Center (EPIC), and both are "neutral" at the time of writing.

Exceptions exist within each of these groups and gaining the full support of the community is not likely or possible.

What Happens to Mill Residues if RCEA no Longer Buys Power from the Plants?

As noted, a large volume of residue is generated at local mills. If biomass is not burned for electric generation locally, options for disposal include:

- HRC Scotia uses biomass power for mill operations, and heat from the plants for lumber drying, and so would continue to run at some level even if there were no electricity buyers.
- Material could be transported out of the county to other biomass plants or to landfills. For example, the material could be transported to Anderson, California (or other more distant plants) for burning in the Wheelabrator biomass plant there, which is about 300 miles round trip.
- Because open burning is unlikely to be permitted locally due to air pollution regulations, the residue could be hauled to an acceptable open burning location.
- Plants sell electricity to other buyers, such as a community choice energy program serving jurisdictions outside of Humboldt County, as many municipalities have a mandate for renewable energy and biomass power "counts" as a renewable source.
- A final option would be closing the mills and sending logs out of the county for milling, likely to Oregon. Prices for local logs would decrease substantially. This would have the unfortunate effect of making restoration forestry, road maintenance, and wildfire-resilience thinning, all of which are expensive, less feasible, and less likely to be practiced.

None of these options eliminates GHG emissions, and most would increase both air pollution and GHG emissions. Landfilling of mill residues could decrease air pollution but substantially increase GHG emissions, including methane. However, current severe systemic societal waste disposal challenges would worsen, and landfills might not accept such large quantities of organic wastes.

Other Options for Mill Residue Disposal

Discovering or developing additional products and markets for the residues

Mill operators are always looking for new and re-emerging byproduct markets for mill residues. The potential depends on the existence of markets, levels of demand, manufacturing technologies, and distance to markets. The quality of the unused material is often substandard for any commercial uses and sales: it is too variable in

size, often has rock and dirt contamination, and has variable moisture content. Unless the provenance of the material in the piles is verifiably known, insect and pathogen non-presence cannot be assured.

Residues are currently and potentially sold as "byproducts" for the following:

- Chips for paper manufacture, mostly to Asia, but also the PNW states. Paper manufacture requires large, clean chips, and there is currently a market for these over the Fairhaven Loading Dock.
- Small amounts of residues are sold for compost-making, landscaping, animal bedding, playground mulch, and so on.
- Burnable wood pellets are commonly produced and sold from Eastern USA forests for sale to the EU, Japan, and other places to substitute for coal burning as climate mitigation. There might be a potential market for local burnable pellets, particularly for industrial use, where feed material quality and polish are less critical than for consumer-grade pellets.

A challenge to selling byproducts is that interstate and international quarantines exist to prevent the introduction of pathogens and invasive insects. This is a barrier to export for some types of sales.

Emerging technologies include: gasification, torrefaction, biochar, and others are in active research and development locally and elsewhere.

Gasification converts woody materials into gasses by reacting the material at high temperatures (typically >700 °C) with little oxygen. The product is wood-gas fuel that can be burned as fuel in furnaces, stoves, and vehicles in place of gasoline, diesel, or other fuels. Biochar is a byproduct.

Gasification is relatively expensive and energy-intensive. The moisture content of the feedstock must be carefully controlled. Some of the sawmill residues could be diverted to a gasification plant, but it would require a significant capital investment and tight controls on the quality of the feedstock. The material would be burned with the associated carbon emissions. Gasification technology is not currently at a feasible scale to process the amount of available local sawmill residues.

Torrefaction increases the energy density of wood and involves the heating of biomass in the absence of oxygen to a temperature of typically 200 to 400°C. The weight loss is about 30%, but the energy loss is ~10%. The main product is the solid, torrefied biomass, either as torrefied wood material or briquettes. During the torrefaction process, combustible gas is produced that provides heat to drive the process. *(Biomass Technology Group, Accessed 11/11/19)*

Torrefaction produces material to burn for heat or electrical generation, not for carbon sequestration.

A discussion of biochar may be found on Page 23.

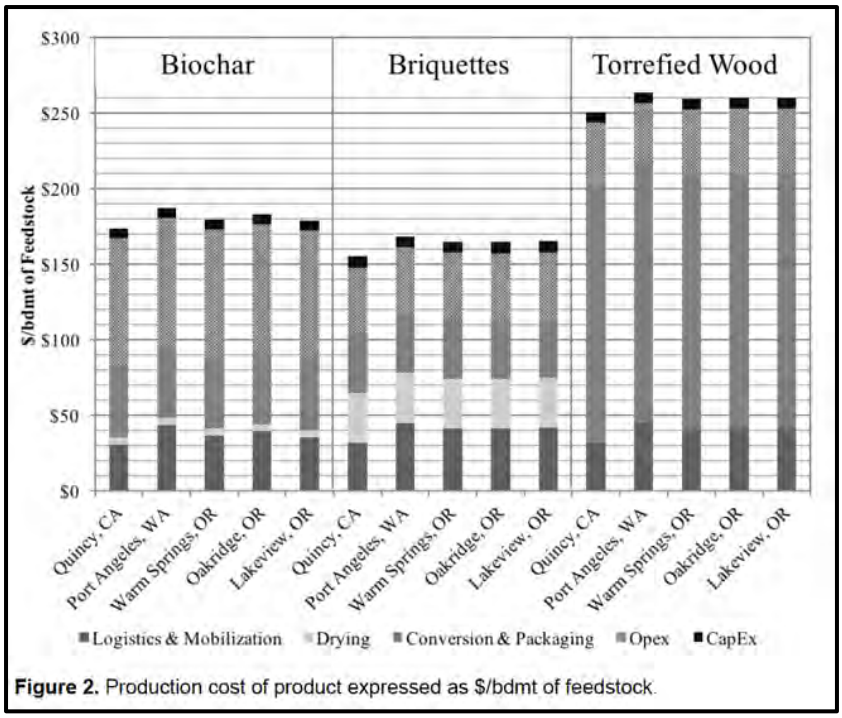


Figure 9: *Cost comparison for production of biochar, torrefied briquettes, and torrefied wood. From: Waste to Wisdom. 2018. Utilizing forest residues for the production of bioenergy and bio-based products.*

Potential Ways to Achieve Long-term Sequestration of Carbon in Local Mill Residues

A substantial opportunity exists for carbon sequestration of the embodied carbon in mill residues if a method to do this can be developed at the required scale and is economic against other options for disposal. To be meaningful for climate change, carbon must be sequestered for decades to a century or more.

Manufactured products

Manufactured building materials can be an effective means of sequestering the carbon in mill residues, but at present, requires high-quality starting material. Sawdust, mill ends, and cutoffs are generally not suitable. That is, some mill residues can be manufactured into long-lived building materials, but a substantial residue of unsuited materials will always remain.

Composting

Composting of the non-salable residues is a commonly suggested method for mill residues disposal and creating a valuable product.

Sawdust is commonly added to biosolids (sewage sludge, kitchen waste, or both) in making compost to add carbon-rich materials. Compost manufacture and biosolids disposal is the objective of these efforts, not mill residue disposal, and the operational

scales are tiny when compared to the volume of local mill residue. Demand for compost that contains biosolids is limited by societal acceptance.

Advantages of composting

Compost improves soil fertility, and increased soil fertility furthers soil carbon sequestration and supports plant growth.

Compost can substitute for synthetic nitrogen fertilizer, which is a significant source of NOx emissions. NOx is a powerful GHG and air pollutant and persists longer in the atmosphere than CO_2 or other GHGs.

A small proportion of compost can form long-term soil humus, especially when lignin-rich wood is the source material.

Compost creation at the needed scale entails substantial challenges:

- Most of the carbon in compost returns to the atmosphere in years or decades as compost decomposes. A small amount of compost might remain for climate-meaningful periods (100+ years), but the large majority does not remain for nearly that long.
- Local mill residues comprises a large volume of material. The scale is significant, and composting this amount of wood residue is unprecedented.
- Composting would require substantial energy inputs to process and transport the resulting compost.
- Processing and storing a large amount of compost presents fire hazards because the decomposition process generates and accumulates heat and compost fires are common.
- For composting to occur, nitrogen-rich material must be added to support decomposition. Sawdust is typically 325:1 carbon to nitrogen (C:N), while the rapid composting that is required to destroy pathogens and create high-quality compost needs a C:N ratio of 25-30:1. Sewage, kitchen waste, or green waste could provide the needed N, but concerns about transport, mixing, sanitation, weeds, pathogens, costs, and public nuisance would be present in any such operations.
- There are concerns about invasive plants and pathogens surviving the composting process and being introduced to fields where compost is applied. Most applications would require certified weed- and pathogen-free compost, and this can be difficult to achieve and ensure.
- The composting process releases methane and N_2O, especially powerful GHGs.
- There are limited local markets. An existing local green waste composting facility is currently producing more than the market demand. Non-local markets could likely be developed.

Biochar as a means to sequester carbon in woody residues

Producing biochar currently offers the most technically feasible option for sequestering the carbon in mill residues.

Biochar is a charcoal-type substance produced by burning biomass material in a controlled process called pyrolysis. During pyrolysis, biomass is burned in a container with little or no oxygen. During the pyrolysis process, the organic material is converted into biochar and wood gas. Wood gas can be used as a fuel and can help to power the pyrolysis process.

Biochar a highly stable form of carbon that does not decompose or return carbon to the atmosphere. Biochar converts the carbon in biomass to a stable, long-term material. However, only roughly half of the carbon in the feed material is sequestered. The pyrolysis process produces GHG emissions and air pollutants, though much less burning raw woody material for biomass electricity generation.

Figure 10: *Biochar is black, highly porous, lightweight, fine-grained, and has a vast surface area. Approximately 70 percent of its composition is carbon. The remaining material consists of nitrogen, oxygen and hydrogen, and other elements. Biochar's chemical composition varies depending on the feedstocks used to make it and methods used in pyrolysis.*

Biochar is a highly beneficial soil amendment, increasing water- and nutrient-holding capacity, enhancing soil biology, decreasing N_2O emissions from soils, and enhancing the sequestration of recalcitrant carbon in soil through improved soil fertility and plant growth. (Severy et al., 2018). Recent research points to electron channels in biochar that enhance soil microbial ecology (Sun et al., 2017).

Incorporating biochar into soils is a sound and tested method of storing carbon for long periods.

U.S. Forest Service research is demonstrating the benefits of making and using biochar. https://www.fs.fed.us/blogs/promise-biochar-forests-grasslands-and-farms

The potential to sequester carbon using biochar is well-recognized, and the methodology and production equipment are available.

However, using the large quantities of local mill residue to make, market, and distribute biochar requires further research and development to establish the economic, sociologic, market, and logistic costs and benefits.

A large-scale local pilot project to learn how this could be done would be a useful contribution to current limited regional information. A public-private partnership might be the best way to accomplish this.

A new report has just been published by the Sierra Club that examines the context and some of the details involved in alternatives to burning woody material from forestry operations. (Sierra Club, 2019).

Cellulosic nanomaterials as a means to sequester carbon in woody residues

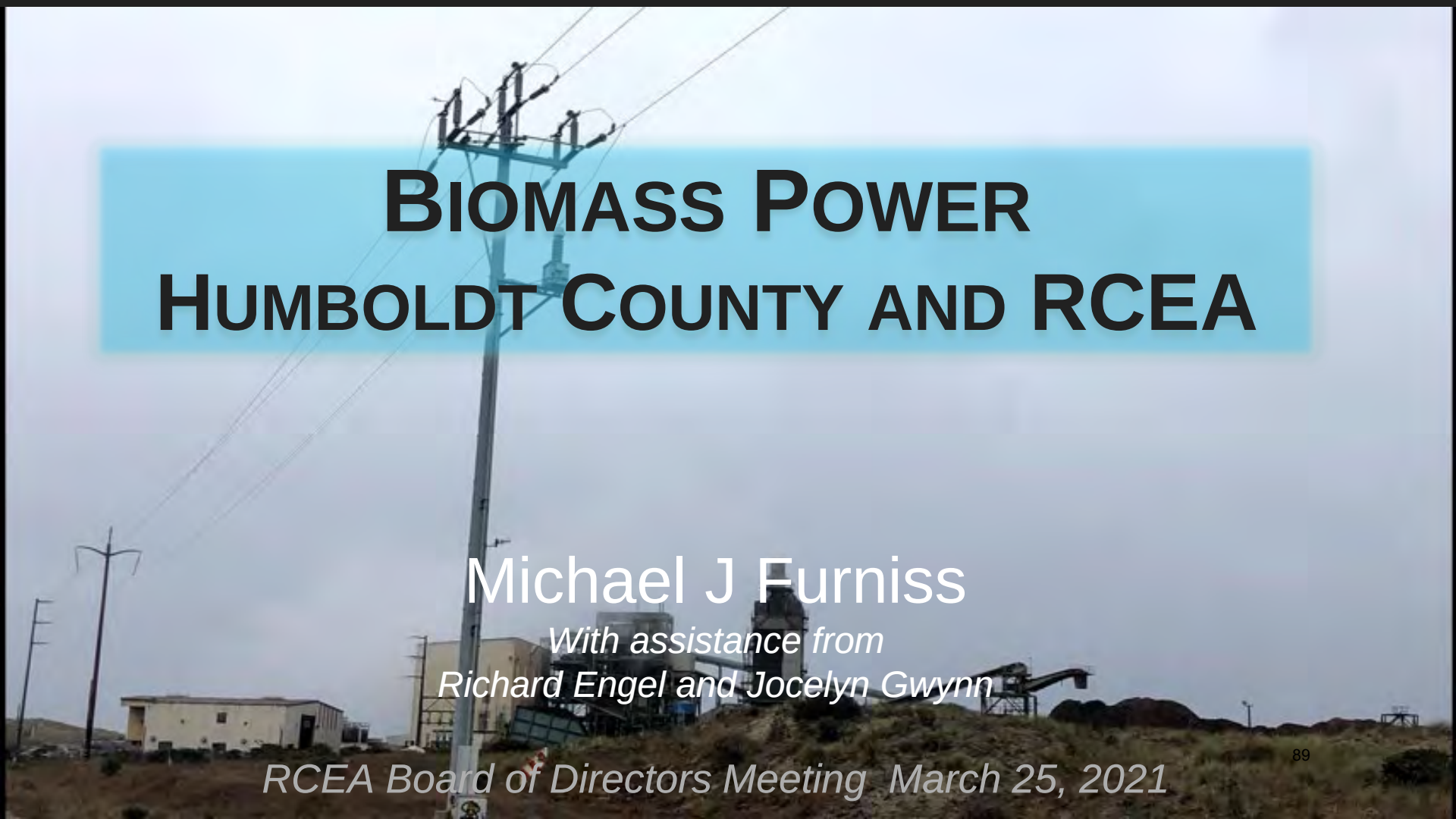
Nano cellulose has great potential for a wide variety of products, including biodegradable plastics substitutes, stronger and more flexible concrete, packaging, coatings, automotive components, paints, paper and paperboard, polymer composites, medical applications, electronics, aircraft components and many more.

Local mill residues are suitable starting material for creation of nano cellulose suspensions, which then can be made into diverse products.

RCEA is conducting research to determine the market and technical feasibility of manufacturing nano cellulose using mill residues.

	Potential GHG Impacts	Time Frame for Sequestration	Other Impacts/Considerations
Landfilling	Potential for substantial amounts of methane to be released, particularly if gases are not collected	Decades	California law may make it difficult to landfill organics. Methane production increases warming potential over alternatives. Less air pollutants.
Composting	5-20% of carbon sequestered but for short time periods; potential to release substantial amounts of methane	10-20 years	Benefits to the soil. Needs addition of N-rich material. Energy required for handling and processing. Potential multiplier effect with increased soil fertility increases. Substitutes for N fertilizer reducing associate N_2O emissions.
Raw biomass incineration	Most carbon converted to CO_2	Essentially instantaneous	Human health impacts. Not permitted where human exposure to air pollutants is high. Higher GHG effects
Gasification	Similar GHG emissions as raw biomass incineration	Essentially instantaneous	Typically more efficient than raw biomass incineration. May have lower air quality impacts.
Biochar production	~50-80% of carbon sequestered	100-1000 years	Expensive to scale. Particulates and GHGs are released during production. Benefits to the soil. Multiplier effect increasing plant growth and recalcitrant humus formation.
Nano cellulose	100% of carbon sequestered. Lowers the GHG emission for cement manufacture	Variable depending on product	Can produce biodegradable substitutes for plastics, make stronger concrete, wide variety of new products.
Production of charcoal or wood pellets for fuel	Similar GHG production as raw biomass generation. Depends on burning technology and transportation costs	No sequestration	There is some demand for wood pellets and charcoal products to substitute for the use coal in electricity production in Asia.
Sale and reuse, durable products, including mass timber products	Most or all carbon in residues sequestered (theoretically). Can substitute for concrete and steel, with large avoided emissions	Potentially, 100+ years	Requires adequate base material, sawdust, and end pieces are not suited for present technology. Potential environmental, health, and climate impacts from glues.

Table 7: *Options for mill residue disposal. Adapted and modified from Gurin et al., 2018*



Biomass Power
Humboldt County and RCEA

Michael J Furniss

With assistance from

Richard Engel and Jocelyn Gwynn

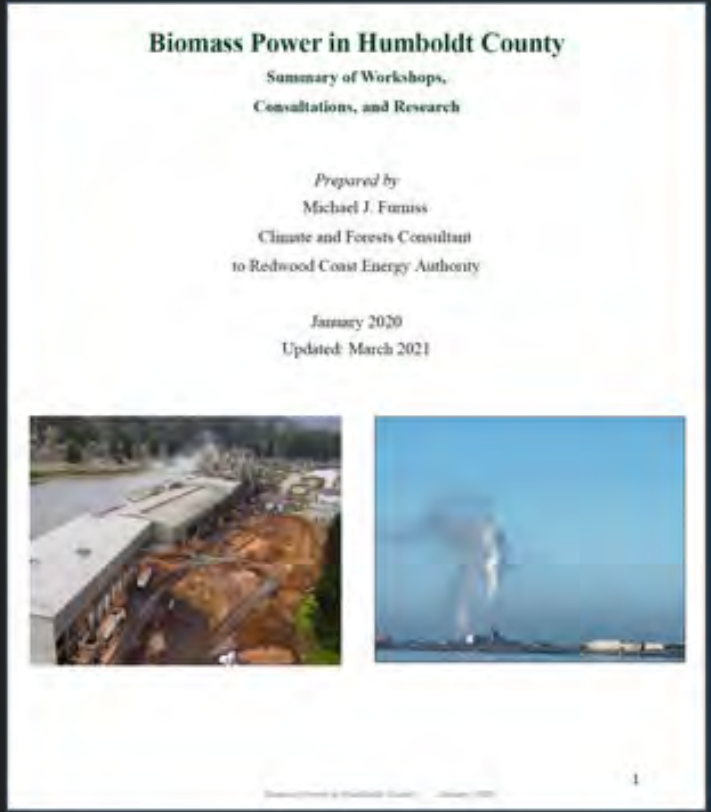
RCEA Board of Directors Meeting March 25, 2021

Topics

1. Background
2. Biomass power generation: plus and minus
3. Is biomass power “carbon neutral?
4. Alternative uses of mill residues

Fall of 2019

[Video of public meeting with expert panel]

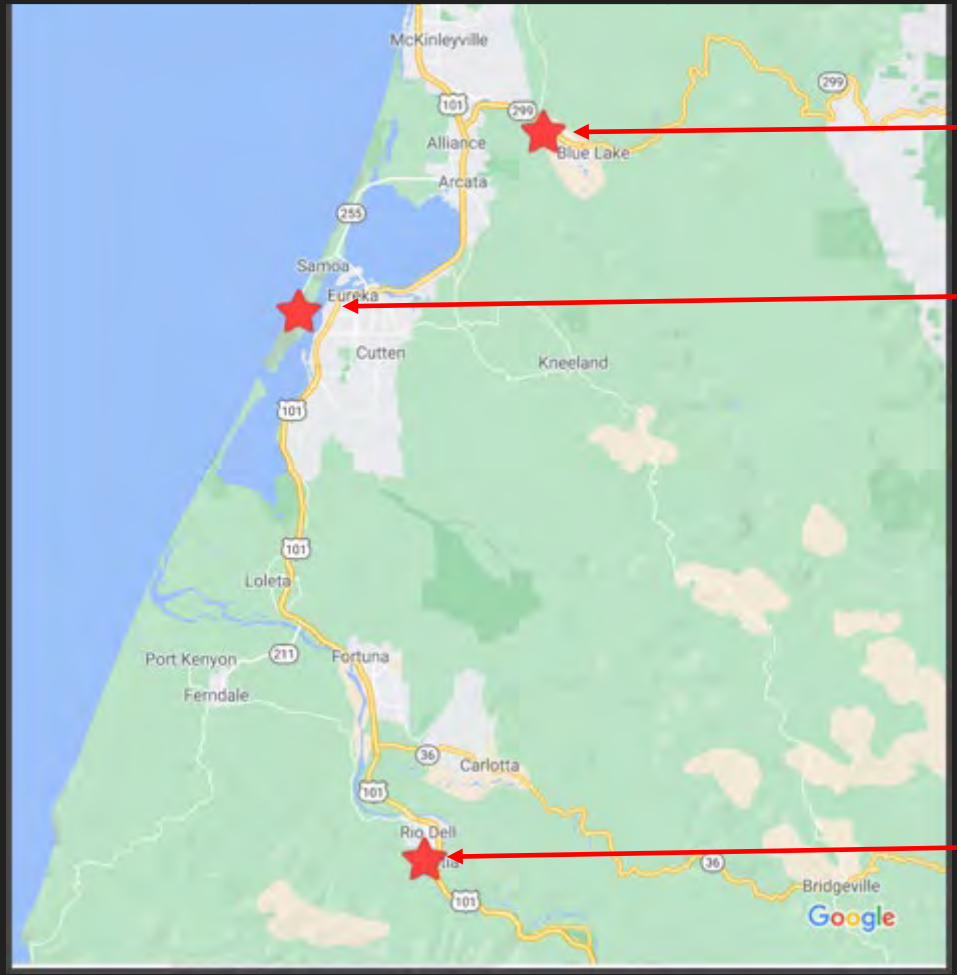


Biomass Power in Humboldt County

Summary of Workshops, Consultations, and Research

Prepared by
Michael J. Furniss
Climate and Forests Consultant
to Redwood Coast Energy Authority

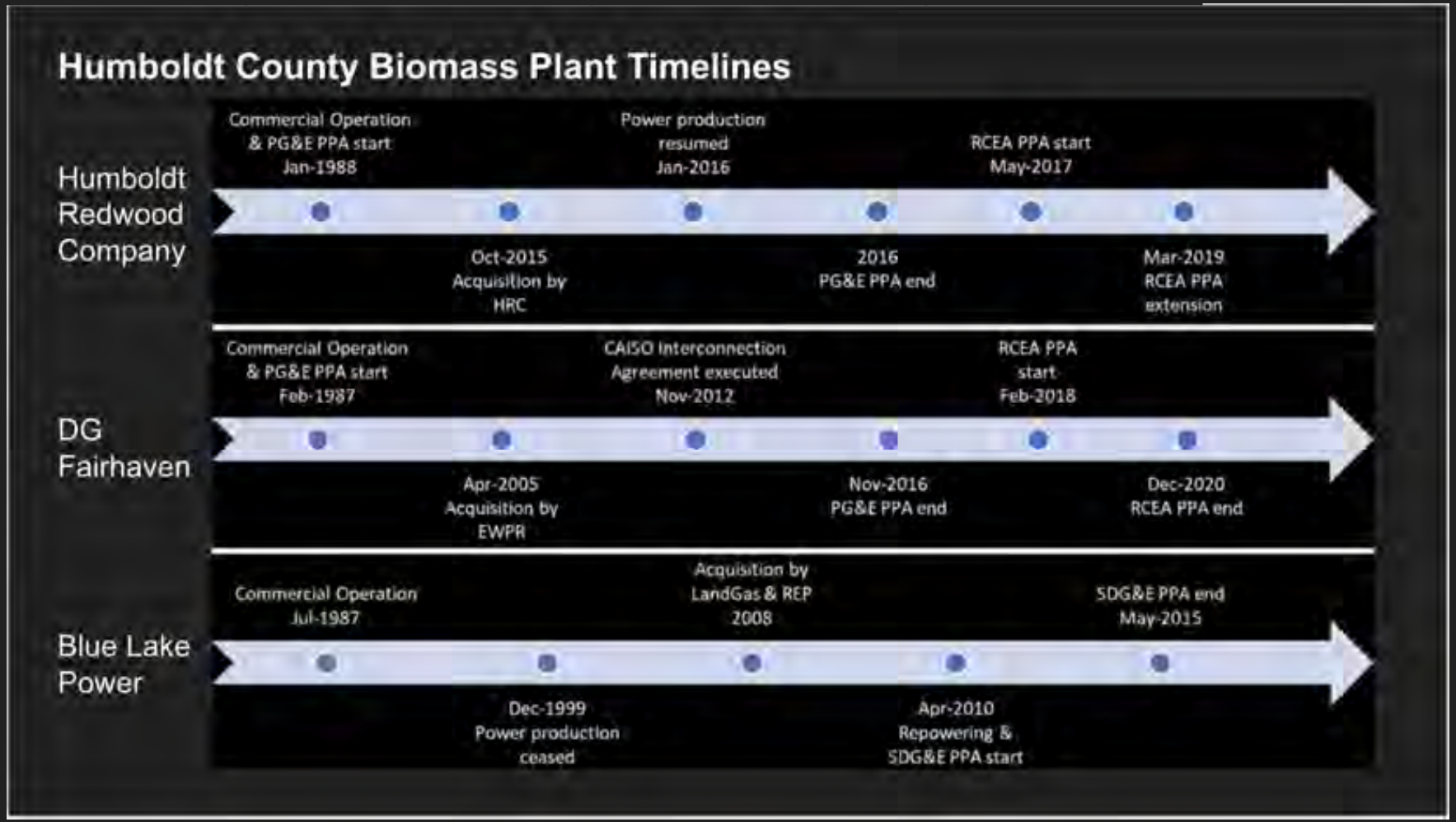
January 2020
Updated: March 2021



Blue Lake Power

DG Fairhaven

Humboldt Redwood Company


Humboldt County Biomass Plant Timelines
Humboldt Redwood Company
Commercial Operation & PG&E PPA start Jan-1988
Oct-2015 Acquisition by HRC
Power production resumed Jan-2016
2016 PG&E PPA end
RCEA PPA start May-2017
Mar-2019 RCEA PPA extension
DG Fairhaven
Commercial Operation & PG&E PPA start Feb-1987
Apr-2005 Acquisition by EWPR
CAISO Interconnection Agreement executed Nov-2012
Nov-2016 PG&E PPA end
RCEA PPA start Feb-2018
Dec-2020 RCEA PPA end
Blue Lake Power
Commercial Operation Jul-1987
Dec-1999 Power production ceased
Acquisition by LandGas & REP 2008
Apr-2010 Repowering & SDG&E PPA start
SDG&E PPA end May-2015

Biomass Power Generation

+ Advantages

Dispatchable power

Substitutes for fossil sources

In the carbon cycle

Uses excess mill residues

Regarded as a climate solution

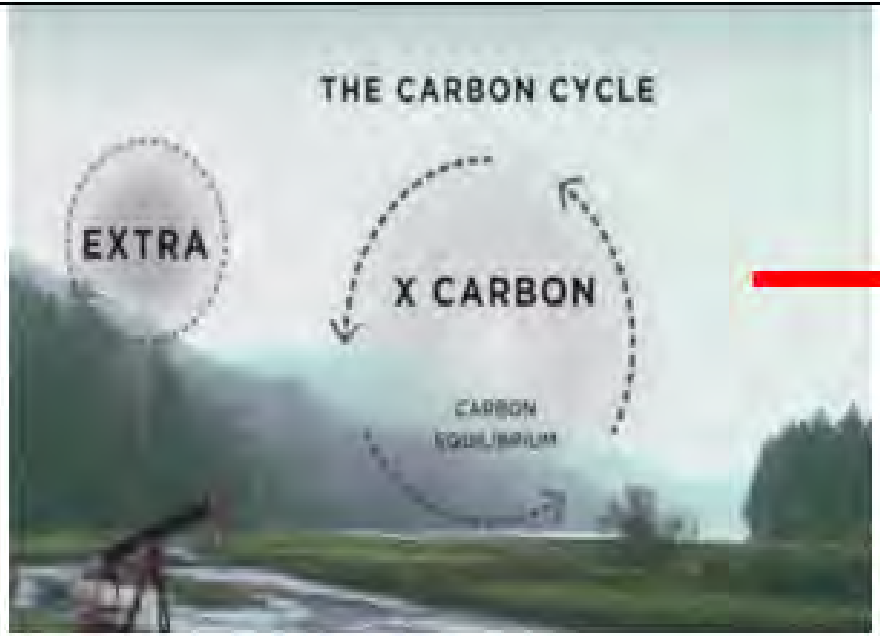
– Disadvantages

Emits greenhouse gasses and black carbon

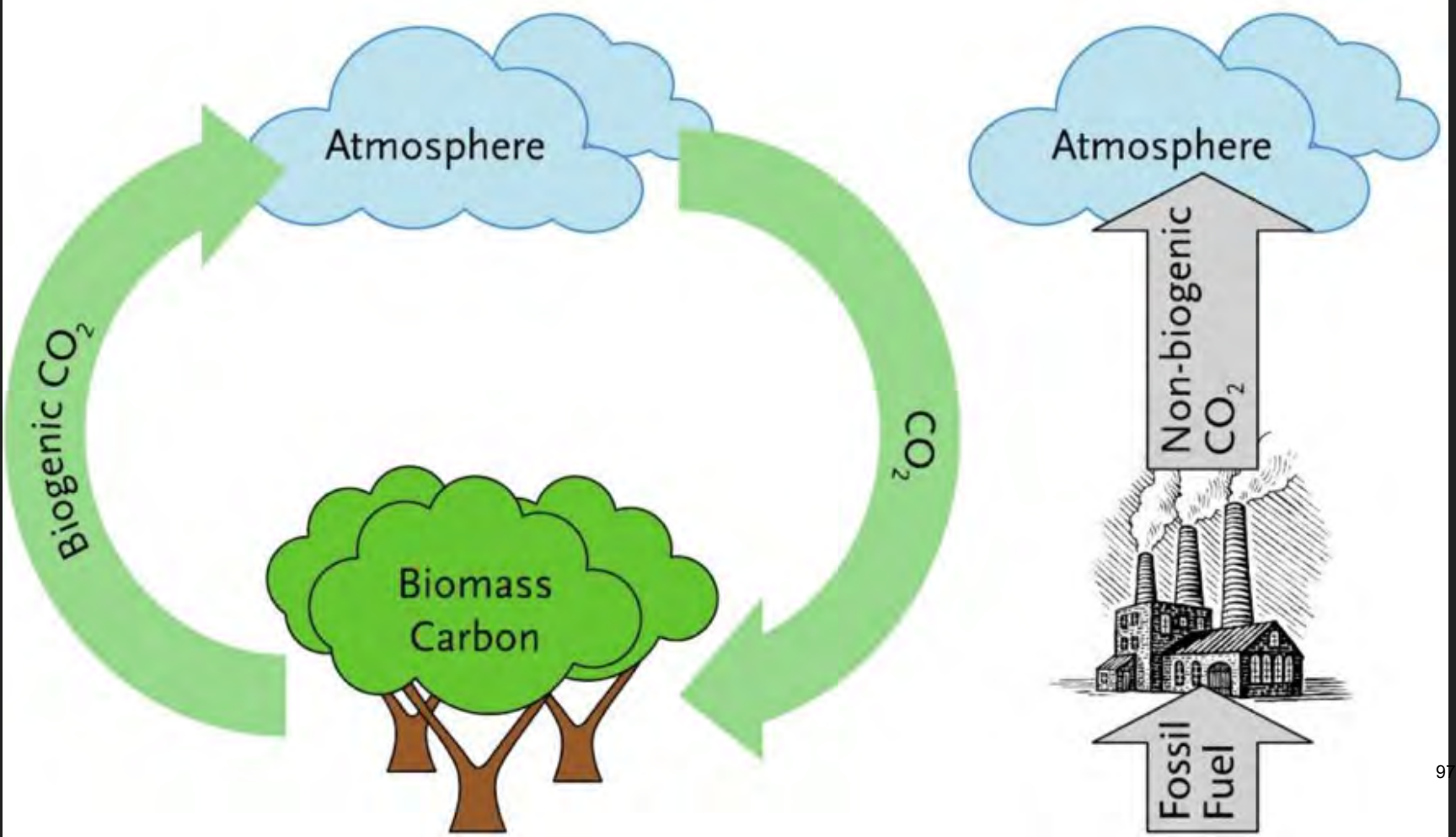
Emits air pollution

Expensive

Is biomass power “Carbon Neutral”?



Extraction of billions of tons per year of non-circulating fossil carbon have been added to the carbon cycle. This is the primary driver of human-caused climate change.

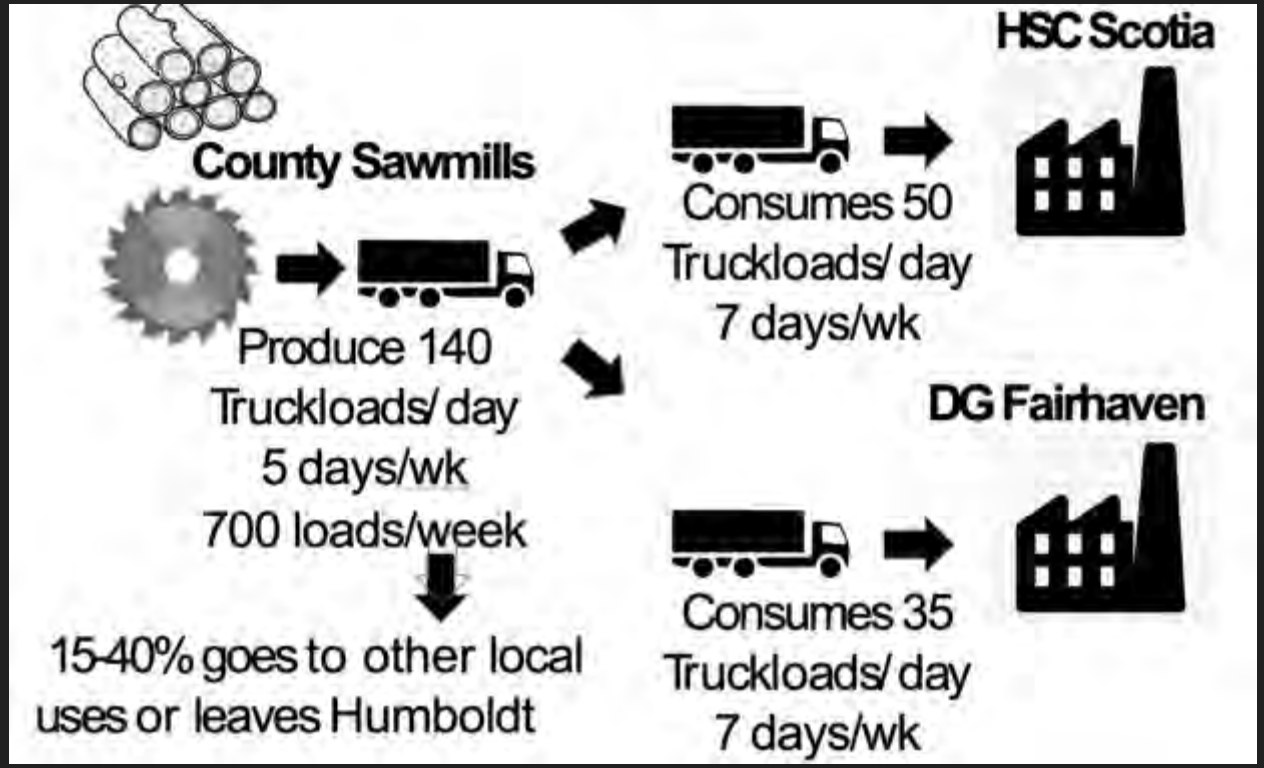

Atmosphere
Biogenic CO_2
CO_2
Biomass
Carbon
Atmosphere
Non-biogenic
CO_2
Fossil
Fuel

What about air pollution?

Emissions x Exposure

HRC Plant in Scotia

Abundant local mill residues



What used to be done with this material?

What to do with the excess mill residue?

Fuel products

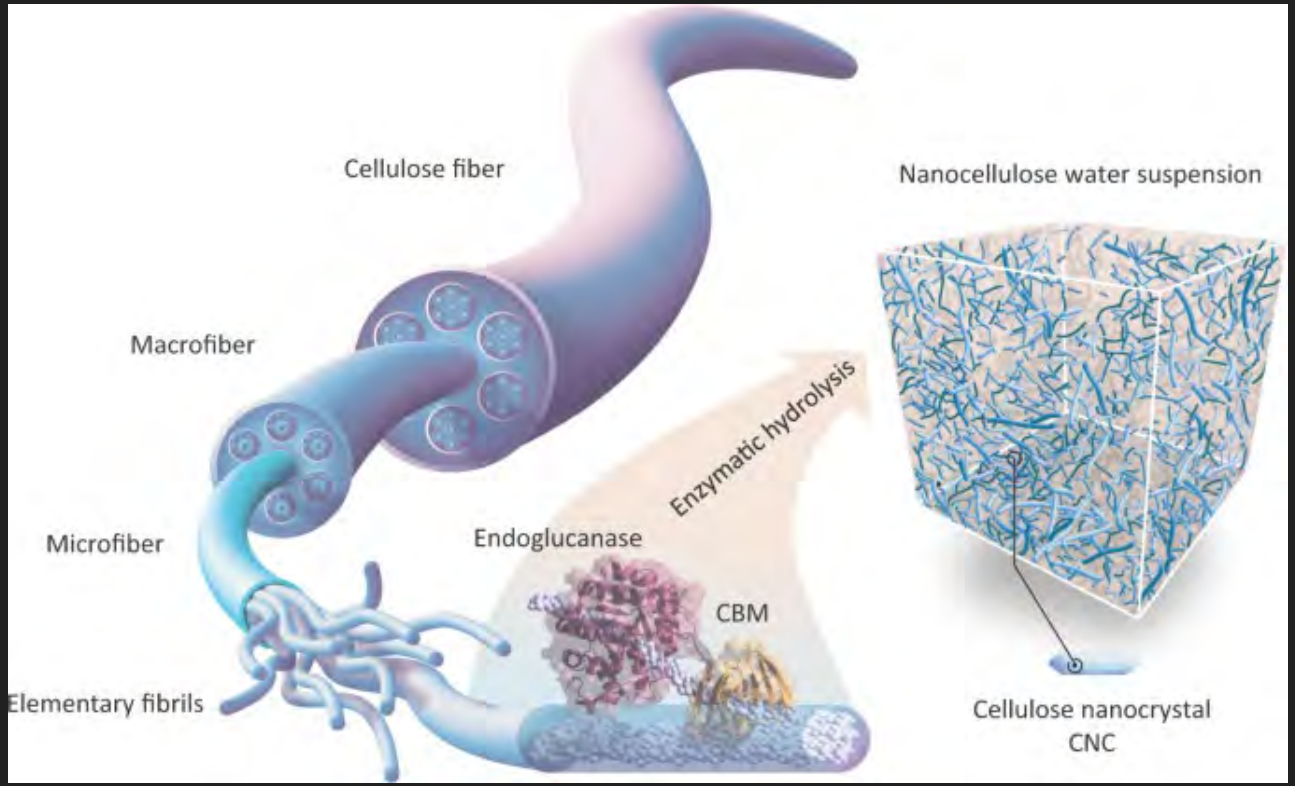
- (Still get GHG emissions,
  but usually substitutes for fossil fuels)

Carbon sequestering solutions

- Compost (very limited quantities)
- Biochar (promising, and markets exist)
- Nano Cellulose (super promising)

Biochar

Nano Cellulose



Nano Cellulose

Head of a pin is one million nanometers wide, cellulosic nanocrystals are 6 nanometers wide. Polymerized to form myriad compounds.

- As strong as steel, only 1/5th the weight

Can be made from wood chips, mill residues

- **Better concrete, Biodegradable plastics substitute, packaging, coatings, automotive components, paints, paper and paperboard, polymer composites, medical applications, electronics, aircraft components and many more**

From: Michael Goergen, Endowment for Forests and Communities

Summary

1. Biomass power has plusses and minuses
2. Is it “carbon neutral”?

   Yes and No

1. Alternatives and opportunities

Biomass Power Generation

+ Advantages

Dispatchable power

Substitutes for fossil sources

In the carbon cycle

Uses excess mill residues

Regarded as a climate solution

– Disadvantages

Emits greenhouse gasses and black carbon

Emits air pollution

Expensive

The Future of RCEA's Use of Biomass Power

Adaptive management planning is always a sound strategy. Scenario-based planning can accommodate the uncertainties of future energy supplies, technology, climate policy, and economics.

Several considerations are paramount:

The future holds some crucial unknowns and unknowables: Technology developments, availability, and price of energy sources, business considerations, electric grid upgrades, markets for various mill residues, climate policies for mitigation including sequestration incentives (such as offsets for sequestering mill residues), and future air quality regulations, to name a few.

Biomass power plants need some assurance of being able to sell power to justify upgrades to increase efficiency and reduce air pollutants. These upgrades are expensive and often involve shutdowns for installation.

Scenarios can be created to evaluate potential futures and inform future decisions. For example, scenarios could be built for solar and wind power availability and prices into the future, increased grid flexibility for dispatchable power, and how these compare to a likely fixed price of biomass power. If prices, availability, and dispatchability cross a threshold, biomass power might be abandoned in one scenario and continued in another.

It is reasonable to expect that the cost to produce biomass power will fluctuate with fossil fuel prices, but not otherwise change much in the next decade, while the costs of wind and solar are likely to continue to decline sharply. At what point is the differential determinative as to continuing to use biomass power? Future decisions to use biomass for power might turn on economics and the need for baseline power.

Leveraging Incentives for Better Air Pollution Control Technologies

Ideally, the biomass plants would use the Best Available Control Technology (BACT) to limit air pollution effects. This is not currently the case as the plants were built and permitted long ago. Implementing state-of-the-art control of air pollution is a reasonable goal for any power purchased by RCEA, as the emissions are directly connected to the purchases, and public health is an agency responsibility. RCEA could considering adding financial incentives and contract language to provide air quality protection beyond what the state requires, and be able to cancel contracts if emissions performance is substandard.

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Gathered research materials (not an RCEA site): https://sites.google.com/view/biomass-info/home

Consultations and Expert Panelists

September 13th expert panel

Mark Andre, City of Arcata

Richard Engel, RCEA

Kevin Fingerman, HSU Environmental Science

Colin Fiske, 350 Humboldt

Carrise Geronimo, Schatz Energy Research Center

Katy Gurin, 350 Humboldt

Julia Levin, Bioenergy Association of California

Melanie McCavour, Hunboldt State University, Dept. of Environmental Science & Management. Humboldt County Planning Commission

Matthew Marshall, RCEA

Timothy Metz, Restoration Forestry, Inc.

Bob Moreno, DG Fairhaven Power, LLC

Michael Richardson, Humboldt Sawmill Company

Wendy Ring, Independent physician

Adam Steinbuck, Humboldt Redwood Company

Andrea Tuttle, Freelance forest carbon expert

Yana Valachovic, UC Cooperative Extension

Michael Winkler, City Council of Arcata, RCEA Board of Directors

Sheri Woo, HBMWD, RCEA Board of Directors

October 18th panel

Richard Engel, RCEA

Kevin Fingerman, HSU

Angie Lottes, California Department of Forestry and Fire Protection

Wendy Ring, Freelance physician

Adam Steinbuck , HRC Scotia

Yana Valachovic, UC Extension

Jason Wilson, NCUAQMD

Michael Furniss, Consultant to RCEA - Moderator

Individual Consultations

Juliet Bohn, Clean Energy, and Waste Utilization Strategist, Juliette P. Bohn Consulting

Jason Davis, Deputy Air Pollution Control Officer, North Coast Unified Air Quality Management District

Richard Engel, Director, Power Resources, Redwood Coast Energy Authority

Kevin Fingerman, Assistant Professor, Energy & the Environment, HSU

Jana Ganion, Director of Sustainability and Government Affairs, Blue Lake Rancheria

Larry Goldberg, Vice Chair RCEA CAC and 350 Humboldt Steering Committee

Katy Gurin, Hydraulic Engineer, AECOM

Arne Jacobson. Director of the Schatz Energy Research Center (SERC) and Professor of Environmental Resources Engineering Professor, Humboldt State University

Angie Lottes, Assistant Deputy Director for Climate & Energy, California Department of Forestry and Fire Protection

Matthew Marshall, Executive Director, RCEA

Melanie McCavour, Humboldt State University, Dept. of Environmental Science & Management. Humboldt County Planning Commissioner

Bob Moreno, Manager, DG Fairhaven Power, LLC

Wendy Ring, Physician, Climate/Health activist, producer of Cool Solutions Radio Show

Gary Rynearson, Manager, Forest Policy and Sustainability. Green Diamond Resource Company

Adam Steinbuck, Director, Fiber and Freight, Humboldt Redwoods Company, LLC

Nancy Stephenson, Community Strategies Manager, RCEA

Andrea Tuttle, former Director of the California Dept. of Forestry and Fire Protection (CDF). Freelance forest carbon expert

Yana Valachovic, County Director and Forest Advisor, Humboldt County UC Extension

Tom Wheeler, Executive Director, Environmental Protection Information Center

Brian Wilson, Air Pollution Control Officer, North Coast Unified Air Quality Management District

Michael Winkler, Mayor, City of Arcata, RCEA Board of Directors

Sheri Woo, Environmental Engineer, SHN Consulting Engineers and Geologists. Humboldt Municipal Water District Board of Directors, RCEA Board of Directors

Alternative Uses of Biomass Material in Humboldt County

Preliminary Report to the RCEA Board of Directors
from the Community Advisory Committee
March 2021

At its October 2020 meeting, the RCEA Community Advisory Committee (CAC) formed an ad hoc subcommittee to consider alternative uses of local biomass material, including both local mill wastes and in-woods slash and thinning material.

The subcommittee includes CAC members Katy Gurin, Dennis Leonardi, Kit Mann, Jerome Carman, and Luna Latimer, with support from staff members Richard Engel and Lori Taketa and RCEA consultant Michael Furniss. The subcommittee held its first meetings on November 3, December 4, and January 8.

RCEA is an energy agency whose stated purpose is "to develop and implement sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient and renewable resources available in the region." Because RCEA is now a partner with the County of Humboldt in developing a regionwide climate action plan, the subcommittee agrees that RCEA should also appropriately assess energy and non-energy uses of biomass that provide climate change solutions. The subcommittee also agrees it may be appropriate for RCEA to facilitate third-party actions that can advance alternative biomass uses.

The subcommittee agrees to the following scope:

- The immediate issue relevant to RCEA is management of the mill waste that primarily fuels the one operating local biomass plant. The subcommittee is also interested in uses for in-forest materials that are being managed for fuel reduction and forest health, particularly in the primarily important Wildland-Urban Interface (WUI), but some members believe that these materials should be considered beyond RCEA's scope. The CAC is particularly interested in the Board's view on this.
- RCEA will consider both energy and non-energy alternative uses of biomass material.
- Recommendations for specific measures will specify whether the recommendation is in the context of continuation, reduction, or expansion of biomass electric power production.
- The subcommittee does not propose to provide guidance on management decisions about RCEA's current biomass power procurement; the group limits its scope to reviewing and recommending alternative uses of the material currently used as feedstock at biomass power plants and in-woods slash disposal. Staff and consultants will provide decision support for related decisions about power procurement.

The subcommittee endorses the following problem statement regarding biomass alternatives:

- Since the launch of RCEA's community choice energy program, which includes a local biomass power component, the Board has heard community concerns and expert panels about air quality impacts of biomass power production using the existing plants; concerns about whether biomass power should be considered an effective climate solution; and concerns from the forestry community and forest products industry about the need for feasible waste disposal.
- Of the County's existing three biomass plants, only one currently remains operational. Industry-wide in the USA, biomass power is in decline due to other forms of renewable energy, including wind and solar, becoming available at lower costs.
- Biomass-generated power substitutes for burning natural gas in our service area and this can be considered a climate benefit, but compared with natural gas, produces more emissions per unit of power generated and much more particulate air pollution than natural gas.
- With declining use of biomass power, the local forest products industry is faced with the problem of how to dispose of mill waste (100+ truckloads per day in the peak logging and lumber manufacture season and market periods). In addition, Humboldt County, like much of northern California, faces elevated wildfire risk associated with nearly ubiquitous densification of forests resulting from a century of aggressive and effective fire suppression. Transporting remote and dispersed in-woods fuels for energy production or alternative uses remains prohibitively expensive in most situations.

Several alternative uses of local biomass have been assessed. In spring 2020, a class of graduating engineering seniors at HSU did an analysis of potential uses of local mill wastes, broadly falling into three categories:

- Energy uses – torrefaction, gasification, pyrolysis, ethanol, wood pellets
- Manufactured goods – oriented strand board, tissue, particle board, bioplastics (nano-cellulose products were not considered).
- Agricultural use – biochar, compost, mulch, animal bedding

The students' slide decks are available on RCEA's website: https://redwoodenergy.org/community-choice-energy/about-community-choice/power-sources/humboldt-county-biomass/ (see "Humboldt State University Capstone Class on Alternative Biomass Uses").[1]

[1] The student research is of special value in that it was performed specifically for RCEA in reference to the local mill waste problem. Mr. Furniss has gathered additional information resources on biomass power and alternative uses of biomass in his report, included as a separate attachment to this month's biomass staff report to the Board.

Given RCEA's principal mission[2], staff are interested in the energy-producing uses examined by the students. However, recent economic analysis by the California Energy Commission and other entities has generally shown these technologies are not cost-competitive with other renewable resources such as wind and solar, even when those intermittent resources are coupled with energy storage to address reliability needs.[3]

Having examined the various alternatives proposed by the student teams and the literature, RCEA consultant Michael Furniss notes that there is an opportunity for significant local carbon sequestration in managing waste biomass (~400,000 metric tons of CO_2 equivalent per year), via carbon-sequestering non-energy uses such as nanocellulose products, compost, and biochar.

The CAC's biomass subcommittee requests guidance from the Board on a continuing role for the subcommittee.

- Does the Board wish to have this subcommittee continue to operate in an advisory role on biomass alternatives?
- To what degree does the Board wish RCEA to lead and collaborate on advocating, researching, testing, and implementing alternative uses of the local biomass derived from mill waste that currently makes up most of the feedstock used for local biomass power?
- To what degree does the Board wish RCEA to become involved in seeking alternative uses for other biomass materials, including in-forest slash from logging operations and fuels treatment?
- Would RCEA consider funding a Life Cycle Analysis, including alternative uses, for local mill waste?
- Does the Board wish to move forward to pursue grant funding for biochar, nanocellulose, and/or compost demonstration projects? Would the Board support RCEA contributing required match funding for such grants?
- Are there other specific questions the Board would like the subcommittee and staff to consider?

[2] RCEA's policy on Biomass is reflected in this document: RePower Humboldt The Redwood Coast Energy Authority's Comprehensive Action Plan for Energy https://redwoodenergy.org/wp-content/uploads/2020/06/RePower-2019-Update-FINAL-.pdf.
[3] California Energy Commission. "Estimated Cost of New Utility-Scale Generation in California: 2018 Update" (see Figure 7) https://ww2.energy.ca.gov/2019publications/CEC-200-2019-005/CEC-200-2019-005.pdf.

REDWOOD COAST EnergyAuthority

STAFF REPORT
Agenda Item # 8.2

AGENDA DATE:	March 25, 2021
TO:	Board of Directors
PREPARED BY:	Matthew Marshall, Executive Director
SUBJECT:	Board Meeting Duration and Frequency Adjustments

SUMMARY

Since the launch of RCEA's Community Choice Energy program staff have noted competing needs of addressing a growing number of Board action items, respecting directors' limited availability, and the need to deliver background information to facilitate effective Board member decision-making. More recently, pandemic-driven virtual Board meetings require directors to consider complex and technical topics in extended online sessions, often after workdays spent online.

Staff have received feedback that discussing complex issues toward the end of long meetings is challenging. At the same time, accelerating climate change-related events and response necessitate increased education for new and incumbent directors on California's changing energy procurement and regulatory environment.

Based on input from the Board Chair and Vice Chair, staff proposes the addition of a quarterly special meeting focused on information-only agenda items such as:

- general RCEA power procurement updates,
- the quarterly energy risk management report,
- legislative and regulatory updates,
- strategic plan updates, and
- background information to inform upcoming Board decisions (e.g. this meeting's biomass analysis report).

Regular monthly meetings could focus on action items with brief staff reports. While these study session-style special meetings would not involve decision making, a quorum of directors (five) would still be required to meet.

Possible meeting times for these quarterly study sessions include:

- An evening session after a break following a regularly scheduled Board meeting;
- The hour before a regularly scheduled Board meeting; or
- On a day other than the regular Board meeting date (see jurisdiction meeting calendar).

RECOMMENDED ACTION

Staff requests that the directors discuss their preferences and vote to call quarterly special meetings, if desired. The Chair may also call a special meeting quarterly as needed.

Agency Meetings & Potential RCEA Study Session Dates

Week #	Monday	Tuesday	Wednesday	Thursday	Friday
1	10 a.m. - HTA (1:30 p.m. – County special mtgs) 6 p.m. – Fortuna CC	9 a.m. – County BoS 5 p.m. – Eureka CC 6:30 p.m. – Rio Dell	(10:30 a.m. – A1AA, every other month) Afternoon 6 p.m. - Arcata CC	Any time all day or evening	Any time during business hours
2	Any time until noon (1:30 p.m. – County special mtgs) (4:30 p.m. –Hazmat Response, quarterly)	9 a.m. – County BoS 6 p.m. – Trinidad CC	Any time all day or evening	9 a.m. – HBMWD Board 5:30 p.m. - HWMA	Any time during business hours
3	Any time until noon (1:30 p.m. – County special mtgs) 6 p.m. – Fortuna CC	9 a.m. – County BoS 5 p.m. – Eureka CC 6:30 p.m. – Rio Dell	(9 a.m. – LAFCO, every other month) Afternoon 6 p.m. - Arcata CC 7 p.m. – Ferndale CC	Any time until 3 p.m. 4 p.m. – HCAOG	Any time during business hours
4	Any time until noon (1:30 p.m. – County special mtgs) 6:30 p.m. - RREDC	9 a.m. – County BoS 7:30 p.m. – Blue Lake	Any time until 5 p.m. 6 p.m. – Trinidad CC	2:30 p.m. 3:30 p.m. – RCEA Evening after meeting	Any time during business hours

Potential RCEA Board study session times