

**Redwood Coast Airport Renewable Energy Microgrid
Memorandum of Understanding**

among
County of Humboldt,
Redwood Coast Energy Authority
and
the Humboldt State University Sponsored Programs Foundation /
Schatz Energy Research Center

This Memorandum of Understanding (“MOU”) sets forth the terms and understanding between the County of Humboldt (“County”), the Redwood Coast Energy Authority (“RCEA”), and the Humboldt State University Sponsored Programs Foundation/Schatz Energy Research Center (“HSUSPF/SERC”), from here on referred to as the Parties to this MOU (“Parties”), concerning the Redwood Coast Airport Renewable Energy Microgrid (“Microgrid”). The Parties intend to develop, design, install and operate the Microgrid at the California Redwood Coast - Humboldt County Airport (“Airport”).

1. Background

The following facts describe and form the rationale for the Microgrid project:

- The Airport and adjacent Coast Guard Sector Humboldt Bay Air Station provide critical disaster relief services to Humboldt County and surrounding region.
- Availability of electrical power for these facilities is critical to the provision of emergency services.
- The Microgrid is a solar-based system that will provide local, renewably generated electrical power for extended periods without the need for operation of the larger electrical grid and without the need for fuel deliveries, thus ensuring the Airport can operate during emergencies.
- The HSUSPF/SERC has received a \$5M grant from the California Energy Commission (“CEC”) to design, install, operate, monitor and evaluate the performance of the Microgrid at the Airport.
- The Microgrid’s primary electrical circuit will be owned by the Pacific Gas & Electric Company (“PG&E”) and will be located at the end of their Janes Creek 1103 distribution circuit.
- The proposed Microgrid will include the installation of a ~2 MW solar electric array coupled with a ~2 MW/8 MWh battery storage system for wholesale market participation, a ~300 kW solar electric array for net metered service, and four electric vehicle charging stations.¹
- The County is seeking ways to generate additional revenue and/or reduce operating costs at the Airport; it is expected that the Microgrid will generate an average of approximately 430 MWh/yr, which will offset the Airport’s energy usage.²

¹ Equipment capacities are approximate based on the preliminary system design and are subject to change.

² Approximate energy savings, greenhouse gas emission savings and project costs are stated throughout this MOU. These estimates are based on the stated approximate system capacities and other assumptions. Actual savings and costs may vary.

- Solar electric arrays are incorporated into the Airport Layout Plan which has received conditional approval from the Federal Aviation Administration (“FAA”).
- The County is seeking ways to improve the marketing image of the Airport. The Microgrid project will serve this purpose by installing solar power to “green” the Airport and adding resiliency benefits by installing microgrid technology.
- The RCEA has established a Community Choice Energy (“CCE”) program that provides the generation component of electricity service to 93% of eligible electricity customers in Humboldt County.
- RCEA, as part of the CCE program, has goals to develop local renewable power resources, is required to meet requirements of the State of California’s Renewable Portfolio Standard, and is required to provide energy storage $\geq 1\%$ of the peak load for RCEA customers. RCEA aims to develop local renewable power sources as a way to improve regional energy security, create local jobs, keep energy dollars flowing in the local economy, and lessen the climate change impacts of our energy use.
- RCEA is procuring a \$6M loan from the United States Department of Agriculture’s Rural Utilities Service to provide cost share to implement the project.
- By leading the Microgrid project, the HSUSPF/SERC furthers its mission to promote the use of clean and renewable energy and furthers its efforts to move Humboldt County toward a more energy secure future.
- The HSUSPF/SERC has demonstrated expertise and competence to carry out a project such as the Microgrid by recently completing the award-winning Blue Lake Rancheria Renewable Energy Microgrid Project.
- The HSUSPF/SERC has assembled an expert team to carry out the Microgrid project, including the substantial involvement of PG&E, the utility responsible for local electricity grid infrastructure.
- The RCEA is a local government Joint Powers Authority, comprised of the County of Humboldt; Cities of Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell, and Trinidad; and the Humboldt Bay Municipal Water District. RCEA administers CCE program in Humboldt County for the benefit of its customers. Power from the 2 MW solar electric array and coupled battery storage system will be utilized to serve RCEA CCE customers. RCEA will sell dispatchable renewable electricity from the Microgrid on the wholesale power market and financial gain realized from this market participation will benefit all CCE customers, including the County of Humboldt.
- The estimated operating life of the Microgrid is 25 years; it is assumed that the salvage value will be sufficient to pay for decommissioning and removal.
- At the present time, there is no foreseeable aeronautical use planned for the land area proposed for the Microgrid project and the County considers the Microgrid project to be a vital non-aeronautical land use at the Airport.
- The Microgrid project will generate Renewable Energy Certificates (RECs) through registration in the Western Renewable Energy Generation Information System (WREGIS).
- The RECs generated by the 300 kW solar system will accrue to the County.
- The RECs generated by the 2 MW solar plus battery system will accrue to RCEA.

Because of these facts, the Parties agree to work collaboratively to complete the Microgrid project for their mutual benefit and for the benefit of the residents of Humboldt County.

2. Purpose

The purpose of this MOU is to describe how the roles and responsibilities are allocated and how the costs and benefits associated with the Microgrid project are shared among the Parties. The intention is to establish a clear framework for the Parties that leads to successful execution of the Microgrid project. This MOU embodies the understanding among the Parties for the project development period (as described in Section 7 below) and will be supplemented by subsequent agreement(s) such as, for example, a Lease and/or an Operational Agreement.

3. Division of Responsibilities

This section describes the Microgrid project responsibilities assigned to each of the Parties.

County of Humboldt Responsibilities:

- Prepare an Initial Study and subsequent Mitigated Negative Declaration for compliance with the California Environmental Quality Act³
- Work with HSUSPF/SERC to obtain project approval from the FAA
- Prepare an Environmental Assessment as required by the FAA for compliance with the National Environmental Policy Act
- Provide the land necessary for the RCEA owned solar electric and energy storage assets (County and RCEA will negotiate and enter into a Land Lease Agreement)
- Host the four electric vehicle charging stations in the short term parking lot at the airport (see preliminary EV Charging Site Plan, Attachment 2, and EV Charging Station MOU, Attachment 3)
- Review preliminary EV charging station site plan for compliance with ADA requirements for EV charging station installations
- With advance notice, allow access to the Microgrid project site to RCEA and HSUSPF/SERC personnel and subcontractors for project development purposes.
- Provide readily available data such as geotechnical reports, topographical survey data, electricity consumption data, as-built engineering plans for onsite electrical and water systems for Microgrid project development purposes
- Participate in construction sequencing, commissioning, and onsite test planning to ensure that airport security standards are maintained during construction and that planned power outages are scheduled for times when impacts can be minimized
- Serve as primary point of contact for all communication with FAA, and negotiate on behalf of Parties regarding FAA regulatory requirements, mandates, emergencies, and other matters that directly or indirectly impact the installation, operation, and maintenance of the Microgrid
- Obtain bids for removing designated trees that border the Microgrid project site along Airport Road

³ This was required by the California Energy Commission before funding this project. This task was completed when the Notice of Determination was recorded May 8, 2018.

- Work with HSUSPF/SERC, RCEA, and PG&E to set up the aggregated net energy metering account that will allow the County to benefit from the 300 kW solar array that will be owned and operated by RCEA on the County's behalf
- Work with HSUSPF/SERC and RCEA to establish a new water service in RCEA's name to provide water to the Microgrid project site for panel washing, site management, or similar Microgrid operation and maintenance activities, if HSUSPF/SERC determines that the project budget supports the estimated construction cost of a new water service. If a new water service is not installed, RCEA will truck water in to the site as needed for maintenance activities.
- Agree to negotiate in good faith with RCEA to determine the fate of and financial impacts of decommissioning the Microgrid project before its 25-year operating life has elapsed, in the event that the County determines that the project site is needed for an aeronautical use. This will occur if decommissioning is required by the FAA and only as a last resort and after other options are explored.
- Shall have no financial responsibility for the removal and/or modification of the Microgrid after the 25-year operating life has elapsed.
- Provide necessary documents to authorize RCEA to submit the necessary interconnection applications Pacific Gas & Electric (PG&E) for interconnecting the generation resources. The applicant to PG&E will be RCEA and there will be no cost to the County

RCEA Responsibilities:

- Submit the necessary interconnection applications Pacific Gas & Electric (PG&E) for interconnecting the generation resources. The applicant to PG&E will be RCEA and there will be no cost to the County.
- Purchase and install the solar electric systems, including a 2 MW PV array for wholesale market participation and a 300 kW PV array for net metered service¹
- Purchase and install a battery energy storage system (approximately 2 MW and 8 MWh)¹
- Purchase and install a microgrid protection and control system, most of which will be deeded to PG&E when the project becomes operational
- Purchase and install four electric vehicle charging stations in the short term parking lot at the airport (see preliminary EV Charging Site Plan, Attachment 2), and EV Charging Station MOU, Attachment 3)
- Work with HSUSPF/SERC to establish a new water service to provide water to the Microgrid project site for panel washing and site management, or similar Microgrid operation and maintenance activities, if HSUSPF/SERC determines that the project budget supports the estimated construction cost of a new water service. If a new water service is not installed, RCEA will truck water in to the site as needed for maintenance activities.
- Own, operate, and maintain the above listed assets and maintain the grounds of the project site for 25 years
- Mitigate the effect of the photovoltaic array with the FAA, if glint or glare from the solar panels is later found to have an impact on the air traffic controllers/tower and/or air navigation.
- Decommission the above listed assets at the end of the 25-year project period

- Operate the 300 kW solar array when the PG&E grid is energized so that all electricity produced will be credited to County electrical accounts at the airport
- Provide assurance to the County that the PV NEM array will deliver no less than 350,000 kWh/yr in any year to the airport facility meter to be installed for the generating account as part of the planned aggregated NEM service. The projected average annual output from the PV NEM array is 428,000 kWh/yr, with year-to-year variations in output due to weather conditions and solar panel degradation.
- Provide an annual energy generation report and financially compensate the County for energy shortfalls below the minimum specified amount (350,000 kWh) within 60 calendar days of the end of the true-up period, calculated as the average electrical price of the rate for the year in question times the generating shortfall below 350,000 kWh. The true-up period will be a one-year period marking the anniversary of the system's interconnection. The average rate will be calculated by dividing all per-kWh electrical generation, transmission, and distribution charges for the aggregated benefitting accounts during the year in question by the total billed kWh consumption for these accounts. This assurance is subject to terms and conditions within the pending lease agreement between the County and RCEA, including force majeure and other factors that may affect total energy delivered.
- Operate the 2 MW solar array and the battery when the PG&E grid is energized so that the electricity produced is exported through trading in the California Independent System Operator ("CAISO") markets and to the benefit local CCE customers
- Operate the Microgrid in the event of a power outage on the PG&E distribution feeder serving the Airport to maintain backup power for the Airport and Coast Guard for as long as possible within acceptable operating specifications for all Microgrid equipment
- Reconnect the Microgrid to the main PG&E grid after the PG&E grid has been restored following a power outage affecting the microgrid
- Agree to negotiate in good faith with the County to determine the fate of and financial impacts of decommissioning the Microgrid project in the event that the County determines that the project site is needed for an aeronautical use before its 25-year operating life has elapsed

HSUSPF/SERC Responsibilities:

- Execute the prime contract (EPC-17-055) with the CEC, taking responsibility to facilitate delivery of the project as per the intent of the contract Scope of Work (See grant Scope of Work, Attachment 4)⁴
- Serve as owner's engineer for the RCEA to facilitate and manage system design, testing, construction, interconnection, documentation, and commissioning
- Serve as technology and system integrator including facilitating necessary approvals for interconnection to the PG&E distribution grid and participation in CAISO wholesale energy markets
- Manage the overall project, including the participation of all subcontractors and project partners
- Support the County in obtaining FAA approval to construct the Microgrid project

⁴ EPC-17-005 was fully executed on 8/8/2018.

- Coordinate the design and testing of the microgrid controls to meet PG&E requirements
- Design, bid, and oversee construction of the EV charging stations to be installed in the short-term parking lot at the airport
- Design, bid, and oversee construction of a new water service to serve the RCEA and provide water to the Microgrid project site for panel washing and site management, if HSUSPF/SERC determines that the project budget supports the estimated construction cost of a new water service. If a new water service is not installed, RCEA will truck water in to the site as needed for maintenance activities.
- Design, bid, and oversee construction of the balance of systems between the battery energy storage system and the microgrid circuit, including the physical infrastructure to support the microgrid controls

4. Distribution of Costs and Benefits

Table 1 outlines how the costs and benefits associated with the Microgrid project are distributed among the Parties. Table 2 outlines how the costs and energy benefits associated with the 300 kW PV array for net metered service are distributed among the Parties.

Table 1. Microgrid Project – Costs and Benefits for Total Project⁵

	Costs	Benefits
RCEA	<ul style="list-style-type: none"> ● Proposal/pre-award phase <ul style="list-style-type: none"> ○ Internal labor costs (\$20,000) ○ Technical assistance contract with HSUSPF/ SERC (\$20,000) ● Project labor costs (\$150,000) ● RCEA share of battery storage system (\$1,371,358) ● PV systems - 2.3 MW total (\$4,600,000) ● Electric vehicle charging system (\$25,000) ● EV charging operation and maintenance (\$5,700/yr) ● PV O&M (\$47,000/yr) ● Battery O&M (\$30,000) 	<ul style="list-style-type: none"> ● In the proposal phase of the project it was estimated that the wholesale power system could generate about \$250,000/yr in revenue.
County	<ul style="list-style-type: none"> ● CEQA Initial Study & Mitigated Negative Declaration (\$20,000) ● Environmental Assessment for NEPA (\$60,000) ● FAA approval process (\$15,000) 	<ul style="list-style-type: none"> ● Estimated production of an average of 430 MWh/yr of electricity by the 300 kW PV array, with a minimum of ~360 MWh/yr and a maximum of ~470 MWh/yr.
HSUSPF/ SERC	<ul style="list-style-type: none"> ● Proposal preparation (\$50,509) ● Indirect project costs counted as match for CEC grant (\$326,370) 	
Costs covered by CA Energy Commission Grant	<ul style="list-style-type: none"> ● Electricity distribution infrastructure (\$657,441) ● CEC share of battery storage system (\$960,607) ● Microgrid control system (\$596,805) ● Coordinated electrical house (\$454,197) ● Transformer (\$66,794) ● Balance of system materials & services (\$250,175) ● Electrical engineering services (\$99,592) ● Prime contractor labor (\$1,222,682) ● Additional subcontractors (\$219,749) ● Travel, indirect, misc. (\$471,958) 	

⁵ The majority of stated costs and benefits are best estimates at the outset of the project; actual costs and benefits will vary. Costs specified to a high level of significant figures were specifically stated as such in the CEC contract, but are still subject to change.

Table 2. Microgrid Project – Costs and Benefits for 300 kW PV array⁴

	Costs	Benefits
RCEA	<ul style="list-style-type: none"> ● PV system– 300 kW NEM array (Approximately \$600,000) ● PV O&M (\$6,640/yr for 25 years) 	<ul style="list-style-type: none"> ● Land lease of 9 acres for the combined PV system (2.3 MW total), valued at about \$3,400/yr based on the Bureau of Land Management Instruction Memorandum No. 2017-096
County	<ul style="list-style-type: none"> ● CEQA Initial Study & Mitigated Negative Declaration (\$20,000) ● Environmental Assessment for NEPA (\$60,000) ● FAA approval process (\$15,000) 	<ul style="list-style-type: none"> ● Estimated production of an average of 430 MWh/yr of electricity by the 300 kW PV array, with a minimum of ~360 MWh/yr and a maximum of ~470 MWh/yr.

5. Additional Benefits

There are significant benefits to the County and the Airport that are difficult to quantify in simple direct monetary terms. These include the following:⁴

- Added resilience for the Airport and Coast Guard Air Station. These facilities will have a more secure supply of electrical power that does not rely on outside sources of energy or fuel. This is particularly important in times of a natural disaster when Humboldt County could be isolated for weeks from the outside world and the only method to get supplies in and out of the County would be via aircraft. In addition, aircraft would be critical to distributing supplies around the County and could result in saving lives.
- Added resiliency and reliability in the electrical power will also buffer against short-term outages. It is not uncommon for power outages to occur during winter storms, and utilities may shut off parts of the grid due to extreme fire danger. The estimated value of these short-term resiliency benefits is \$52,000 per year. A task under the Microgrid project is to further refine this estimate and this data will be shared when the results are available.
- The Airport will offset approximately 130 metric tons of CO₂ per year as a result of the electricity provided by the 300 kW solar array, helping to achieve regional greenhouse gas reduction targets.
- Helping to mitigate climate change is an important benefit, especially in a coastal community that will be adversely affected by sea level rise.
- Adding electric vehicle charging at the airport will serve to attract customers, will improve the service level that customers receive, and will decrease the airport’s environmental footprint. It may also accelerate and support a business case to electrify airport ground support equipment.
- Conservative estimates of job creation benefits indicate that implementing the Microgrid project will result in an estimated 37 FTE during the construction phase with \$1.5M in earnings and \$3.4M in economic output. Approximately 0.2 FTE jobs per year will be supported during sustained operations with \$10,000 per year in earnings and \$14,600 per year in economic output.

6. Funding

The responsibilities between the Parties for covering various costs associated with this project are articulated in Section 4. If significant additional and unforeseen costs arise (for example tree removal and accessibility improvements) during the term of this MOU, the Parties agree to negotiate in good faith to decide how the costs will be covered. Section 8 of this MOU will be used to modify the MOU in such cases.

7. Duration/Timeframe

This MOU represents the Parties' current understanding of their respective responsibilities in developing, operating and maintaining the Microgrid project and may be revised by mutual consent of authorized officials from the Parties, including through the adoption of implementing agreements between any of the Parties. This MOU shall become effective upon signature by authorized officials from all three the Parties and will remain in effect until modified or terminated by the Parties by mutual consent. In the absence of mutual agreement by the authorized officials from the Parties, this MOU shall terminate at the end of the CEC grant period on March 31, 2023. Following the end of the CEC grant period, additional agreements may continue to dictate roles and responsibilities associated with the Microgrid project (e.g., the land lease between the County and RCEA).

8. Amendments

This MOU may be amended by mutual agreement among the Parties to address circumstances that cause or may cause unforeseen impacts to any Party, or as otherwise deemed necessary by the Parties.

9. Notices

Any and all notices required to be given pursuant to the terms of this MOU shall be in writing and either served personally or sent by certified mail, return receipt requested, to the respective addresses set forth in Section 10. Notice shall be effective upon actual receipt or refusal as shown on the receipt obtained pursuant to the foregoing.

10. Signatories

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