

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In The Matter of the Application of)
)
HAWAIIAN ELECTRIC COMPANY, INC.,)
HAWAII ELECTRIC LIGHT COMPANY, INC.)
MAUI ELECTRIC COMPANY, LIMITED)
)
For Approval to Establish a Rule to Implement)
a Community-Based Renewable Energy Program,)
and Other Related Matters.)
_____)

DOCKET NO. 2015-0389

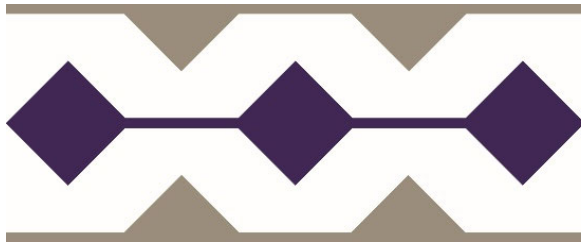
**THE HAWAIIAN ELECTRIC COMPANIES’
COMMUNITY BASED RENEWABLE ENERGY PHASE 2 TARIFF AND
APPENDICES, AND RFPS AND MODEL CONTRACTS FOR
LMI SUBSCRIBERS, TRANCHE 1, MOLOKAI AND LANAI**

Book 3 of 6

Filed March 30, 2021

EXHIBIT 7

Draft RFP for CBRE Projects for Molokai



**Maui
Electric**

DRAFT

REQUEST FOR PROPOSALS

FOR

COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

This Request for Proposals (“RFP”) is a DRAFT only. Maui Electric Company, Ltd. (“Maui Electric” or “Company”) will employ a competitive bidding process to select renewable energy projects including Community Based Renewable Energy consistent with the State of Hawai‘i Public Utilities Commission’s (“PUC”) Competitive Bidding Framework. Under the Competitive Bidding Framework, Maui Electric filed the initial draft RFP with the PUC. The proposed final RFP is being submitted to the PUC for approval and is subject to further revision based upon direction received from the PUC. After approval by the PUC, Maui Electric will issue the final RFP.

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Chapter 1: Introduction and General Information

Maui Electric Company, Ltd. (“Maui Electric” or the “Company”) seeks proposals for Community-Based Renewable Energy (“CBRE”) projects, also referred to as shared solar¹, for the Maui Electric System on the island of Moloka’i in accordance with this Request for Proposals (“RFP”).

The Company or its Affiliates may submit a Proposal in response to this RFP subject to the requirements of this RFP.

In this RFP, the Company seeks new variable photovoltaic (“PV”) dispatchable generation projects (with a Battery Energy Storage System (“BESS”)) of at least 250 kW. The total amount of CBRE generation sought in this RFP is 2.75 MW. Mid-Tier Projects will utilize a pre-approved standard form contract in the form of Appendix K (“Mid-Tier SFC”). Each Mid-Tier Project will be limited to 250 kW at the distribution level and 1 MW or larger, up to and including 2.5 MW at the Pala’au Generating Station.

Each successful Proposer will provide PV generation and a BESS to the Company pursuant to the terms of a Mid-Tier SFC. Mid-Tier Projects selected in this RFP will not be subject to further PUC review and approval.

The Company’s Mid-Tier SFC employs an innovative contracting mechanism which is very different than traditional PPA structures. Proposers are instructed to thoroughly review the Mid-Tier SFC attached as Appendix K. The structure of the Mid-Tier SFC intends to provide payments to the Proposer by the Company on a monthly lump sum basis, based upon the energy potential of the facility, regardless of the actual energy dispatched. In exchange, the utility maintains full dispatch control of the Facility as needed. Under the Mid-Tier SFC, each Facility must meet certain requirements to receive the full lump sum payment each month. These requirements ensure that each plant is available to the Company for dispatch to meet system needs.

The Company will evaluate Proposals using the evaluation and selection process described in Chapter 4. The Company will evaluate and select Proposals based on both price and non-price factors that impact the Company, its customers, and communities affected by the proposed Projects. The number of Projects that the Company may acquire from this RFP depends on, among other things, the quality and cost-effectiveness of bids received in response to this RFP; economic comparison to other RFP responses; updates to the Company’s forecasts; distribution availability; and changes to regulatory or legal requirements. If attractive Proposals are received

¹ In response to some confusion in the community over the acronym “CBRE” that the Companies have experienced during their latest efforts to publicize the CBRE Program, the Companies are introducing the more descriptive term “shared solar” for the CBRE Program in an effort to alleviate any further confusion in the community. The Companies intent is to use both terms, “CBRE” in regulatory filings and “shared solar” in marketing and other Company literature to refer to the Community-Based Renewable Energy Program first introduced by the CBRE Framework. The term, “shared solar” will be used even though the CBRE Program is not necessarily limited to PV projects only.

that will provide energy and energy storage in excess of the targeted amounts, the Company will consider selecting such Proposal(s) if benefits to customers are demonstrated.

All requirements necessary to submit a Proposal(s) are stated in this RFP. A description of the technical requirements for Proposers is included in the body of this RFP, Appendix B, and in the Mid-Tier SFC attached as Appendix K.

All capitalized terms used in this RFP shall have the meaning set forth in the glossary of defined terms attached as Appendix A. Capitalized terms that are not included in Appendix A shall have the meaning ascribed in this RFP.

1.1 Authority and Purpose of the Request for Proposals

- 1.1.1 This RFP is issued in response to Order No. 37070 issued on April 20, 2020 and Order No. 37139 issued on May 14, 2020 in Docket No. 2015-0389 as part of a procurement process established by the PUC.
- 1.1.2 This RFP is subject to Decision and Order (“D&O”) No. 23121 in Docket No. 03-0372 (To Investigate Competitive Bidding for New Generating Capacity in Hawai‘i), which sets forth the PUC’s Framework for Competitive Bidding (“Framework” or “Competitive Bidding Framework”).
- 1.1.3 Proposers should review Appendix I, Grid Needs Assessment, to inform Proposers as to the system needs and costs based on inputs and assumptions developed through the Company’s integrated grid planning process, and recent renewable dispatchable generation procurements.² The Grid Needs Assessment is intended to inform the development of their Proposals that best meets the needs of the system.

1.2 Scope of the RFP

- 1.2.1 Proposals submitted in response to this RFP shall meet the requirements identified in Part II of Tariff Rule No. 29, Community-Based Renewable Energy Program Phase 2, attached as Appendix J.
- 1.2.2 The Company will only accept Proposals for PV generation paired with BESS Projects (“Paired Projects”).
- 1.2.3 At least 40% of the Project’s capacity must be reserved for residential Subscribers with unsubscribed RDG compensation subject to the requirements in Attachment C of the applicable Mid-Tier SFC. The capacity allocations (%) identified in the Proposal submission will be used in the RFP evaluation process and therefore Proposers will be held to their provided value.
- 1.2.4 Preference will be given to Projects whose Subscriber portion reserves an amount greater than 40% of Project capacity for residential customers and/or any additional amount of

² See <https://www.hawaiianelectric.com/clean-energy-hawaii/our-clean-energy-portfolio/renewable-project-status-board>

Project capacity dedicated to Low- and Moderate-Income Customers (“LMI Customers”), as defined in Tariff Rule No. 29 in Appendix J.

- 1.2.5 Each Proposal submitted in response to this RFP must represent a Project that is capable of meeting the requirements of this RFP without having to rely on the completion or implementation of any other Project, or without having to rely on a proposed change in law, rule, or regulation.
- 1.2.6 Proposals that will require system upgrades and the construction of which, in the reasonable judgment of the Company (in consultation with the Independent Observer), creates a significant risk that their Project’s Guaranteed Commercial Operations Date (“GCOD”) will not be met, will not be considered in this RFP.
- 1.2.7 Projects submitted in response to this RFP must be located on the Island of Moloka‘i.
- 1.2.8 Proposers will determine their Project Site. Proposers have the option of submitting a Proposal using potential Sites offered and described in Section 3.11. Proposers must locate all Project infrastructure within areas of their Site that are outside the 3.2 feet sea level rise exposure area (SLR-XA) as described in the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report (2017)³ and are not located within a Tsunami Evacuation Zone.⁴ All equipment required for a Proposer’s project must be sited within the Proposer’s project site with no assumptions that any equipment will be sited on Company property unless specified by the Company.
- 1.2.9 Projects must interconnect to the Company’s System at the distribution level (12 kV or lower) and must not exceed 250 kW when interconnecting to distribution circuits. Projects interconnecting at the Pala‘au Generating Station must be 1 MW or larger, up to and including 2.5 MW.
- 1.2.10 Projects submitted in response to this RFP must be 250 kW or larger. No single point of failure from the Facility shall result in a decrease in net electrical output greater than 2.2 MW AC.
- 1.2.11 Contracts for Projects selected through this RFP must use the Mid-Tier SFC, as described in Section 3.8. Under the Mid-Tier SFC, the Company shall maintain exclusive rights to fully direct dispatch of the Facility, subject to availability of the resource and Section 1.2.12 below. The term of the Mid-Tier SFC will be 20 years.

³ Hawai‘i Climate Change Mitigation and Adaptation Commission. 2017. Hawai‘i Sea Level Rise Vulnerability and Adaptation Report. Prepared by Tetra Tech, Inc. and the State of Hawai‘i Department of Land and Natural Resources, Office of Conservation and Coastal Lands, under the State of Hawai‘i Department of Land and Natural Resources Contract No: 64064. This report is available at: https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report_Dec2017.pdf

⁴ See Hawai‘i Sea Level Rise Viewer at <https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/>, and National Oceanic and Atmospheric Administration (NOAA) interactive map in partnership with the State of Hawai‘i at <https://tsunami.coast.noaa.gov/#/>. Projects infrastructure must be outside the “Tsunami Evacuation Zone” (but not necessary to be outside the “Extreme Tsunami Evacuation Zone”).

1.2.12 The BESS component of a Paired Project will be charged during periods when full potential export of the generation component is not being dispatched by the Company, and the BESS component can be used to provide energy to the Company during other times that are beneficial to the system. The BESS component of a Paired Project must be sized to support the Facility's Allowed Capacity (in MW) for a minimum of four (4) continuous hours throughout the term of the Mid-Tier SFC.

For example, for a 2 MW facility, the BESS component must be able to store and discharge at least 8 MWh of energy at 2 MW in a cycle throughout the term of the Mid-Tier SFC.

1.2.13 All Paired Projects must be able to be charged from the grid at the direction of the Company after the 5-year Investment Tax Credit ("ITC") recapture period has lapsed. Paired Projects that are incapable of claiming the ITC must be capable of being 100% charged from the grid from the GCOD.

1.2.14 The amount of energy discharged from any BESS component in a year will be limited to the energy storage contract capacity (in MWh) multiplied by the number of Days in that year. A BESS component may be dispatched more than once per Day, subject to such discharge energy limitations.

1.2.15 Proposals must specify a GCOD no later than August 31, 2026. Preference will be given to Proposals that specify an earlier GCOD during the non-price evaluation. A Proposer's GCOD set forth in its Proposal will be the GCOD in any resulting Mid-Tier SFC if such Proposal is selected to the Final Award Group. Proposers will not be able to request a change in the GCOD set forth in their Proposals. Proposals that propose an earlier GCOD will be scored higher during the Initial Evaluation phase (see Chapter 4).

1.2.16 If selected, Proposers will be responsible for all costs throughout the term of the Mid-Tier SFC, including but not limited to Project development, completion of an Interconnection Requirements Study ("IRS"), land acquisition, permitting, financing, construction of the Facility and all Interconnection Facilities, and the operation and maintenance ("O&M") of the Facility.

1.2.17 If selected, Proposers will be solely responsible for the decommissioning of the Project and the restoration of the Site upon the expiration of the Mid-Tier SFC, as described in Attachment G, Section 7 of the Mid-Tier SFC.

1.2.18 If selected, Proposers shall pursue all available applicable federal and state tax credits. Proposal pricing must be set to incorporate the benefit of such available federal tax credits. However, to mitigate the risk on Proposers due solely to potential changes to the state's tax credit law before a selected project reaches commercial operations, Proposal pricing shall be set without including any state tax credits. If a Proposal is selected, the Mid-Tier SFC for the project will require the Proposer to pursue the maximum available state tax credit and remit tax credit proceeds to the Company for customers' benefit as described in Attachment J of the Mid-Tier SFC. The Mid-Tier SFC will also provide that

the Proposer will be responsible for payment of liquidated damages for failure to pursue the state tax credit.

1.3 Competitive Bidding Framework

Consistent with the Framework, this RFP outlines the Company's requirements in relation to the resources being solicited and the procedures for conducting the RFP process. It also includes information and instructions to prospective Proposers participating in and responding to this RFP.

1.4 Role of the Independent Observer

1.4.1 Part III.C.1 of the Framework sets forth the circumstances under which an Independent Observer is required in a competitive bidding process. The Independent Observer will advise and monitor all phases of the RFP process and will coordinate with PUC staff throughout the RFP process to ensure that the RFP is undertaken in a fair and unbiased manner. In particular, the Company will review and discuss with the Independent Observer decisions regarding the evaluation, disqualification, non-selection, and selection of Proposals.

1.4.2 The role of the Independent Observer, as described in the Framework, will include but is not limited to:

- Monitor all steps in the competitive bidding process
- Monitor communications (and communications protocols) with Proposers
- Monitor adherence to the Company's Code of Conduct
- Submit comments and recommendations, if any, to the PUC concerning the RFP
- Review the Company's Proposal evaluation methodology, models, criteria, and assumptions
- Review the Company's evaluation of Proposals
- Advise the Company on its decision-making
- Participate in dispute resolution as set forth in Section 1.10
- Report to the PUC on monitoring results during each stage of the competitive bidding process
- Provide an overall assessment of whether the goals of the RFP were achieved

1.4.3 The Independent Observer for this RFP is: **Arroyo Seco Consulting**.

1.5 Communications Between the Company and Proposers – Code of Conduct Procedures Manual

1.5.1 Communications and other procedures under this RFP are governed by the "Code of Conduct Procedures Manual," (also referred to as the "Procedures Manual") developed by the Company as required by the Framework, and attached as Appendix C.

1.5.2 All pre-Proposal communication with prospective Proposers will be conducted via the Company's RFP website, Electronic Procurement Platform, and/or electronic mail ("Email") through the address specified in Section 1.6 (the "RFP Email Address").

Phone communication or face-to-face meetings will not be supported. Frequently asked questions submitted by prospective Proposers and the answers to those questions may be posted on the Company's RFP website. The Company reserves the right to respond only to comments and questions it deems are appropriate and relevant to the RFP. Proposers shall submit questions no later than fifteen Days before the Proposal Due Date (RFP Schedule in Section 3.1, Items 6 and 7). The Company will endeavor to respond to all questions no later than five Days before the Proposal Due Date.

- 1.5.3 After Proposals have been submitted, the Company may contact individual Proposers for purposes of clarifying their Proposal(s).
- 1.5.4 Any confidential information deemed by the Company, in its sole discretion, to be appropriate to share, will only be transmitted to the requesting party after receipt of a fully executed CBRE Mutual Confidentiality and Non-Disclosure Agreement ("CBRE NDA"). See Appendix E.
- 1.5.5 Except as expressly permitted and in the manner prescribed in the Procedures Manual, any unsolicited contact by a Proposer or prospective Proposer with personnel of the Company pertaining to this RFP is prohibited.

1.6 Company Contact for Proposals

The primary contact for this RFP is:

Kyle Blickley
Energy Contract Manager
Hawaiian Electric Company, Inc.

RFP Email Address: cbrerfp@hawaiianelectric.com

1.7 Proposal Submission Requirements

- 1.7.1 All Proposals must be prepared and submitted in accordance with the procedures and format specified in the RFP. Proposers are required to respond to all questions and provide all information requested in the RFP, as applicable, and only via the communication methods specified in the RFP.
- 1.7.2 Detailed requirements regarding the form, submission, organization and information for the Proposal are set forth in Chapter 3 and Appendix B.
- 1.7.3 Proposals must not rely on any information that is not contained within the Proposal itself in demonstrating compliance for any requirement in this RFP.

In submitting a Proposal in response to this RFP, each Proposer certifies that the Proposal has been submitted in good faith and without fraud or collusion with any other unaffiliated person or entity. The Proposer shall acknowledge this in the Response Package submitted with its Proposal. In addition, in submitting a Proposal, a Proposer will be required to provide Company with its legal counsel's written certification in the

form attached as Appendix B Attachment 1 certifying in relevant part that irrespective of any Proposer’s direction, waiver, or request to the contrary, that the attorney will not share a Proposer’s confidential information associated with such Proposer with others. If legal counsel represents multiple unaffiliated Proposers whose Proposals are selected for the Final Award Group, such counsel will also be required to submit a similar certification at the conclusion of power purchase agreement negotiations that he or she has not shared a Proposer’s confidential information or the Company’s confidential information associated with such Proposer with others.

- 1.7.4 All Proposals must be submitted via the Electronic Procurement Platform by 2:00 pm Hawai‘i Standard Time (“HST”) on the Proposal Due Date shown in the RFP Schedule in Section 3.1. No hard copies of these Proposals will be accepted by the Company.

It is the Proposer’s sole responsibility to ensure that complete and accurate information has been submitted on time and consistent with the instructions of this RFP. With this assurance, Company shall be entitled to rely upon the completeness and accuracy of every Proposal. Any errors identified by the Proposer or Company after the Proposal Due Date has passed may jeopardize further consideration and success of the Proposal. If an error or errors are later identified, Company, in consultation with the Independent Observer, may permit the error(s) to be corrected without further revision to the Proposal, or may require Proposer to adhere to terms of the Proposal as submitted without correction. Additionally, and in Company’s sole discretion, if such error(s) would materially affect the Priority List or Final Award Group, Company reserves the right, in consultation with the Independent Observer, to remove or disqualify a Proposal upon discovery of the material error(s). The Proposer of such Proposal shall bear the full responsibility for such error(s) and shall have no recourse against Company’s decision to address Proposal error(s), including removal or disqualification. The Energy Contract Manager, in consultation with the Independent Observer, will confirm that the Self-Build Proposals were submitted by milestone (6) Self-Build Proposal Due Date in Section 3.1, Table 1. The Electronic Procurement Platform automatically closes to further submissions after the IPP and Affiliate Proposal Due Date in Section 3.1 Item 7.

1.8 Proposal Fee

- 1.8.1 IPP and Affiliate proposers are required to tender a non-refundable Proposal Fee, based on the size of the proposed Project, for each Proposal submitted.

Project Size	Proposal Fee
250 kW	\$1,000
1 MW and larger, up to and including 2.5 MW	\$2,000

- 1.8.2 Proposers may submit up to two (2) variations of their Proposal, one of which is the base variation of the Proposal, under a single Proposal Fee.
- 1.8.3 Variations of pricing terms or Facility size can be offered. Variations which propose a different Site will not be considered and will be deemed a separate Proposal, and a separate Proposal Fee must be paid for each such Proposal. All unique information for each variation of a Proposal, no matter how minor such variation is, must be clearly identified and separated by following the instructions in Appendix B Section 4.
- 1.8.4 The Proposal Fee must be in the form of a cashier's check from a U.S.-chartered bank made payable to "Maui Electric Company, Ltd." and must be delivered and received by the Company by 2:00 pm (HST) on the Proposal Due Date shown in the RFP Schedule in Section 3.1, Table 1, Item 7. The cashier's check should include a reference to the Proposal(s) for which the Proposal Fee is being provided. Proposers must identify in the Proposal Response Package (instructions in Appendix B Section 1.3.1) the delivery information for its Proposal Fee. Proposers are strongly encouraged to utilize a delivery service method that provides proof of delivery to validate delivery date and time.

If the Proposal Fee is delivered by U.S. Postal Service (with registered, certified, receipt verification), the Proposer shall address it to:

Kyle Blickley
Energy Contract Manager
Hawaiian Electric Company, Inc.
Mail Code CP21-IU
PO Box 2750
Honolulu, Hawai'i 96840

If the Proposal Fee is delivered by other courier services, the Proposer shall address it to:

Hawaiian Electric Company, Inc
Ward Receiving
Attention: Kyle Blickley, Energy Contract Manager
Mail Code CP21-IU
799 S. King St.
Honolulu, Hawai'i 96813

Due to COVID-19 disease prevention measures, Proposal Fees cannot be delivered in person.

1.9 Procedures for the Self-Build or Affiliate Proposals

- 1.9.1 Order No. 37070 states that the CBRE RFPs will be open to all bidders, including the Company. The Competitive Bidding Framework allows the Company the option to offer a Proposal(s) in response to this RFP ("Self-Build Option" or "SBO"). Accordingly, the Company must follow certain requirements and procedures designed to safeguard against and address concerns associated with: (1) preferential treatment of the SBO or members,

agents, or consultants of the Company formulating the SBO (the “Self-Build Team”); and (2) preferential access to proprietary information by the Self-Build Team. These requirements are specified in the Code of Conduct (“CBRE Code of Conduct”) required under the Framework and implemented by certain rules and procedures found in the Procedures Manual submitted to the PUC in Docket No. 2015-0389 on July 9, 2020. The CBRE Code of Conduct will apply to all CBRE Phase 2 RFPs, regardless of whether the Company submits an SBO Proposal. A copy of the Procedures Manual is attached as Appendix C.

The Competitive Bidding Framework also allows Affiliates of the Company to submit Proposals⁵ to RFPs issued by the Company. All Self-Build and Affiliate Proposals are subject to the Company’s Code of Conduct and the Procedures Manual. Affiliate Proposals are also subject to any applicable Affiliate Transaction Requirements issued by the PUC in Decision and Order No. 35962 on December 19, 2018, and subsequently modified by Order No. 36112, issued on January 24, 2019, in Docket No. 2018-0065. However, for Affiliate Proposals for Mid-Tier Projects, the PUC will not require an additional review pursuant to the Affiliate Transaction Requirements, but will hold Affiliate Proposals to the terms of their Proposals. Affiliate Proposals will be treated identically to IPP Proposals and must be submitted electronically through the Electronic Procurement Platform by the IPP and Affiliate Proposal Due Date in RFP Section 3.1, Table 1, Item 7.

- 1.9.2 The Company will require that the Proposal for the SBO(s) and Affiliate Proposals be submitted electronically through the Electronic Procurement Platform. SBO Proposals will be due a minimum of one (1) Day before other Proposals are due. A Proposal for the SBO will be uploaded into the Electronic Procurement Platform in the same manner Proposals from other Proposers are uploaded. The Energy Contract Manager, in consultation with the Independent Observer, will confirm that the Self-Build Proposals are timestamped by the Self-Build Proposal Due Date found in RFP Section 3.1, Table 1, Item 6.
- 1.9.3 Detailed requirements for an SBO Proposal can be found in Appendix G. These requirements are intended to provide a level playing field between SBO Proposals and third-party Proposals. Except where specifically noted, an SBO Proposal must adhere to the same price and non-price Proposal requirements as required of all Proposers, as well as certain Mid-Tier SFC requirements, such as milestones and liquidated damages, as described in Appendix G. The non-negotiability of the Performance Standards shall apply to any SBO to the same extent it would for any other Proposal. In addition to its Proposal, the Self-Build Team will be required to submit Appendix G Attachment 1, Self-Build Option Team Certification Form, acknowledging it has followed the rules and requirements of the RFP to the best of its ability and has not engaged in any collusive actions or received any preferential treatment or information providing an impermissible competitive advantage to the Self-Build Team over other Proposers responding to this RFP, as well as adherence to Mid-Tier SFC terms and milestones required of all Proposers and the SBO’s proposed cost protection measures.

⁵ A Proposal will also be treated as an Affiliate Proposal if the Affiliate is a partner for the Proposal.

The cost recovery methods between a regulated utility SBO Proposal and IPP Proposals are fundamentally different due to the business environments they operate in. As a result, the Company has instituted a process to compare the two types of proposals for the initial evaluation of the price related criteria on a 'like' basis through comparative analysis.

At the core of an SBO Proposal are its total project capital cost and any associated annual operations and maintenance ("O&M") costs. During the RFP's initial pricing evaluation step, these capital costs⁶ and O&M costs will be used in a revenue requirement calculation to determine the estimated revenues needed from customers which would allow the Company to recover the total cost of the project. The SBO revenue requirements are then used in a levelized benefit calculation to determine a Levelized Benefit ("LB") (\$/MWh) which will then be used for comparison to IPP and any Affiliate Proposals.

The Company, in conjunction with the Independent Observer, may also conduct a risk assessment of the SBO Proposal to ensure an appropriate level of customer cost protection measures are included in such Proposal.

If the SBO is not included in any share savings mechanism for this RFP pre-approved by the Commission, the SBO will be permitted to submit a shared savings mechanism with its Proposal to share in any cost savings between the amount of cost bid in the SBO Proposal and the actual cost to construct the Project. If the SBO Proposal is selected to the Final Award Group, the proposed shared savings mechanism will need to be approved by the PUC. Submission of a shared savings mechanism is not required and will not be considered in the evaluation of the SBO Proposal.

1.10 Dispute Resolution Process

- 1.10.1 If disputes arise under the RFP, the provisions of Section 1.10 and the dispute resolution process established in the Framework will control (see Part V of the Framework).
- 1.10.2 Proposers who challenge or contest any aspect of the RFP process must first attempt to resolve their concerns with the Company and the Independent Observer ("Initial Meeting"). The Independent Observer will seek to work cooperatively with the parties to resolve any disputes or pending issues and may offer to mediate the Initial Meeting to resolve disputes prior to such issues being presented to the PUC.
- 1.10.3 Any and all disputes arising out of or relating to the RFP which remain unresolved for a period of twenty (20) Days after the Initial Meeting takes place may, upon the agreement of the Proposer and the Company, be submitted to confidential Mediation in Honolulu, Hawai'i, pursuant to and in accordance with the Mediation Rules, Procedures, and Protocols of Dispute Prevention Resolution, Inc. ("DPR") (or its successor) or, in its absence, the American Arbitration Association then in effect ("Mediation"). The Mediation will be administered by DPR. If the parties agree to submit the dispute to

⁶ SBO Proposals will be required to provide a table identifying project costs by year. These capital costs should be all inclusive, including but not limited to costs associated with equipment, Engineering, Procurement, and Construction ("EPC"), interconnection, overhead, and Allowance for Funds Used During Construction ("AFUDC").

Mediation, the Proposer and the Company shall each pay fifty percent (50%) of the cost of the Mediation (i.e., the fees and expenses charged by the mediator and DPR) and shall otherwise each bear their own Mediation costs and attorney's fees.

- 1.10.4 If settlement of the dispute is not reached within sixty (60) Days after commencement of the Mediation, or if after the Initial Meeting, the parties do not agree to submit any unresolved disputes to Mediation, then as provided in the Framework, the Proposer may submit the dispute to the PUC in accordance with the Framework.
- 1.10.5 In accordance with the Framework, the PUC will serve as the arbiter of last resort for any disputes relating to this RFP involving Proposers. The PUC will use an informal expedited dispute resolution process to resolve the dispute within thirty (30) Days, as described in Parts III.B.8 and V of the Framework.⁷ There will be no right to hearing or appeal from this informal expedited dispute resolution process.
- 1.10.6 If any Proposer initiates a dispute resolution process for any dispute or claim arising under or relating to this RFP, other than that permitted by the Framework and Section 1.10 of this RFP (e.g., a court proceeding), then such Proposer shall be responsible for any and all attorneys' fees and costs that may be incurred by the Company or the PUC in order to resolve such claim.

1.11 No Protest or Appeal

Subject to Section 1.10, no Proposer or other person will have the right to protest or appeal any award or disqualification of a Project made by the Company.

By submitting a Proposal in response to the RFP, the Proposer expressly agrees to the terms and conditions set forth in this RFP.

1.12 Modification or Cancellation of the Solicitation Process

- 1.12.1 Unless otherwise expressly prohibited, the Company may, at any time up to the final execution of a Mid-Tier SFC, as may be applicable, in consultation with the Independent Observer, postpone, withdraw, and/or cancel any requirement, term, or condition of this RFP, including deferral of the award of any contract, and/or cancellation of the award all together, all of which will be without any liability to the Company.
- 1.12.2 The Company may modify this RFP subject to requirements of the Framework, whereby the modified RFP will be reviewed by the Independent Observer and submitted to the PUC thirty (30) Days prior to its issuance, unless the PUC directs otherwise (see Framework Part IV.B.10). The Company will follow the same procedure with regard to

⁷ The informal expedited dispute resolution process does not apply to PUC review of contracts that result from the RFP. See Decision and Order No. 23121 at 34-35. Further, the informal expedited dispute resolution process does not apply to the Framework's process relating to issuance of a draft and final RFP, and/or to the PUC approval of the RFP because: (1) the Framework (and the RFP) set forth specific processes whereby interested parties may provide input through the submission of comments; and (2) the Framework's dispute resolution process applies to "Bidders" and there are no "Bidders" at this stage in the RFP process.

any potential postponement, withdrawal, or cancellation of the RFP or any portion thereof.

Chapter 2: Resource Needs and Requirements

2.1 Performance Standards

Proposals must meet the attributes set forth in this RFP, the technical requirements identified in Appendix I of Rule 14H, and the requirements of the Mid-Tier SFC. This RFP, Rule 14H, and the Mid-Tier SFC set forth the minimum requirements that all Proposals must satisfy to be eligible for consideration in this RFP. If there is a conflict between the Performance Standards in Rule 14H and the Mid-Tier SFC, the contract terms will control. Additional Performance Standards may be required based on the results of the IRS.

Facilities that are 1 MW or larger must be able to operate in grid-forming mode when directed by the Company as defined in the Mid-Tier SFC.

Black start capability⁸ is required for Paired Projects that are 1 MW or larger. For these facilities, the ability to startup without requiring energy from the grid (Black start capability) is also required including energization of the interconnection transformers. The company may use the facility to assist in system restoration, based upon energy availability and BESS state of charge.

- 2.1.1 For Paired Projects, the functionality and characteristics of the BESS must be maintained throughout the term of the Mid-Tier SFC. To be clear, Proposers may not propose any degradation for either capacity or efficiency in their Proposals.

2.2 Distribution-Level System Information

Proposers are encouraged to use the Locational Value Maps located at <https://www.hawaiianelectric.com/clean-energy-hawaii/integration-tools-and-resources/locational-value-maps> to determine circuit capacity. However, while the Locational Value Map provides information regarding an initial assessment of the potential MW hosting capacity for distribution level circuits, these numbers should only be used as a screening tool to select a circuit that will provide a higher likelihood of interconnection. This is because the methodology used to develop these hosting capacity numbers is geared towards smaller distributed energy resources (“DER”) and does not include the scenario of a larger DER interconnecting at one point. As a result, load flow analyses are required to confirm the impact to line capacities and voltage limits. Detailed load flow analyses will be performed as part of the project selection

⁸ The ability to start itself and provide power to the Company's grid without relying on any services or energy from the Company's grid in order to assist the grid in recovering from a total or partial shutdown. During such a total or partial shutdown of the grid, the Project may experience step changes in load and other transient and dynamic conditions as it picks up load without support from other resources on the system during start-up (if the Project remains connected) or while connecting to the loads the Project is picking up (not the start-up and connecting of the Facility itself).

process. Prior to submitting a proposal, Proposers are encouraged to inquire about the viability of interconnecting a proposed Project at a specific location. Direct questions to the RFP Email Address in Section 1.6.

- 2.2.1 A detailed IRS, when performed, may reveal other adverse system impacts that may further limit a Project's ability to interconnect and/or further limit the net output of the Facility without upgrades.

2.3 Interconnection to the Company System

The Proposer must provide information pertaining to the design, development, and construction of the Interconnection Facilities. Interconnection Facilities includes both: (1) Seller-Owned Interconnection Facilities; and (2) Company-Owned Interconnection Facilities.

- 2.3.1 All Proposals must include a description and conceptual or schematic diagrams of the Proposer's plan to transmit power from the Facility to the Company System. The proposed Interconnection Facilities must be compatible with the Company System. In the design, Projects must adequately consider Company requirements to address impacts on the performance and reliability of the Company System.
 - 2.3.1.1 In addition to the Performance Standards and findings of the IRS, the design of the Interconnection Facilities, including power rating, Point(s) of Interconnection with the Company System, and scheme of interconnection, must meet Company standards. The Company will provide its construction standards and procedures to the Proposer (Engineer, Procure, Construct Specifications for Hawaiian Electric Power Lines and Substations) if requested via the communication methods identified in Section 1.5 and upon the execution of a CBRE NDA as specified in Section 3.12.1. These specifications are intended to illustrate the scope of work typically required to administer and perform the design and construction of a Maui Electric substation and power line.
 - 2.3.1.2 Interconnection Facilities must be designed such that it meets or exceeds the applicable single line diagram in Appendix H.
- 2.3.2 Tariff Rule No. 19, a copy of which is attached as Appendix I, establishes provisions for Interconnection and Transmission Upgrades and can be found at <https://www.hawaiianelectric.com/billing-and-payment/rates-and-regulations/>. While the Moloka'i System does not have a traditional Transmission System, the tariff provisions are intended to simplify the rules regarding who pays for, installs, owns, and operates interconnection facilities in the context of competitive bidding. The Company will be responsible for building all Company-Owned Interconnection Facilities for a selected Project.
- 2.3.3 The Proposer shall be responsible for all costs required to interconnect a Project to the Company System, including all Seller-Owned Interconnection Facilities and Company-Owned Interconnection Facilities.

- 2.3.4 Proposers are required to include in their pricing proposal all costs for interconnection and equipment expected to be required between their Facility and their proposed Point of Interconnection. Appendix H includes information related to Company-Owned Interconnection Facilities and costs that may be helpful to Proposers. Selected Proposers shall be responsible for the actual final costs of all Seller-Owned Interconnection Facilities and Company-Owned Interconnection Facilities (see Appendix H, Attachment 1 or Attachment 2), whether or not such costs exceed the costs set forth in a Proposer's Proposal. No adjustments will be allowed to the proposed price in a Proposal if actual costs for Interconnection Facilities exceed the amounts proposed.
- 2.3.5 Proposers are required to include in their pricing proposal all costs for distribution-level service interconnection for station power.
- 2.3.6 All Projects will be screened for general readiness to comply with the requirements for interconnection. Proposals selected to the Final Award Group will be subject to Section 5.1.1. Proposals selected to the Final Award Group may be subject to further study in the form of an IRS. The IRS process is further described in Section 5.1. The results of the completed IRS or as identified through the Detailed Evaluation process, as well as any mitigation measures identified, will be incorporated into the terms and conditions of a final executed Mid-Tier SFC.

Chapter 3: Instructions to Proposers

3.1 Schedule for the Proposal Process

Table 1 sets forth the proposed schedule for the proposal process (the "RFP Schedule"). The RFP Schedule is subject to PUC approval. The Company reserves the right to revise the RFP Schedule as necessary. Changes to the RFP Schedule prior to the RFP Proposal Due Date will be posted to the RFP website. Changes to the RFP Schedule after the Proposal Due Date will be communicated via Email to the Proposers and posted on the RFP Website.

**Table 1
Proposed RFP Schedule**

Milestone	Schedule Dates
(1) Draft RFP filed	July 9, 2020
(2) Technical Status Conference	July 29, 2020
(3) Parties and Participants file Comments by	August 12, 2020
(4) Proposed Final RFP filed	September 8, 2020
(5) Updated RFP Draft filed Per Order 37592	March 30, 2021
(6) Parties and Participants file Comments by	April 14, 2021
(7) Proposed Updated RFP filed	May 14, 2021 ⁹
(8) Final RFP is Issued	June 14, 2021 ¹⁰
(9) Self-Build Proposal Due Date	August 16, 2021 at 2:00 pm HST
(10) IPP and Affiliate Proposal Due Date	August 17, 2021 at 2:00 pm HST
(11) Selection of Priority List	October 18, 2021
(12) BAFOs Due	October 25, 2021
(13) Selection of Final Award Group	February 14, 2022
(14) Contract Execution Start	February 24, 2022

3.2 Company RFP Website/Electronic Procurement Platform

3.2.1 The Company has established a website for general information to share with potential Proposers. The RFP website is located at the following link:

www.hawaiianelectric.com/competitivebidding

The Company will provide general notices, updates, schedules and other information on the RFP website throughout the process. Proposers should check the website frequently to stay abreast of any new developments. This website will also contain the link to the Electronic Procurement Platform employed by the Company for the receipt of Proposals.

“Sourcing Intelligence” developed by Power Advocate is the Electronic Procurement Platform that the Company has licensed and will utilize for the receipt of Proposals in this RFP. Proposers who do not already have an existing account with PowerAdvocate and who intend to submit a Proposal for this RFP will need to register as a “Supplier” with PowerAdvocate.

⁹ This date and all subsequent dates in the proposed schedule are dependent on any further guidance provided by the PUC.

¹⁰ Per Section IV.B.6.e.ii of the Competitive Bidding Framework “[t]he utility shall have the right to issue the RFP if the Commission does not direct the utility to do otherwise within thirty (30) days after the Commission receives the proposed RFP and the Independent Observer's comments and recommendations.” June 14, 2021 is based on this thirty (30) day timeline. However, this date and all subsequent dates in the proposed schedule are dependent on any further guidance provided by the PUC.

- 3.2.2 There are no license fees, costs, or usage fees to Proposers for the use of the Electronic Procurement Platform.

See [Appendix D](#) for user information on and screenshots of PowerAdvocate's Sourcing Intelligence procurement platform.

3.3 Information Exchange

The PUC conducted a Technical Status Conference on July 29, 2020 to discuss the draft RFP. Parties and Participants had the opportunity to submit comments on the draft RFP. The Company then revised the RFP after considering the comments received and filed a final RFP for PUC review and approval. Subsequently, the PUC issued Order No. 37592 which among other things, directed the Companies to further collaborate with the Parties and Participants. As a result, the Company held several meetings with the Parties and Participants, which helped inform further updates to the RFP that were reflected in the Company's submittal of an updated RFP to the PUC.

Additionally, the Company will hold a prerecorded webinar for CBRE in accordance with the Competitive Bidding Framework for prospective Proposers to learn about the provisions and requirements of this RFP. This prerecorded webinar will be posted to the Company's website within one week of the issuance of the final RFP.

Prospective Proposers may also submit written questions regarding the RFP to the RFP Email Address set forth in [Section 1.6](#). The Company will endeavor to address all questions that will be helpful to prospective Proposers via a Q&A section on the RFP website.

Prospective Proposers should review the RFP Website's Q&A section prior to submission of their Proposal. Duplicate questions will not be answered.

3.4 Preparation of Proposals

- 3.4.1 Each Proposer shall be solely responsible for reviewing the RFP (including all attachments and links) and for thoroughly investigating and informing itself with respect to all matters pertinent to this RFP, the Proposer's Proposal, and the Proposer's anticipated performance under the Mid-Tier SFC. It is the Proposer's responsibility to ensure it understands all requirements of the RFP, to seek clarification if the RFP's requirements or Company's request is not clear, and to ask for any confirmation of receipt of submission of information. Under [Section 1.7.5](#), the Proposer is solely responsible for all errors in its Proposal(s). The Company will not accept any explanation by a Proposer that it was incumbent on the Company to catch any error.
- 3.4.2 Proposers shall rely only on official information provided by the Company in this RFP when preparing their Proposal. The Company will rely only on the information included in the Proposals, and additional information solicited by the Company to Proposers in the format requested, to evaluate the Proposals received. Evaluation will be based on the stated information in this RFP and on information submitted by Proposers in response to this RFP. Proposals must clearly state all capabilities, functionality and characteristics of

the Project; must clearly detail plans to be performed; must explain applicability of information; and must provide all referenced material if it is to be considered during the Proposal evaluation. Referencing previous RFP submissions or projects for support will not be considered. Proposers should not assume that any previous RFP decisions or preferences will also apply to this RFP.

- 3.4.3 Each Proposer shall be solely responsible for, and shall bear all of its costs incurred in the preparation of its Proposal and/or its participation in this RFP, including, but not limited to, all costs incurred with respect to the following: (1) review of the RFP documents; (2) status conference participation; (3) site visits; (4) third-party consultant consultation; and (5) investigation and research relating to its Proposal and this RFP. The Company will not reimburse any Proposer for any such costs, including the selected Proposer(s).
- 3.4.4 Each Proposal must contain the full name and business address of the Proposer and must be signed by an authorized officer or agent¹¹ of the Proposer.

3.5 Organization of the Proposal

The Proposal must be organized as specified in Appendix B. It is the Proposer's responsibility to ensure the information requested in this RFP is submitted and contained within the defined proposal sections as specified in Appendix B.

3.6 Proposal Limitations

Proposers expressly acknowledge that Proposals are submitted subject to the following limitations:

The RFP does not commit or require the Company to award a contract, pay any costs incurred by a Proposer in the preparation of a Proposal, or procure or contract for products or services of any kind whatsoever. The Company reserves the right, in consultation with the Independent Observer, to accept or reject, in whole or in part, any or all Proposals submitted in response to this RFP, to negotiate with any or all Proposers eligible to be selected for award, or to withdraw or modify this RFP in whole or in part at any time.

- The Company reserves the right, in consultation with the Independent Observer, to request additional information from any or all Proposers relating to their Proposals or to request that Proposers clarify the contents of their Proposals. Proposers who are not responsive to such information requests may be eliminated from further consideration upon consultation with the Independent Observer.
- The Company reserves the right, in consultation with the Independent Observer, to solicit additional Proposals from Proposers after reviewing the initial Proposals.

¹¹ Proposer's officer or agent must be authorized to sign the Proposal. Such authorization must be in writing and may be granted via Proposer's organizational documents (i.e., Articles of Incorporation, Articles of Organization, By-laws, etc.), resolution, or similar documentation.

Other than as provided in this RFP, no Proposer will be allowed to alter its Proposal or add new information to a Proposal after the Proposal Due Date.

- All material submitted in response to this RFP will become the sole property of the Company, subject to the terms of the CBRE NDA.

3.7 Proposal Compliance and Bases for Disqualification

Proposers may be deemed non-responsive and/or Proposals may not be considered for reasons including, but not limited to, the following:

- Any unsolicited contact by a Proposer or prospective Proposer with personnel of the Company pertaining to this RFP as described in Section 1.5.5.
- Any illegal or undue attempts by or on behalf of the Proposer or others to influence the Proposal Review process.
- The Proposal does not meet one or more of the Eligibility Requirements specified in Section 4.2.
- The Proposal does not meet one or more of the Threshold Requirements specified in Section 4.3.
- The Proposal is deemed to be unacceptable through a fatal flaws analysis as described in Section 4.4.2.
- The Proposer does not respond to a Company request for additional information to clarify the contents of its Proposal within the timelines specified by the Company.
- The Proposal contains misrepresentations or errors.

3.8 Power Purchase Agreement

- 3.8.1 The Power Purchase Agreement for proposals selected under this RFP for Mid-Tier Projects will be in the form of a pre-approved Mid-Tier SFC, attached as Appendix K. The Mid-Tier SFC will be reviewed and pre-approved by the PUC and as a result, will not be negotiable.
- 3.8.2 If selected, any Affiliate Proposers will be required to enter into the Mid-Tier SFC with the Company.
- 3.8.3 If selected, a Self-Build Proposer will not be required to enter into a Mid-Tier SFC with the Company. However, the SBO will be held to the same performance metrics and milestones set forth in the Mid-Tier SFC to the same extent as all Proposers, as attested to in the SBO's Appendix G Attachment 1, Self-Build Option Certification submittal. If liquidated damages are assessed, they will be paid from shareholder funds and returned to

customers through the Purchased Power Adjustment Clause (“PPAC”) or other appropriate rate adjustment mechanisms.

- 3.8.4 In general, under the Mid-Tier SFC, payment to the Seller consists of a Lump Sum Payment component to cover the costs of the Project. In return, the Seller shall guarantee minimum performance and availability metrics to ensure that the Facility is maintained and available for energy storage and dispatch, as well as provide an indication of the available energy in near real-time for the Company’s dispatch. Company shall not be obligated to accept, nor shall it be required to pay for, test energy generated by the Facility during acceptance testing or other test conditions.
- 3.8.5 The Performance Standards identified in Section 2.1 establish the minimum requirements a Proposal must satisfy to be eligible for consideration in this RFP. A proposed Facility’s ability to meet these Performance Standards is both a Threshold Requirement and a Non-Price Related Criteria under Sections 4.3 and 4.4.2, respectively. As such, these Performance Standards are non-negotiable by a Self-Build Proposer or any other Proposer.

3.9 Pricing Requirements

- 3.9.1 Proposers must submit pricing for each of their variations associated with each Proposal (if variations as described in Section 1.8.2 and 1.8.3 are submitted). Proposers are responsible for understanding the terms of the Mid-Tier SFC. Pricing cannot be specified as contingent upon other factors (e.g., changes to federal tax policy or receiving all Investment Tax Credits assumed).
- 3.9.2 Escalation in pricing over the term of the Mid-Tier SFC is prohibited.
- 3.9.3 Pricing information must only be identified within specified sections of the Proposal instructed by this RFP’s Appendix B Proposer’s Response Package (i.e., Proposal pricing information must be contained within defined Proposal sections of the Proposal submission). Pricing information contained anywhere else in a Proposal will not be considered during the evaluation process.
- 3.9.4 The Proposer’s Response Package must include the following prices for each Proposal (and variation):

For IPP or Affiliate proposals:

- **Lump Sum Payment (\$/year):** Payment amount for full dispatchability of the Facility. Payment will be made in monthly increments.

For Self-Build Proposals:

- **Total Project Capital Costs (\$/year):** Total capital costs for the project (identified by year).

- **Annual O&M Costs (\$/year):** Initial year operations and maintenance costs, annual escalation rate.
- **Annual Revenue Requirement (\$/year):** Annual revenue requirements (ARR) calculated for each year.

See Appendix G for descriptions and detail on the Total Project Capital Costs, Annual O&M Costs, and Annual Revenue Requirement for the Self-Build Proposals.

- 3.9.5 As identified in the Schedule of Defined Terms in the Mid-Tier SFC under “BESS Allocated Portion of the Lump Sum Payment”, the allocated portion of the Lump Sum Payment specified for energy storage for the Facility for determining liquidated damages is 50% and shall be a non-negotiable percentage in the Mid-Tier SFC.

3.10 Project Description

- 3.10.1 Proposals are required to provide a Net Energy Potential (“NEP”) RFP Projection for the Project. The NEP RFP Projection associated with the proposed Project represents the estimated annual net energy (in MWh) that could be produced by the Facility and delivered to the Point of Interconnection over a ten-year period with a probability of exceedance of 95%. For Paired Projects, the energy generated by the Facility in excess of Company dispatch but below the Facility’s Allowed Capacity that is stored in the Facility’s BESS component and can later be discharged to the POI considering the BESS Contract Capacity and Maximum Rated Output should be included in the NEP RFP Projection. Any energy in excess of what is allowed to be delivered to the POI and would exceed the BESS Contract Capacity shall be excluded from the Net Energy Potential. To achieve this objective, the BESS Contract Capacity (MWh) must be at least four times the MW Capacity of the installed PV Capacity. Any energy generated outside of the proposed Facility that is used to charge the BESS component should not be factored into the NEP RFP Projection. Any losses that may be incurred from energy being stored and then discharged from the BESS (round trip efficiency losses) should be excluded from the NEP RFP Projection, but the NEP should consider auxiliary loads in developing the value relative to the POI. The NEP RFP Projection will be used in the RFP evaluation process and therefore Proposers will be held to their provided value.¹²
- 3.10.2 Paired Project Proposals are required to provide a single value Round Trip Efficiency (“RTE”), measured at the Point of Interconnection, that the Facility’s BESS component is required to maintain throughout the term of the Mid-Tier SFC. This RTE value will be used in the RFP evaluation process and therefore Proposers will be held to this provided

¹² If a Proposal is selected to the Final Award Group and a Mid-Tier SFC is executed between the Company and the Proposer, the NEP RFP Projection will be further evaluated at several steps throughout the process as set forth in the Mid-Tier SFC, and adjustments to the Lump Sum Payment will be made accordingly. Additionally, because the Company will rely on an accurate representation of the NEP RFP Projection in the RFP evaluation, a one-time liquidated damage as described in the Mid-Tier SFC will be assessed if the First NEP benchmark is less than the Proposer’s NEP RFP Projection. After the Facility has achieved commercial operations, the performance of the Facility will be assessed on a continuing basis against key metrics identified in the Mid-Tier SFC. See Article 2 and Attachment U of the Mid-Tier SFC.

value as it will become the RTE Performance Metric in Section 2.10 of the Mid-Tier SFC. Please review the Mid-Tier SFC for potential liquidated damages assessed against Seller if the BESS does not maintain the required RTE. The RTE is further specified in Appendix B Section 2.

- 3.10.3 Each Proposer must also agree to provide Project financial information, including proposed Project finance structure information specified in Appendix B. Such information will be used to evaluate Threshold Requirements and non-price criteria (e.g., Financial Viability of Proposer, Financial Strength and Financing Plan, State of Project Development and Schedule) set forth in Sections 4.3 and 4.4.2.
- 3.10.4 The Proposer agrees that no material changes or additions to the Facility from what is submitted in its Proposal will be made without the Proposer first having obtained prior written consent from the Company. Evaluation of all Proposals in this RFP is based on the information submitted in each Proposal at the Proposal Due Date. If any Proposer requests any Proposal information to be changed after that date, the Company, in consultation with the Independent Observer, and in consideration of whether the evaluation is affected, will determine whether the change is permitted.

3.11 Sites Identified by the Company

- 3.11.1 As an alternative to a Site identified by the Proposer, the Company has identified potential Sites where landowners have expressed a willingness to negotiate a lease or purchase of the land to support a renewable energy project. These Sites were identified through a Land RFI. Proposers will be responsible for working directly with the landowner and must secure Site Control with such landowner prior to submitting a Proposal. Land RFI information is available to interested parties who sign the CBRE NDA. The Land RFI is further described in Appendix F.

Proposers are not required to select a Site identified in the Land RFI and as noted above may propose any Site for a Project.

- 3.11.2 Additionally, a Company-owned Site is being offered to Proposers for their consideration. The available area is approximately 7.2 acres and comprised of 3 unique areas of approximately 5.7, 1.0, and 0.5 acres, each. The Company-owned site is within the Pala‘au Generating Station property west of Kaunakakai town, referred to as the Pala‘au Site, is further described in Appendix F. This is a different and unique site at the Pala‘au Generating Station property from what was offered in the Moloka‘i Variable Renewable Dispatchable Generation Paired with Energy Storage, issued on November 27, 2019.

Proposers proposing to use the Pala‘au Site shall be required to agree to specific terms and conditions for such use as provided for in Attachment K of the Mid-Tier SFC. Provisions providing for access to the site during construction and thereafter, during commercial operations, will be subject to current Company security policies and procedures, including any additional restrictions due to COVID 19. Physical, communication, and internet security will be required consistent with Company policy.

Additional measures may be required to limit or eliminate interference between Seller and Company facilities and infrastructure. Such policies, procedures, and requirements may change as necessary during the term of the Mid-Tier SFC to reflect changes in Company policies or to remain in compliance with current applicable laws, rules, or regulations. Limited sections of Attachment K (Company-Owned Sites) (Section 4 Seller's Investigations of the Company-Owned Site, Section 5 Construction and Maintenance, Section 7 Hazardous Substances, and Section 8 Archeological and Historic Items) shall be negotiable.

Due to COVID-19 travel restrictions, a site visit will not be available at this time. The Company will endeavor to provide as much information as possible to interested potential Proposers. Additional site information, beyond the details included in Appendix F, may be provided by the Company. Information on how to request such additional information, if available, will be posted on the Company's website.

3.12 Confidentiality

- 3.12.1 Each prospective Proposer must submit an executed CBRE NDA in the form attached as Appendix E by the Proposal Due Date specified in the RFP Schedule in Section 3.1. The form of the CBRE NDA is not negotiable and must be applicable to the Company whose System the Proposal is intended to connect to. Information designated as confidential by the Company will be provided on a limited basis, and only those prospective Proposers who have submitted an executed CBRE NDA will be considered. NDAs that were fully executed for prior non-CBRE RFPs will not be accepted. Proposers must clearly identify all confidential information in their Proposals. However, Proposers should designate as confidential only those portions of their Proposals that genuinely warrant confidential treatment. The Company discourages the practice of marking every page of a Proposal as confidential. The Company will make reasonable efforts to protect any such information that is clearly marked as confidential. Consistent with the terms of the CBRE NDA, the Company reserves the right to share any information, even if marked confidential, to its agents, contractors, or the Independent Observer for the purpose of evaluating the Proposal.
- 3.12.2 Proposers, in submitting any Proposal(s) to Company in response to this RFP, certify that such Proposer has not shared its Proposal(s), or any part thereof, with any other Proposer of a Proposal(s) responsive to this RFP.
- 3.12.3 The Company will request that the PUC issue a Protective Order to protect confidential information provided by Proposers to the Company and to be filed in a proceeding before the PUC. A copy of the Protective Order, once issued by the PUC, will be provided to Proposers. Proposers should be aware that the Company may be required to share certain confidential information contained in Proposals with the PUC, the State of Hawai'i Department of Commerce and Consumer Affairs, Division of Consumer Advocacy, and the parties to any docket instituted by the PUC, provided that recipients of confidential information have first agreed in writing to abide by the terms of the Protective Order. Notwithstanding the foregoing, no Proposer will be provided with Proposals from any

other Proposer, nor will Proposers be provided with any other information contained in such Proposals or provided by or with respect to any other Proposer.

3.13 Credit Requirements

- 3.13.1 Proposers with whom the Company enters into a Mid-Tier SFC must post Development Period Security and Operating Period Security in the form of an irrevocable standby letter of credit from a bank chartered in the United States as required and set forth in Article 14 of the Mid-Tier SFC. Cash, a parent guaranty, or other forms of security will not be accepted in lieu of the irrevocable standby letter of credit.
- 3.13.2 The Development Period Security and Operating Period Security identified in the Mid-Tier SFC are minimum requirements. Proposers shall not propose an amount lower than that set forth in the Mid-Tier SFC.
- 3.13.3 Each Proposer shall be required to provide a satisfactory irrevocable standby letter of credit in favor of the Company from a bank chartered in the United States to guarantee Proposer's payment of interconnection costs for all Company-Owned Interconnection Facilities in excess of the Total Estimated Interconnection Costs and/or all relocations costs in excess of Total Estimated Relocation Costs that are payable to Company as required and set forth in Attachment G to the Mid-Tier SFC.
- 3.13.4 Proposers may be required to provide an irrevocable standby letter of credit in favor of the Company from a bank chartered in the United States in lieu of the required Source Code Escrow in an amount and as required and set forth in Attachment B to the Mid-Tier SFC.

Chapter 4: Evaluation Process and Evaluation Criteria

4.1 Proposal Evaluation and Selection Process

The Company will employ a multi-step evaluation process. Once the Proposals are received, the Proposals will be subject to a consistent and defined review, evaluation, and selection process. This Chapter provides a description of each step of the process, along with the requirements of Proposers at each step. Figure 1 sets forth the flowchart for the proposal evaluation and selection process.

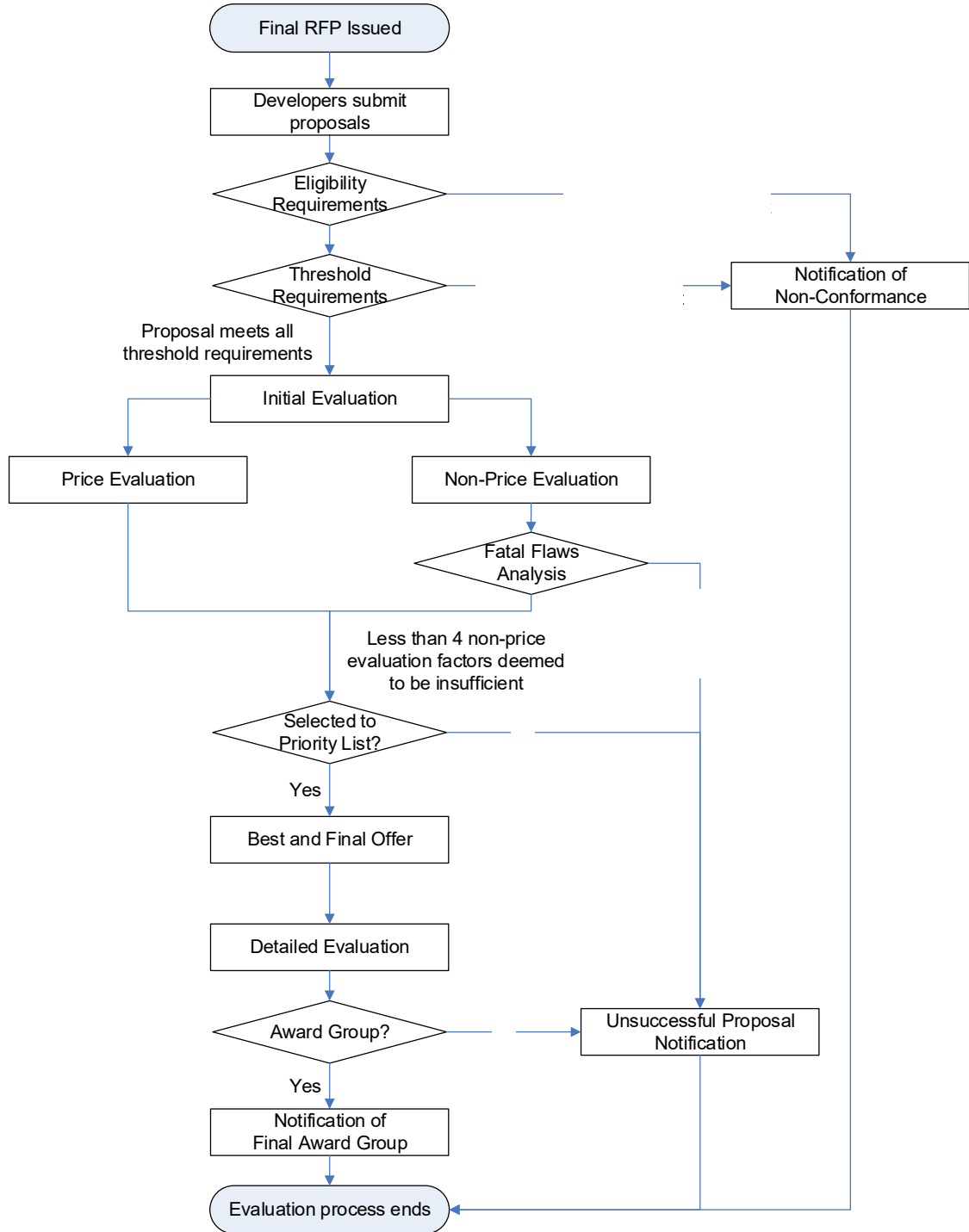
Upon receipt of the Proposals, the Company will review each Proposal submission to determine if it meets the Eligibility Requirements and the Threshold Requirements. The Company, in coordination with the Independent Observer will determine if a Proposer is allowed to cure any aspect of its Proposal or whether the Proposal would be eliminated

based on failure to meet either Eligibility or Threshold Requirements.¹³ If a Proposer is provided the opportunity to cure any aspect of its Proposal, the Proposer shall be given three (3) business days to cure from the date of notification to cure.¹⁴ Proposals that have successfully met the Eligibility and Threshold Requirements will then enter a two-phase process for Proposal evaluation, which includes the Initial Evaluation resulting in the development of a Priority List, followed by the opportunity for Priority List Proposals to provide Best and Final Offers, and then a Detailed Evaluation process to arrive at a Final Award Group.

¹³ As a general rule, if a Proposer does not include a requested document, inadvertently excludes minor information or provides inconsistencies in its information, it may be given a chance to cure such deficiency. If a Proposer fails to provide material required information in its Proposal and providing the Proposer an opportunity to cure is deemed by the Company, in consultation with the Independent Observer, as an unfair advantage to such Proposer, the Proposal could be classified as non-conforming and eliminated for failure to meet the Eligibility Requirements.

¹⁴ The initial request will be offered 3 business days to cure. Succeeding inquiries on the deficiencies will be offered cure periods deemed sufficient by the Company and Independent Observer.

Figure 1 – Evaluation Workflow



4.2 Eligibility Requirements Assessment

Upon receipt of the Proposals, each Proposal will be reviewed to ensure that it meets the following Eligibility Requirements.

- The Proposer is not eligible to participate in this RFP if the Proposer, its parent company, or an affiliate of the Proposer has:
 - defaulted on a current contract with the Company, or
 - had a contract terminated by the Company, or
 - any pending litigation in which the Proposer has made claims against the Company.
- The Proposal, including required uploaded files, must be received on time via the Electronic Procurement Platform.
- The Proposal Fee must be received on or before the Proposal Due Date.¹⁵
- The Proposal must not contain material omissions.
- The Proposal must be signed and certified by an officer or other authorized person of the Proposer.
- The Proposer must fully execute the CBRE NDA and any other document required pursuant to this RFP.
- The Proposer must provide a Certificate of Vendor Compliance from the Hawai‘i Compliance Express dated and issued within 60 days of the date of Proposal submission (a certificate of good standing from the State of Hawai‘i Department of Commerce and Consumer Affairs and also federal and Hawai‘i state tax clearance certificates for the Proposer may be substituted for the Certificate of Vendor Compliance).
- The Proposal must not be contingent upon changes to existing county, state, or federal laws or regulations.
- The proposed Project must be located on the island of Moloka‘i.
- The Proposal must be for a PV project paired with a BESS.
- The proposed Project must be 250 kW or larger.
- Projects interconnecting to a distribution circuit (12 kV or lower) must not exceed 250 kW.
- Projects interconnecting at the Pala‘au Generating Station must be 1 MW or larger, up to and including 2.5 MW.
- A minimum of 40% of the Subscriber portion of the Project must be dedicated to residential Subscribers as described in Section 1.2.3.
- No single point of failure from the Facility shall result in a decrease in net electrical output greater than 2.2 MW.
- Project infrastructure and point of interconnection must be located outside the 3.2 feet sea level rise exposure area (SLR-XA) as described in the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report (2017), and not located within a Tsunami Evacuation Zone.
- The Proposal must meet the grid-charging requirements of Section 1.2.13.
- The Proposal must specify a GCOD no later than August 31, 2026.

¹⁵ Proposal Fees will not be required for SBO Proposals.

- Proposals for projects that are 1 MW or greater must provide grid-forming and black start capabilities.
- The Proposer shall agree to post Development Period Security and Operating Period Security as described in Section 3.13.

4.3 Threshold Requirement Assessment

Proposals that meet all the Eligibility Requirements will then be evaluated to determine compliance with the Threshold Requirements, which have been designed to screen out Proposals that are insufficiently developed, lack demonstrated technology, or will impose unacceptable execution risk for the Company.

Proposals must provide explanations and contain supporting information demonstrating how and why the Project proposed meets each of the Threshold Requirements. Proposals that fail to provide this information or meet a Threshold Requirement will be eliminated from further consideration upon concurrence with the Independent Observer.

The Threshold Requirements for this RFP are the following:

1. **Site Control:** The Proposal must demonstrate that the Proposer has Site Control for all real property required for the successful implementation of a specific Proposal at a Site not controlled by the Company, including any Interconnection Facilities for which the Proposer is responsible. The need for a firm commitment is necessary to ensure that Proposals are indeed realistic and can be relied upon as the Company moves through the remainder of the RFP process. In addition, developmental requirements and restrictions such as zoning of the Site and the status of easements must be identified and will be considered in determining whether the Proposal meets the Site Control threshold.

To meet this Site Control requirement, Proposers must do one of the following:

- Provide documentation confirming (1) that the Proposer has an existing legally enforceable right to use and control the Site, either in fee simple or under leasehold for a term at least equal to the term of the Mid-Tier SFC (“Site Control”) as specified in the Proposer’s Proposal (taking into account the timelines set forth in this RFP for selection and execution of a Mid-Tier SFC and PUC approval as applicable), and (2) the applicable zoning for the Site and that such zoning does not prohibit the development of the Site consistent with the Proposal; or
- Provide documentation confirming, at a minimum, (1) that the Proposer has an executed binding letter of intent, memorandum of understanding, option agreement, or similar document with the land owner (a “binding commitment”) which sets forth the general terms of a transaction that would grant the Proposer the required Site Control, and (2) the applicable zoning for the Site and that such zoning does not prohibit the development of the Site consistent with the Proposal. The binding commitment does not need to be exclusive to the Proposer at the time the Proposal is submitted and may be contingent upon selection of the Proposal to the Final Award Group. If

multiple Projects are provided a binding commitment for the same Site, the documents granting the binding commitments must not prevent the Company from choosing the Proposal that otherwise would have been selected.

- **Government/Public Lands Only:** The above two bullet points may not be feasible where government or publicly-owned lands are part of the Site or are required for the successful implementation of the Proposal. In such a case, at a minimum the Proposer must provide a credible and viable plan, including evidence of any steps taken to date, to secure all necessary Site Control for the Proposal, including but not limited to evidence of sufficient progress toward approval by the government agency or other body vested with the authority to grant such approval (as demonstrated by records of the agency). The Proposer will still be required, however, to demonstrate Site Control as required in the Mid-Tier SFC should the Proposal be selected to the Final Award Group.
2. **Performance Standards:** The proposed Facility must be able to meet the performance attributes identified in this RFP and the Performance Standards identified in Section 2.1 of this RFP. Proposals should include sufficient documentation to support the stated claim that the Facility will be able to meet the Performance Standards. The Proposal should include information required to make such a determination in an organized manner to ensure this evaluation can be completed within the evaluation review period.
 3. **Proven Technology:** This criterion is intended as a check to ensure that the technology proposed is viable and can reasonably be relied upon to meet the objectives of this RFP. The Company will only consider Proposals utilizing technologies that have successfully reached commercial operations in commercial applications (i.e., a PPA) at the scale being proposed. Proposals should include any supporting information for the Company to assess the commercial and financial maturity of the technology being proposed.
 4. **Experience of the Proposer:** The Proposer, its affiliated companies, partners, and/or contractors and consultants on the Proposer's Project team must have experience in financing, designing, constructing, interconnecting, owning, operating, and maintaining at least one (1) electricity generation project, including all components of the project (i.e., BESS or other attributes), similar in size, scope, technology, and structure to the Project being proposed by Proposer. The Company will consider a Proposer to have reasonably met this Threshold Requirement if the Proposer can provide sufficient information in its Proposal's RFP Appendix B Section 2.13 tables demonstrating that at least one member of the Proposer's team (identified in the Proposal) has specific experience in each of the following categories: financing, designing, constructing, interconnecting, owning, operating, and maintaining projects similar to the Project being proposed.
 5. **Financial Compliance:** The proposed Project must not cause the Company to be subject to consolidation, as set forth in Financial Accounting Standards Board ("FASB") Accounting Standards Codification Topic 810, Consolidation ("ASC

810”), as issued and amended from time to time by FASB. Proposers are required to state to the best of their knowledge, with supporting information to allow the Company to verify such conclusion, that the Proposal will not result in the Seller under the PPA being a Variable Interest Entity (“VIE”) and result in the Company being the primary beneficiary of the Seller that would trigger consolidation of the Seller’s finances on to the Company’s financial statements under FASB ASC 810. The Company will perform a preliminary consolidation assessment based on the Proposals received. The Company reserves the right to allow a Proposal to proceed through the evaluation process through selection of the Priority List and work with the Proposer on this issue prior to or during contract execution. The Company has determined that for purposes of FASB ASC 842, a generation plus BESS facility will be treated as two separate measurements of account. For accounting purposes, the BESS portion (if applicable) will be treated as a lease, while the generation facility will not. As a result, no lease evaluation will be completed as part of the Proposal evaluation.

6. **Community Outreach:** Gaining community support is an important part of a Project’s viability and success. A comprehensive community outreach and communications plan (“Community Outreach Plan”) is an essential roadmap that guides a developer as they work with various communities and stakeholders to gain their support for a Project. Proposers must include a Community Outreach Plan that describes the Proposer’s commitment to work with the neighboring community and stakeholders and to provide them timely Project information during all phases of the Project. The Community Outreach Plan shall include, but not be limited to, the following information: Project description, community scoping (including stakeholders and community concerns), Project benefits, government approvals, development process (including Project schedule), and a comprehensive communications plan.
7. **Cultural Resource Impacts:** Proposers need to be mindful of the Project’s potential impacts to historical and cultural resources. Proposers must identify: (1) valued cultural, historical, or natural resources in the area in question, including the extent to which traditional and customary native Hawaiian rights are exercised in the area; (2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken to reasonably protect any identified cultural, historical, or natural resources in the area in question, and the reasonable protection of traditional and customary native Hawaiian rights in the affected area. Also, Proposers must have already contracted with a consultant with expertise in this field to begin a cultural impact plan for the Project.

4.4 Initial Evaluation – Price and Non-Price Analysis

Proposals that meet both the Eligibility and Threshold Requirements are Eligible Proposals which will then be subject to a price and non-price assessment. Two teams have been established to undertake the Proposal evaluation process: a Price Evaluation

Team and Non-Price Evaluation Team. The results of the price and non-price analysis will be a relative ranking and scoring of all Eligible Proposals. Price-related criteria will account for fifty-one percent (51%) of the total score and non-price-related criteria will account for forty-nine percent (49%) of the total score. The non-price criteria and methodology for applying the criteria are explained in Section 4.4.2.

The Company will employ a closed-bidding process for this solicitation in accordance with Part IV.H.3 of the Framework where the price and non-price evaluation models to be used will not be provided to Proposers. However, the Company will provide the Independent Observer with all necessary information to allow the Independent Observer to understand the evaluation models and to enable the Independent Observer to observe the entire analysis to ensure a fair process.

4.4.1 Initial Evaluation of the Price Related Criteria

For the initial price analysis, an avoided cost screening approach will be used to rank proposals. Using the forecast and planning assumptions developed for the Company's Integrated Grid Planning process and evaluation methodology proposed in the Solution Evaluation & Optimization Working Group, a resource portfolio will be developed using a capacity expansion model to identify proxy resources that serve the grid needs and inform their marginal avoided costs. For each Proposal, the avoided cost of each grid service would be multiplied by the expected ability of the Proposal to provide that service or others, and summed across the services to determine the potential benefit of the Proposal. The benefit would then be reduced by the Proposal cost and normalized by the NEP provided in the Proposal to calculate a Levelized Benefit ("LB") (\$/MWh).

The Company will conduct the comparative evaluation and award evaluation points to Proposals in accordance with the relative ranking based on LB. The Eligible Proposal with the highest LB will receive 510 points. All other Eligible Proposals will receive points based on a proportionate reduction using the percentage by which the Eligible Proposal's LB is lower than the highest LB. For example, if a Proposal's LB is ten percent (10%) lower than the highest LB, the Proposal will be awarded 459 points (that is, 510 points less 10%). The result of this assessment will be a ranking and scoring of the Proposals.

4.4.2 Initial Evaluation of the Non-Price Related Criteria

For the non-price analysis, each Proposal will be evaluated on each of the non-price criteria categories set forth below:

1. Community Outreach
2. State of Project Development and Schedule
3. Performance Standards
4. Locational Value for Community Resilience
5. Commitment to Residential Subscriber Participation
6. CBRE Program
7. Environmental Compliance and Permitting Plan
8. Experience and Qualifications

9. Financial Strength and Financing Plan
10. RESERVED
11. Guaranteed Commercial Operations Date
12. Cultural Resource Impacts

Each of the first six criteria – Community Outreach, State of Project Development and Schedule, Performance Standards, Locational Value for Community Resilience, Commitment to Residential Subscriber Participation, and CBRE Program – will be weighted twice as heavily as the others to reflect the impact these categories have to achieve a successful and timely procurement. The non-price criteria are generally scored on a scale of 1 (poor) to 5 (highly preferable). A score of 3 means that a Proposal meets the minimum standard for that criteria.

The total non-price score will be the sum of the scores for each of the individual non-price criteria. The Company will then award non-price evaluation points in accordance with the relative ranking of scores. The Proposal with the highest total non-price score will receive 490 points, and all other Proposals will receive points equal to the Proposal's score divided by the top score, multiplied by 490.

During the non-price criteria evaluation, a fatal flaws analysis will also be conducted such that any Proposal that is deemed not to meet the minimum standards level of at least five (5) non-price criteria will be disqualified given that the Proposal has failed to meet the required number of non-price factors that are indicative as to the general feasibility and operational viability of a proposed Project. Non-price criteria numbers 4, 5 and 11 above will be excluded from the fatal flaws analysis.

The Company's evaluation of the non-price criteria will be based on the materials provided by a Proposer in its Proposal. Acceptance of any Proposal into the Final Award Group shall not be assumed or construed to be an endorsement or approval that the materials provided by Proposer are complete, accurate or in compliance with applicable law. The Company assumes no obligation to correct, confirm, or further research any of the materials submitted by Proposers. Proposers retain sole responsibility to ensure their Proposals are accurate and in compliance with all laws.

The non-price criteria are:

1. **Community Outreach** – Gaining community support is an important part of a Project's viability and success. An effective Community Outreach Plan will call for early meaningful communications with stakeholders and will reflect a deep understanding and respect for the community's desire for information to enable them to make informed decisions about future projects in their communities. Therefore, Proposals will be evaluated on the quality of the Community Outreach Plan to inform the Project's impacted communities.

Proposals should include a Community Outreach Plan that describes the Proposer's commitment to work with the neighboring community and stakeholders and to provide timely Project information during Project

development, construction and operation. The Community Outreach Plan shall include, but not be limited to the following:

- 1) Project description. A thorough description including a map of the location of the Project. This information will help the community understand the impact that the Project may have on the community.
- 2) Community scoping. Identify stakeholders (individuals, community leaders, organizations), community issues and concerns, and community sentiment.
- 3) Project benefits. An explanation of the need for the Project. This will help the community to understand how the Project might benefit their community.
- 4) Government approvals. Required government permits and approvals, public hearings and other opportunities for public comment. This information will help the community to understand the level of public scrutiny and participation that might occur for the Project and the opportunities to provide public comments.
- 5) Development process. A Project schedule that identifies key milestones will facilitate the community's understanding of the development process.
- 6) Communications Plan. A communications plan including a detailed community outreach schedule that will keep the affected communities and stakeholders informed about the Project's outreach efforts during early Project development period through construction and operations.

Preference will be given to Proposers who have already identified established contacts to work with the local community, have used community input to incorporate changes to the final design of the Project and mitigate community concerns, have proposed a community benefits package (including details of the community recipients and benefits package), or have community consultants as part of the Project team doing business in Hawai'i that have successfully worked with communities in Hawai'i on the development of two or more energy projects or projects with similar community issues. These criteria are aligned with the Company's community engagement expectation whereby all developers will be required to engage in community outreach prior to signing a PPA with the Company. This process is also outlined in RFP Section 5.3. Further information and instructions regarding expectations for the Community Outreach Plan are included as Attachment 4 and 5 to Appendix B.

2. **State of Project Development and Schedule** – Projects that are further along in development generally have lower project execution risk and a greater probability of being able to be successfully placed into service prior to the GCOD (specifically identified in each Proposal). At a minimum, Projects should demonstrate how they plan to capture any ITC safe harbor and reach their GCOD specified, including identification of risks and schedule assumptions. (Schedules must identify the IRS completion date and PUC approval dates assumed.) Proposals should also demonstrate, via a detailed critical path schedule, that there is a high likelihood that the Project will be able to reach commercial operations as

specified. Proposals shall include a Gantt chart that clearly illustrates the overall schedule and demonstrates achievement of any ITC safe harbor, if applicable, and commercial operations by their specified GCOD. The Gantt chart shall include task durations and dependencies, identify tasks that will be fast tracked, and identifies slack time and contingencies. This criterion will also look at the high-level Project costs set forth in the Proposal including: costs for equipment, construction, engineering, Seller-Owned Interconnection Facilities, Company-Owned Interconnection Facilities, land, annual O&M, the reasonableness of such costs and the assumptions used for such costs. Project costs that do not appear reasonable for a project of the size proposed may result in a lower ranking for this criterion if the Company reasonably determines that the cost information is unrealistic based on prior experience in the market which may result in a risk that the Project can be built on time and for the price proposed by the Proposer. The Company reserves the right to discuss any cost and financial information with a Proposer to ensure the information provided is accurate and correct.

3. **Performance Standards** – The proposed Facility must be able to meet the performance attributes identified in this RFP and the Performance Standards identified in the Mid-Tier SFC. The Company will review the Proposal information received, including design documents and operating procedures materials provided in the Proposal, and evaluate whether the Project as designed is able to meet the Performance Standards identified in the Mid-Tier SFC and in this RFP. At a minimum, in addition to meeting the Performance Standards, the Proposal should include sufficient documentation, provided in an organized manner, to support the stated claim that the Facility will be able to meet the Performance Standards. The Proposal should include information required to make such a determination in an organized manner to ensure this evaluation can be completed on a timely basis. Preference will be given to Proposals that provide detailed technical and design information showing how each standard can be met by the proposed Facility. Preference will also be provided on facilities that offer additional capabilities.
4. **Locational Value for Community Resilience** – The Company has identified that CBRE projects have the potential to support community resilience. For Projects to support community resilience, a BESS with grid-forming and black start capability is needed. Proposals should provide a description of the critical infrastructure or community resilience hubs in proximate location to the proposed Project site that could benefit from the islanding capabilities of the proposed Project.
5. **Commitment to Residential Subscriber Participation** – Proposals will be evaluated on the stated commitments of the Project’s Subscriber Organization to residential Subscribers. At a minimum, Subscriber Organizations will be required to set aside 40% of the Project’s capacity for residential Subscribers. Proposers that commit to reserving a portion larger than 40% of their Project capacity for residential Subscribers will be given more favorable scoring. In addition,

Proposals will also be evaluated on the stated commitments of the Project's Subscriber Organization to LMI Customers. Proposers that commit to reserving a portion of the Project's capacity for LMI Customers will be given more favorable scoring.

6. **CBRE Program** – Proposals will be evaluated on several facets of the CBRE program being proposed.
 - 1) **Program Offering:** Proposals will be evaluated to give preference to program offerings that provide the most benefits to residential and LMI Customers, as applicable. Financing options, upfront fees, payment over time, public funding options, and other creative approaches will be preferred along with programs that offer higher expected customer level savings, favorable payback periods and mechanisms, and other customer benefits. In addition, Proposals shall describe the extent to which residential Subscribers will be financially responsible for the Facility's underperformance.
 - 2) **Marketing and Outreach Plans:** Proposals will be evaluated on the proposed strategies and methods to educate, inform, and stimulate the market in order to achieve their target levels of participation.
 - 3) **Program Experience:** Proposals will also be evaluated on Proposers documented success in reaching and retaining participation of residential and LMI Customers, as applicable, in other community-based renewable energy programs.
7. **Environmental Compliance and Permitting Plan** – This criterion relates to the potential (short- and long-term) environmental impacts associated with each project, the quality of the plan offered by the Proposer to mitigate and manage any environmental impacts (including any pre-existing environmental conditions), and the plan of Proposers to remain in environmental compliance over the term of the contract. These impacts are reflected on a technology-specific basis. Completing any necessary environmental review and obtaining the required permitting in a timely manner is also important and Proposals will be evaluated on their plan to identify, apply for, and secure the required permits for the Project, any permitting activity that has been completed to date, including having initial discussions with the applicable regulating agencies such as U.S. Fish and Wildlife and the State of Hawai'i Department of Land and Natural Resources' Division of Forestry and Wildlife, prior to submitting a Proposal, and the degree of certainty offered by the Proposer in securing the necessary permits.

At a minimum, proposed Projects should be expected to have minimal environmental impact for most areas and Proposals should provide a comprehensive plan to mitigate the identified potential or actual significant environmental impacts to remain in environmental compliance. The proposed mitigation plans should be included in the Project timeline. Preference will be

given to Proposals that provide a more detailed plan as well as those that have proactively taken steps to mitigate potential environmental impacts.

Also, this criterion requires that, at a minimum, Proposers should have identified, and disclosed in their Proposal(s) all major permits, approvals, appurtenances and entitlements (including applicable access, rights of way and/or easements) (collectively, the “permits”) required and have a preliminary plan for securing such permits. Preference will be given to Proposals that are able to provide a greater degree of certainty that its plan to secure the required permits is realistic and achievable, or have already received all or a majority of the required permits. The Proposer should disclose all identified (a) discretionary permits required, i.e., those requiring public or contested case hearings and/or review and discretionary approval by an appropriate government agency and (b) ministerial conditions without discretionary approval conditions. In all cases, the Proposer must provide a credible and viable plan to secure all necessary and appropriate permits necessary for the project. For example, if the project is located within an agricultural district, the Proposer shall provide evidence of Proposer’s verification with the appropriate government agency that the project complies with HRS Section 205-2 and Section 205-4.5, relating to solar energy facilities placed on agricultural land, provided, however that where a special use permit (under Section 205-6), exemption (under Section 205-6), or amendment to land use district boundary lines (under Section 205-4) is required to secure such compliance, Proposer shall identify the need for such permit, exemption or amendment and provide a list of required prerequisites and/or conditions and a realistic timeline necessary to obtain such permit, exemption or amendment satisfactory for Proposer to still meet its designated Guaranteed Commercial Operations Date.

8. **Experience and Qualifications** – Proposals will be evaluated based on the experience of the Proposer in financing, designing, constructing, interconnecting, owning, operating, and maintaining projects (including all components of the project) of similar size, scope and technology. At a minimum, Proposals must show via the table format specified in RFP Appendix B Section 2.13 that at least one (1) member must have specific experience in each of the following categories: financing, designing, constructing, interconnecting, owning, operating, and maintaining at least one electricity generation project including all components of the project similar to the Project being proposed. Preference will be given to Proposers with experience in successfully developing multiple projects that are similar to the one being proposed and/or that have prior experience successfully developing and interconnecting a utility scale project to the Company’s System.
9. **Financial Strength and Financing Plan** – This criterion addresses the comprehensiveness and reasonableness of the financial plan for the Project as well as assesses the financial strength and capability of the Proposer to develop the Project. A complete financial plan addresses the following issues: Project ownership, capital cost and capital structure, sources of debt and equity, and

evidence that credit-worthy entities are interested in financing the Project. The financial strength of Proposers or their credit support providers will be considered, including their credit ratings. The financing participants are expected to be reasonably strong financially. Developers and their sources of capital that have investment grade credit ratings from a reputable credit rating agency (S&P, Moody's, Fitch) will also be given preference, with those that have higher credit ratings ranked higher.

10. RESERVED

11. **Guaranteed Commercial Operations Date** – Proposers that are able to design for and commit to an earlier GCOD will be given more favorable scoring. Proposers will be held to the GCOD identified in their Proposal. The GCOD will be a Guaranteed Milestone and will be inserted without amendment into the Mid-Tier SFC, as applicable.

12. **Cultural Resource Impacts** – Proposers need to be mindful of the Project's potential impacts to historical and cultural resources. Proposers should have identified (1) valued cultural, historical, or natural resources in the area in question, including the extent to which traditional and customary native Hawaiian rights are exercised in the area; (2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken to reasonably protect any identified cultural, historical, or natural resources in the area in question, and the reasonable protection of traditional and customary native Hawaiian rights in the affected area.

Also, Proposers should have already contracted with a consultant with expertise in this field to begin a cultural impact plan for the Project. Proposals will be evaluated on the commitment to addressing cultural resource impacts on their Project, if any. Therefore, in order to be evaluated for this criterion, Proposers should, at least, provide the following documentation, as applicable: 1) Proposer's or its consultant's experience with cultural resource impacts on past projects; 2) the status of their cultural impact plan. Proposals will be evaluated on the extent to which their cultural impact plan has been developed, and preference will be given to Proposals that are further along in the process, including but not limited to, whether a mitigation/action plan has been provided that addresses any identified cultural resource issues, or a date for when such a plan will be available has been identified, or any portions of such plan have been completed.

4.5 Selection of a Priority List

At the conclusion of both the price and non-price analysis, a total score will be calculated for each Proposal using the 51% price-related criteria / 49% non-price-related criteria weighting outlined above. The price and non-price analysis, and the summation of both price and non-price scores described above, will result in a ranking of Proposals.

The Company will determine a Priority List from the highest scoring Proposals. The Company will develop the Priority Lists in consultation with the Independent Observer. The Company reserves the right, in consultation with the Independent Observer, to limit the projects allowed for further consideration in the initial evaluation to projects that fall within 15% of the highest Levelized Benefit. Selection to the Priority List does not assure an eligible Project's inclusion in the selection of the Final Award Group.

4.6 Best and Final Offer (BAFO)

4.6.1 The Company will solicit a Best and Final Offer from Proposers selected to the Priority List. If the SBO is selected to the Priority List, the SBO will not be eligible to provide a Best and Final Offer and the original pricing submitted in its Self-Build Proposal will be used in the Detailed Evaluation. All other Proposers selected to the Priority List will have the opportunity to update (downward only)¹⁶ the pricing elements in their Proposal in order to improve the competitiveness of their Proposal prior to being further assessed in the Detailed Evaluation phase. At this point in the process, updates may only be made to the following pricing elements:

- Lump Sum Payment (\$/year) amount

Proposers will not be allowed to increase their price¹⁷ but may elect to maintain the same pricing submitted in their original Proposal. Proposers will not be allowed to make any other changes to their Proposal during the Best and Final Offer.

4.6.2 If a Proposer does not propose improvements to their pricing elements during the Best and Final Offer solicitation, the original Proposal pricing elements will be deemed its Best and Final Offer.¹⁸

4.7 Detailed Evaluation

The Best and Final Offers of the Priority List Proposals as well as any original Self-Build Proposals, if advanced to the Priority List, will be further assessed in the Detailed Evaluation to identify the Proposals selected to the Final Award Group.

The detailed evaluation process will consist of assessment of combinations of Proposals from the Priority List. A capacity expansion model will use the same assumptions as in the Initial Evaluation but replace the generic resource costs and performance characteristics with the specific costs and performance characteristics of the Projects. Due to computational limitations, all Proposals from the Priority List may not be evaluated simultaneously. The ranking developed in the Initial Evaluation can be used to

¹⁶ Proposers will only be allowed to adjust pricing elements downward. No upward adjustment to the pricing elements will be permitted or considered. All other characteristics of the Proposal and Facility capabilities must remain valid and unchanged (e.g., NEP, GCOD, etc.)

¹⁷ Proposers will not be allowed to increase the pricing in their Proposals to address interconnection and/or system upgrade costs or for any other reason.

¹⁸ The Company reserves the right, in consultation with the Independent Observer, to adjust the parameters of the BAFO, in the unlikely event that system needs have evolved in a way that the Proposals received do not fully address.

screen the Proposals in the Detailed Evaluation to those that provide the highest potential benefit to the system. A production simulation model will then be used to provide a feasibility check on the final resource portfolio of Projects.

The evaluation will evaluate the benefits and costs of integrating the Project or combination of Projects onto the Company's System which includes:

1. The cost to dispatch the Project or combination of Projects and the energy and storage purchased;
2. The fuel cost savings (benefits) and any other direct savings (IPP savings from dispatchable fossil fuel savings, where applicable) resulting from the displacement of generation by the Priority List Proposals, including consideration of round-trip efficiencies for facilities with a BESS;
3. The estimated increase (or decrease) in operating cost, if any, incurred by the Company to maintain system reliability; and
4. The cost of imputed debt, if applicable.

As noted, the Company will take into account the cost of rebalancing its capital structure resulting from any debt or imputed debt impacts associated with each Proposal (including any costs to be incurred by the Company, as described above, that are necessary in implementing the Proposal). The Company proposes to use the imputed debt methodology published by S&P that is applicable to the Proposal being evaluated. S&P views long-term PPAs as creating fixed, debt-like financial obligations that represent substitutes for debt-financed capital investments in generation capacity. By adjusting financial measures to incorporate PPA-fixed obligations, greater comparability of utilities that finance and build generation capacity and those that purchase capacity to satisfy new load are achieved.

During the Detailed Evaluation and before the Proposals advance to the Final Award Group, the Company will perform load flow analyses to determine if certain Projects or combinations of Projects introduce circuit constraints that will factor into the selection process. This is to address the possibility that even though sufficient line capacity was identified for an individual Project, Projects that are in close proximity with each other could introduce additional circuit constraints. The Projects selected must not have any additional constraints imposed based on the Load Flow Analysis to advance to the Final Award Group. However, the Company reserves the right, in consultation with the Independent Observer, to allow minor modifications (i.e., downsize project) to a Proposal to avoid such additional constraints. If such modification resulted in a reduced size of the Facility, the pricing proposed would also need to be revised. Under no circumstances would a Proposer be allowed to increase their price as a result of such minor modification.

Also in the Detailed Evaluation, other factors will be validated to ensure that the final combination of Projects provides the contemplated benefits that the Company seeks. The Company will evaluate the collateral consequences of the implementation of a

combination of Projects, including consideration of the geographic diversity, resource diversity, interconnection complexity, and flexibility and latitude of operation control of the Projects.

The Company may assess additional combinations of Projects if requested by the Independent Observer and if the time and capability exist to perform such analyses.

Projects interconnecting to distribution circuits may be subject to the Technical Review process of Rule 14H. The Company may consider a Project's performance through this process in the Detailed Evaluation.

4.8 Selection of the Final Award Group

Based on the results of the Detailed Evaluation and review of the results with the Independent Observer, the Company will select a Final Award Group. Mid-Tier Projects selected to the Final Award Group will execute a Mid-Tier SFC with the Company in the form of Appendix K. All Proposers will be notified at this stage of the evaluation process whether their Proposal is included in the Final Award Group.

Selection to the Final Award Group does not guarantee execution of a Mid-Tier SFC.

Further, if at any time during the evaluation process it is discovered that a Proposer's Proposal contains incorrect or misrepresented information that has a material effect on any of the evaluation processes, including selection of the Priority List or the Final Award Group, the Company reserves the right, in consultation with the Independent Observer, to disqualify the Proposer from the RFP.

Following any removal of a proposal from the Final Award Group, either by disqualification noted immediately above, or via any other removal or withdrawal of a proposal, including failure to reach agreement to the Mid-Tier SFC, the Company, taking into consideration the timing of such removal and the current status of the Company's needs under the RFP, in consultation with and concurrence from the Independent Observer, will review the Priority List to determine (1) if another proposal should be added to the Final Award Group; or (2) if the remaining proposals in the Final Award Group should remain unchanged.

Chapter 5: Post Evaluation Process

5.1 Project Interconnection Process

5.1.1 Interconnection Modeling Process

A summary of the model requirements and impact study scope can be found in Appendix B, Attachment 6.

For all projects sized at 250 kW, Project single line and three line diagrams and an equipment list shall be submitted for each Proposal. For all projects greater than or equal to 1 MW in size (regardless of whether an IRS is required), a complete package of

Project Interconnection Data Request worksheets, Project single line and three line diagrams, models for equipment and controls, list(s) to clearly identify the components and respective files (for inverters and power plant controller), and complete documentation with instructions shall be submitted with each Proposal within 30 days after selection to the Final Award Group (see Section 2.11 of Appendix B).

If required for the project (see Appendix B, Attachment 6), PSSE Generic models, PSSE User models, and ASPEN models shall be configured to represent all of the functional equipment with settings in place to comply with the Company's performance requirements. These must be checked for functionality by the Proposer or its vendors and consultants prior to submission to the Company. Similarly, fully accurate PSCAD models shall be submitted in a condition that complies with the PSCAD modeling guidelines provided by the Company. Overlaid validation plots of PSSE Generic models, PSSE User models, and PSCAD models shall be submitted as described in the Project Interconnection Data Request worksheets to ensure compatible responses from each model.

If the Company determines that an IRS is not required, the Company will provide an Interconnection Modeling Letter Agreement for each selected Project, with a statement of required deposit for individual work for: (a) a technical model checkout for each project, and (b) any considerations that are specific to a particular project and location. After proposals and models are submitted, the Company will inspect the data packages for general completeness. For any incomplete submissions, a list of missing or non-functional items will be provided. Proposers will be given 15 Days to resolve data and modeling deficiencies. The Company, in consultation with the Independent Observer, may remove Proposals if their submission requirements are deemed incomplete for the lack of requested models and validation plots.

The technical model checkouts will be conducted first. Upon identification of any functional problems or deficiencies, corrective action shall be taken immediately and on an interactive basis so that the problems or deficiencies can be resolved within 15 Days, including re-submission of data and updated models, or the Project shall be deemed withdrawn. At the discretion of the Company and provided that there is a demonstration of good faith action to minimize delay that would affect the schedule, a second round of model checkout and problem solving may proceed. Thereafter, any notice that a Project is deemed withdrawn for lack of completeness shall be final. Subject to consultation with the Independent Observer, failure to provide all requested material within the time(s) specified, or changes to the data provided after the due date(s), shall result in elimination from consideration.

5.1.2 Interconnection Requirements Study Process

The Detailed Evaluation process or Appendix III of Rule 14H shall determine the need for an IRS. Upon notification of selection to the Final Award Group, and subject to Rule 14H, the Company will provide an IRS Letter Agreement (in lieu of an Interconnection Modeling Letter Agreement) for each selected project, with a statement of required deposit for individual and prorated work as part of an IRS Scope for: (1) a System Impact

Study that will involve (a) technical model checkout for each project, (b) any considerations that are specific to a particular project and location, and (c) system impact analyses of the projects as a group; and (2) a Facility Study that includes the Interconnection cost and schedule, including cost of any required system upgrades. After proposals and models are submitted, the Company will inspect the data packages for general completeness. For any incomplete submissions, a list of missing or non-functional items will be provided. Proposers will be given 15 Days to resolve data and modeling deficiencies. The Company, in consultation with the Independent Observer, may remove Proposals if their submission requirements are deemed incomplete for the lack of requested models and validation plots.

The technical model checkouts will be conducted first. Upon identification of any functional problems or deficiencies, corrective action shall be taken immediately and on an interactive basis so that the problems or deficiencies can be resolved within 15 Days, including re-submission of data and updated models, or the Project shall be deemed withdrawn. At the discretion of the Company and provided that there is a demonstration of good faith action to minimize delay that would affect the schedule, a second round of model checkout and problem solving may proceed. Thereafter, any notice that a Project is deemed withdrawn for lack of completeness shall be final. Subject to consultation with the Independent Observer, failure to provide all requested material within the time(s) specified, or changes to the data provided after the due date(s), shall result in elimination from consideration.

Proposers shall be responsible for the cost of the IRS, under separate agreements for the System Impact Study and the Facility Study. The overall IRS will provide information including, but not limited to, an estimated cost and schedule for the required Interconnection Facilities for a particular Project and any required mitigation measures. Proposers will be responsible for the actual final costs of all Seller-Owned Interconnection Facilities and Company-Owned Interconnection Facilities. Upon reviewing the results of the IRS, Detailed Evaluation or Technical Review process, if required, pursuant to Rule 14H, Appendix III, Proposers will have the opportunity to declare the Mid-Tier SFC null and void in the event that the estimated interconnection costs and schedule for the Project are higher than what was estimated in the Project Proposal.

5.2 Contract Execution Process

Within five (5) business days of being notified by the Company of its intent to execute a Mid-Tier SFC, Proposers selected for the Final Award Group will be required to indicate, in writing to the Company's primary contact for this RFP, whether they intend to proceed with their Proposals. Proposers who elect to remain in the Final Award Group will be required to keep their Proposal valid through the award period.

The Company intends to execute the Mid-Tier SFC and later amend the Mid-Tier SFC to include the results of the IRS.

5.3 Community Outreach and Engagement

The public meeting and comment solicitation process described in this section and Section 28 of the Mid-Tier SFC (Community Outreach) do not represent the only community outreach and engagement activities that can or should be performed by a Proposer.

The Company will publicly announce the Final Award Group no more than five (5) business days after the notification is given to Proposers who are selected to the Final Award Group. Selected Proposers shall not disclose their selection to the public before the Company publicly announces the Final Award Group selection.

On the next business day after the Company notifies a Proposer they were selected, each Proposer shall provide the Company with links to their Project website, which the Company will post on the Company's website. Each Proposer will launch a Project website that will go-live on the day the Company publicly announces the Final Award Group selection. Information on what should be included on the Project website is identified in Appendix B.

Within five (5) business days of notification of selection to the Final Award Group, Proposers must provide the Company with an updated comprehensive Community Outreach Plan to work with and inform neighboring communities and stakeholders and to provide them timely information during all phases of the Project. The Community Outreach Plan shall include but not be limited to the following information: Project description, Project stakeholders, community concerns and Proposer's efforts to address such concerns, Project benefits, government approvals, Project schedule, and a comprehensive communications plan. The Proposer's Community Outreach Plan shall be a public document identified on the Proposer's Project website for the term of the Mid-Tier SFC and made available to the public upon request. As an option, Proposers may provide their updated Community Outreach Plan and website information to the Company for review and feedback. If provided at least 30 days prior to the dates required, the Company will endeavor to review such information and provide feedback on the information before it is made available to the public. Details on the Community Outreach Plan can be found in Appendix B, Attachments 4 and 5.

Prior to the execution date of the Mid-Tier SFC, Proposers shall also host a public meeting in the community where the proposed Project is to be located for community and neighborhood groups in and around the vicinity of the Project Site that provided the neighboring community, stakeholders and the general public with: (i) a reasonable opportunity to learn about the proposed Project, and (ii) an opportunity to engage in a dialogue about concerns, mitigation measures, and potential community benefits of the proposed Project. The Proposer shall collect all public comments, and then provide the Company copies of all comments received in their original, unedited form. Proposers shall notify the public at least three weeks in advance of the meeting. The Company shall be informed of the meeting. The Company has provided Proposers with detailed instructions regarding the community meeting requirement after the selection of the Final Award Group (Attachment 4 to Appendix B). (For example, notice will be published in

county and regional newspapers/media, as well as media with statewide distribution. The Proposer will be directed to notify certain individuals and organizations. The Proposer will be provided templates to use for the public meeting notices, agenda, and presentation.) Proposers must also comply with any other requirement set forth in the Mid-Tier SFC relating to Community Outreach.

The Proposer shall be responsible for community outreach and engagement for the Project, and that the public meeting and comment solicitation process described in this section do not represent the only community outreach and engagement activities that can or should be performed.

5.4 RESERVED

5.5 PUC Approval

Selected Mid-Tier Projects will execute a Mid-Tier SFC with the Company which will not be subject to further regulatory review and approval. SBO proposals that are 250 kW or greater, up to and including 2.5 MW will also not be required to submit an additional application pursuant to General Order No. 7, but the Commission will hold the bidding utility to the terms of its bid, similar to an independent power producer.

5.6 Facility In-Service

In order to facilitate the timely commissioning of the projects selected through this RFP, the Company requires the following be included with the 60% design drawings: relay settings and protection coordination study, including fuse selection and ac/dc schematic trip scheme.

For the Company to test the Facility, coordination between the Company and Project is required. Drawings must be approved by the Company prior to testing. The entire Facility must be ready for testing to commence. Piecemeal testing will not be allowed. Communication infrastructure and equipment must be tested by the IPP and ready for operation prior to Company testing.

If approved drawings are not available, or if the Facility is otherwise not test ready as scheduled, the Project may lose its place in the queue, with the Company retaining the flexibility to adjust scheduling as it sees fit. If tests are not completed within the allotted scheduled testing time, the Project will be moved to the end of the Company's testing queue. The IPP will be allowed to cure if successful testing is completed within the allotted scheduled time. No adjustments will be made to the Mid-Tier SFC milestones if tests are not completed within the original allotted time. Liquidated damages for missed milestones will be assessed pursuant to the Mid-Tier SFC.

DRAFT
REQUEST FOR PROPOSALS
FOR
COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

March 30, 2021

Docket No. 2015-0389

Appendix A – Definitions



**Maui
Electric**

“Affiliate” means any person or entity that possesses an “affiliated interest” in a utility as defined by section 269-19.5, Hawaii Revised Statutes (“HRS”), including a utility’s parent holding company but excluding a utility’s subsidiary or parent which is also a regulated utility.

“Allowed Capacity” has the meaning set forth in the Mid-Tier SFC.

“Battery Energy Storage System” or “BESS” has the meaning set forth in the Mid-Tier SFC.

"BESS Contract Capacity" has the meaning set forth in the Mid-Tier SFC.

“Best and Final Offer” or “BAFO” means the final offer from a Proposer, as further described in Section 4.6 and elsewhere in this RFP.

“CBRE NDA” means the Mutual Confidentiality and Non-Disclosure Agreement attached to this RFP as Appendix E.

“Code of Conduct” means the code of conduct approved by the PUC in Docket No. 03-0372 (Decision and Order No. 23614, August 28, 2007) with respect to a Self-Build Option. An updated code of conduct was submitted to the PUC in Docket No. 2015-0389 on July 9, 2020.

“Code of Conduct Procedures Manual” or “Procedures Manual” means the manual approved by the PUC, which was put in place to address and to safeguard against preferential treatment or preferential access to information in a Hawaiian Electric, Maui Electric, or Hawaii Electric Light RFP process. The Procedures Manual is attached as Appendix C to this RFP.

“Commercial Operations” has the meaning set forth in the Mid-Tier SFC.

“Community Outreach Plan” is a community outreach and communication plan described in Section 4.3 and 4.4.2 of this RFP.

“Company” means Maui Electric Company, Ltd., a Hawai‘i corporation.

“Company-Owned Interconnection Facilities” has the meaning set forth in the Mid-Tier SFC.

“Competitive Bidding Framework” or “Framework” means the Framework for Competitive Bidding contained in Decision and Order No. 23121 issued by the Public Utilities Commission on December 8, 2006, and any subsequent orders providing for modifications from those set forth in Order No. 23121 issued December 8, 2006.

“Consumer Advocate” means the Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs of the State of Hawai‘i.

“Day” means a calendar day, unless the term “business day” is used, which means calendar day excluding weekends and federal and State of Hawai‘i holidays.

“Development Period Security” has the meaning set forth in Section 14.2 of the Mid-Tier SFC.

“Dispatchable” means the ability to turn on or turn off a generating resource at the request of the utility’s system operators, or the ability to increase or decrease the output of a generating resource from moment to moment in response to signals from a utility’s Automatic Generation Control System, Energy Management System or similar control system, or at the request of the utility’s system operators.

“Electronic Procurement Platform” means the third-party web-based sourcing platform that will be used for the intake of Proposals and associated electronic information, storage and handling of Proposer information, and communication.

“Eligibility Requirements” has the meaning set forth in Section 4.2 of this RFP.

“Eligible Proposals” means Proposals that meet both the Eligibility and Threshold Requirements.

“Energy Contract Manager” is the primary Company contact for this RFP.

“Evaluation Team” means agents of the Company who evaluate Proposals.

“Facility” has the meaning set forth in the Mid-Tier SFC.

“Facility Study” means a study to develop the interconnection facilities cost and schedule estimate including the cost associated with the design and construction of the Company-owned interconnection facilities.

“Final Award Group” means the group of Proposers selected by the Company from the Priority List, with which the Company will begin contract negotiations, based on the results of the Company’s detailed evaluation.

“Greenhouse Gas” or “GHG” are gases that contribute to the greenhouse gas effect and trap heat in the atmosphere.

“Guaranteed Commercial Operations Date” or “GCOD” means the date on which a Facility first achieves Commercial Operations.

“Hawaiian Electric” means Hawaiian Electric Company, Inc., a Hawai‘i corporation.

“Hawaiian Electric Companies” or “Companies” means Hawaiian Electric Company, Inc. and its subsidiaries, Hawaii Electric Light Company, Inc. and Maui Electric Company, Limited.

“HRS” means the Hawai‘i Revised Statutes as of the date of this Request for Proposals.

“Imputed Debt” means adjustments to the debt amounts reported on financial statements prepared under generally accepted accounting principles (“GAAP”). Certain obligations do not meet the GAAP criteria of “debt” but have debt-like characteristics; therefore, credit rating agencies “impute debt and interest” in evaluating the financial ratios of a company.

“Independent Observer” has the meaning set forth in Section 1.4 of this RFP.

“Independent Power Producer” or “IPP” means an entity that owns or operates an electricity generating facility that is not included in the Company’s rate base.

“Interconnection Facilities” means the equipment and devices required to permit a Facility to operate in parallel with, and deliver electric energy to, the Company System (in accordance with applicable provisions of the Commission’s General Order No. 7, Company tariffs, operational practices, interconnection requirements studies, and planning criteria), such as, but not limited to, transmission and distribution lines, transformers, switches, and circuit breakers. Interconnection Facilities includes Company-Owned Interconnection Facilities and Seller-Owned Interconnection Facilities.

“Interconnection Requirements Study” or “IRS” means a study, performed in accordance with the terms of the IRS Letter Agreement, to assess, among other things, (1) the system requirements and equipment requirements to interconnect the Facility with the Company System, (2) the Performance Standards of the Facility, and (3) an estimate of interconnection costs and project schedule for interconnection of the Facility.

“kV” means kilovolt.

“Land RFI” refers to a Request for Information activity conducted by the Company to identify interested parties willing to make land available for utility-scale renewable energy projects and gather relevant property information.

“Levelized Benefit” or “LB” means a calculation (\$/MWh) used for comparison of Proposals based on information provided in the Proposal submission in this RFP.

“Low- and Moderate-Income Customer” or “LMI Customer” is as defined in Tariff Rule No. 29 in Appendix J.

“Lump Sum Payment” has the meaning set forth in the Mid-Tier SFC Contract. It may also be referred to as a monthly Lump Sum Payment to reflect the portion of the payment made each month.

“Maui Electric” means Maui Electric Company, Ltd., a Hawai‘i corporation.

“Maui Electric System” or “System” means the electric system owned and operated by Maui Electric on the island of Moloka‘i (including any non-utility owned facilities) consisting of power plants, transmission and distribution lines, and related equipment for the production and delivery of electric power to the public.

“Maximum Rated Output” has the meaning set forth in the Mid-Tier SFC.

“Mediation” means the confidential mediation conducted in Honolulu, Hawai‘i, pursuant to and in accordance with the Mediation Rules, Procedures, and Protocols of Dispute Prevention Resolution, Inc. (or its successor) or, in its absence, the American Arbitration Association then in effect.

“Mid-Tier Project” means a project between 250 kW and 2.5 MW.

“Mid-Tier Standard Form Contract” or “Mid-Tier SFC” means the pre-approved standard form contract that will be used for projects 250 kW or greater in size, up to and including 2.5 MW, in the form of Appendix L of this RFP.

“MW” means megawatt.

“MWh” means megawatt hour.

“NEP” means Net Energy Potential.

“NEP RFP Projection” has the meaning set forth in the Mid-Tier SFC.

“Non-Price Evaluation Team” means Employees and consultants of the Company who evaluate the Proposal non-price related criteria as set forth in Section 4.4 of this RFP. Non-Price Evaluation Team members will not include any Shared Resources and will be solely made up of Company RFP Team Members.

“O&M” means operation and maintenance.

“Operating Period Security” has the meaning set forth in Section 14.4 of the Mid-Tier SFC.

“Paired Projects” means a Project proposed that incorporates both an energy generation component and an energy storage component as part of its Facility.

“Performance Standards” means the various performance standards for the operation of the Facility to the Company as set forth in Section 3 of Appendix B, as such standards may be revised from time to time pursuant to Article 23 of the Mid-Tier SFC, and as described in Chapter 2 of this RFP.

“Point of Interconnection” or “POI” has the meaning set forth in the Mid-Tier SFC.

“Power Purchase Agreement” or “PPA” means an agreement between an electric utility company and the developer of a renewable energy generation facility to sell the power generated by the facility to the electric utility company.

“Price Evaluation Team” means Employees and consultants of the Company who evaluate the Proposal price related criteria as set forth in Section 4.4 of this RFP. Price Evaluation Team members will not include any Shared Resources and will be solely made up of Company RFP Team Members.

“Priority List” means the group of Proposals selected by Maui Electric as described in Section 4.5 of this RFP.

“Project” means a Facility proposed to Maui Electric by a Proposer pursuant to this RFP.

“Proposal” means a proposal submitted to Maui Electric by a Proposer pursuant to this RFP.

“Proposal Due Date” means the date stated in RFP Schedule - Row 6 for the Self-Build Proposal and Row 7 for the IPP and Affiliate Proposal of this RFP.

“Proposal Fee” means the non-refundable fee for each proposal submitted as set forth in Section 1.8 of this RFP.

“Proposer” means a person or entity that submits a Proposal to Maui Electric pursuant to this RFP.

“Proposer’s Response Package” means the form in which the Proposal should be submitted, which is attached as Appendix B to this RFP.

“PUC” means the State of Hawai‘i Public Utilities Commission.

“Renewable Portfolio Standards” or “RPS” means the Hawai‘i law that mandates that the Company and its subsidiaries generate or purchase certain amounts of their net electricity sales over time from qualified renewable resources. The RPS requirements in Hawai‘i are currently codified in HRS §§ 269-91 through 269-95.

“Request for Proposals” or “RFP” means a request for Proposals issued pursuant to a competitive bidding process authorized, reviewed, and approved by the PUC.

“RFP Schedule” means the schedule set forth in Table 1, Section 3.1 of this RFP.

“Self-Build Option” or “SBO” means a Proposal submitted by the Company that is responsive to the resource need identified in the RFP, as required by Section VI of the Framework.

“Self-Build Team” means agents of the Company who develop Self-Build Option proposals.

“Seller” means the entity that the Company is contracting with, as set forth in the Mid-Tier SFC.

“Seller-Owned Interconnection Facilities” has the meaning set forth in the Mid-Tier SFC.

“Site” means the parcel of real property on which the Facility, or any portion thereof, will be constructed and located, together with any Land Rights reasonably necessary for the construction, ownership, operation and maintenance of the Facility.

“Site Control” has the meaning set forth in Section 4.3 of this RFP.

“Threshold Requirements” has the meaning set forth in Section 4.3 of this RFP.

Any capitalized term not defined in this RFP has the meaning set forth in the Mid-Tier SFC.

DRAFT
REQUEST FOR PROPOSALS
FOR
COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

*Appendix B – Proposer’s Response Package /
Project Interconnection Data Request*



**Maui
Electric**

1.0 GENERAL INSTRUCTIONS TO PROPOSERS

The Company has elected to use the services of PowerAdvocate®, a third-party electronic platform provider. Sourcing Intelligence®, developed by PowerAdvocate®, is the Electronic Procurement Platform that the Company has licensed and will utilize for the RFP process. All Proposals and all relevant information must be submitted via the Electronic Procurement Platform, in the manner described in this RFP.

Proposers must adhere to the response structure and file naming conventions identified in this Appendix for the Proposer's response package. Information submitted in the wrong location/section or submitted through communication means not specifically identified by the Company will not be considered by the Company.

Proposers must provide a response for every item. If input/submission items in the RFP are not applicable to a specific Proposer or Proposal variation, Proposers must clearly mark such items as "N/A" (Not Applicable) and provide a brief explanation.

Proposers must clearly identify all confidential information in their Proposals, as described in more detail in Section 3.12 Confidentiality of the RFP.

All information (including attachments) must be provided in English. All financial information must be provided in U.S. Dollars and using U.S. credit ratings.

It is the Proposer's sole responsibility to notify the Company of any conflicting requirements, ambiguities, omission of information, or the need for clarification prior to submitting a Proposal.

The RFP will be conducted as a "Sealed Bid" event within Sourcing Intelligence, meaning the Company will not be able to see or access any of the Proposer's submitted information until after the event closes.

1.1 ELECTRONIC PROCUREMENT PLATFORM

To access the RFP event, the Proposer must register as a "Supplier"¹ on Sourcing Intelligence (Electronic Procurement Platform). One Proposal may be submitted with each Supplier registration. Minor variations, as defined in Section 1.8.2 and 1.8.3 of this RFP may be submitted along with the Proposal under the same registration.

If a Proposer is already registered on Sourcing Intelligence, the Proposer may use their current login information to submit their first Proposal. Two variations of a Proposal, one variation of which is the base variation of the Proposal, may be submitted together as a Proposal by following the instructions outlined in this Appendix (see Section 4 below). If the Proposer chooses to submit more than one Proposal, the Proposer must register as a new "Supplier" on Sourcing Intelligence for each additional Proposal.

Each registration will require a unique username, unique Email address, and unique Company name. Proposers that require multiple registrations to submit multiple Proposals should use the Company name field to represent

¹ The language in Appendix B sometimes refers to "Energy Contract Managers" as "Bid Event Coordinator" and to "Proposers" as "Suppliers" (Bid Event Coordinator and Supplier are terms used by PowerAdvocate).

the Company name and Proposal number (ex: CompanyNameP1). Proposers may use shorthand or clear abbreviations. The unique Email address used to create the PowerAdvocate account does not necessarily have to match the Email address specified in Section 2.2.1 below. For example, if the Proposer is submitting multiple Proposals, all of the Proposer's Proposals could specify the same primary point of contact Email address if that is what the Proposer requests contact through for all their proposals.

Proposers can register for an account on Sourcing Intelligence by clicking on the "Registration" button (located in the top right corner of the webpage) on the PowerAdvocate website at the following address:

www.poweradvocate.com

The Proposer's use of the Electronic Procurement Platform is governed by PowerAdvocate's Terms of Use. By registering as a "Supplier" on the Electronic Procurement Platform, the Proposer acknowledges that the Proposer has read these Terms of Use and accepts and agrees that, each time the Proposer uses the Electronic Procurement Platform, the Proposer will be bound by the Terms of Use then accessible through the link(s) on the PowerAdvocate login page.

Once a Proposer has successfully registered as a "Supplier" with PowerAdvocate, the Proposer shall request access to the subject RFP event from the Company Contact via Email through the RFP Email Address set forth in Section 1.6 of the RFP. The Email request must list the Company Name field and username under which the Proposer has registered with PowerAdvocate. If the Proposer plans to submit multiple Proposals and has registered multiple accounts in accordance with the instructions above, the Email request must contain the Company Name field and username for each account that will be used to submit the Proposals. After being added to the event, the Proposer will see the bid event on their dashboard upon logging into Sourcing Intelligence. Once the RFP event opens, the Proposer may begin submitting their Proposal(s).

After registering and prior to the opening of the RFP, Proposers are encouraged to familiarize themselves with the Electronic Procurement Platform, including tabs, the dashboard, PowerAdvocate Users Guide (RFP Appendix D), etc. Proposers should note that they will not be able to access any bid documents until the event officially opens.

Proposers may contact PowerAdvocate Support for help with registration or modification of registration if desired. Support is available from 8 AM to 8 PM Eastern Time (2 AM to 2 PM Hawai'i Standard Time when daylight savings is in effect) Monday to Friday, except for Holidays posted on the PowerAdvocate website, both by phone (857-453-5800) and by Email (support@poweradvocate.com).

Contact information for PowerAdvocate Support can also be found on the bottom border of the PowerAdvocate website: www.poweradvocate.com

Once the RFP event is opened, registered Proposers will have online access to general notices and RFP-related documents via the Electronic Procurement Platform. Proposers should also monitor the RFP Website throughout the RFP event.

1.2 PROPOSAL SUBMISSION PROCEDURES

An Email notification will be sent to all registered Proposers when the event has been opened to receive Proposals.

After logging onto the Electronic Procurement Platform, the RFP will be visible on the Proposer's dashboard with several tabs, including the following:

- **"1. Download Documents:"** Documents stored under this tab are provided for the Proposer's use and information. All documents can be downloaded and/or printed, as required.
- **"2. Upload Documents:"** Proposal submission documents requested in Appendix B must be uploaded using this tab.
- Note that "3. Commercial Data:", "4. Technical Data:", and "5. Pricing Data:" tabs are NOT USED for this event.

Step-by-step instructions for submitting a complete Proposal are provided below:

1. Proposers must upload their Proposal files, including all required forms and files, to submit a complete Proposal. Self-Build, IPP and Affiliates must upload all files before their respective Proposal Due Date (RFP Section 3.1 Item 6 for Self-Build and Item 7 for IPP and Affiliates).
2. Submit (upload) one consolidated PDF representing your Proposal via the "2. Upload Documents" tab. That Proposal PDF must abide by the format specified in this Appendix B. A MSWord.docx template that outlines the format of this document is available under the "1. Download Documents" tab for the Proposer's use. **Response information must be provided in the order, format, and manner specified in this Appendix B and must clearly identify and reference the Appendix B section number that the information relates to.**
 - a. Proposers shall use a filename denoting: CompanyName_Proposal#.pdf.
(example: AceEnergy_P1.pdf)
3. Proposal information that cannot be easily consolidated into the PDF file described in Step 2 (such as large-scale drawing files) or files that must remain in native file format (such as computer models and spreadsheets) shall be **uploaded separately but must be referenced from within the main Proposal PDF file** (e.g., "See AceEnergyP1V2_2.5_SiteControlMap.kmz"). Such additional files must follow the naming convention below:
 - a. File names must include, in order, Company Name, Proposal number (if more than one Proposal being submitted per Proposer), Variation (if any variations are being submitted), Appendix B section number, and a file descriptor, as shown in the example file name below:
AceEnergyP1V2_2.5_SiteControlMap.kmz
Proposers may use abbreviations if they are clear and easy to follow.
4. Upload files using the **"2. Upload Documents"** tab on the Electronic Procurement Platform.
 - a. For all documents identify the "Document Type" as "Technical Information." (Do not identify any documents as "Commercial and Administrative" or "Pricing.")
 - b. "Reference ID" may be left blank.
 - c. Select "Choose File..." Navigate to and choose the corresponding file from your computer. Select "Open" and then "Submit Document."

There is no limit to the number or size of files that can be uploaded. Multiple files may be grouped into a .zip archive for upload. (Any zipped files must still adhere to the naming directions in #3 above.) When

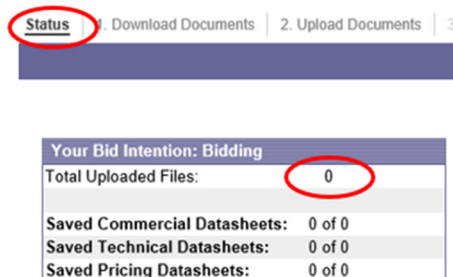
successfully uploaded, documents will appear under the "Bid Submissions" section on the bottom of the tab's page, organized within the "Technical Information" Document Type. Repeat steps a, b, and c, as required for each file upload.

If a file with the same name is uploaded twice, the Platform will automatically append a unique numerical extension to the Document Name. To delete a file that has been previously uploaded, click on the "X" button in the "Actions" column for the file to be deleted. Do not upload any files prior to the issuance of the Final RFP.

5. The Company will not be responsible for technical problems that interfere with the upload or download of Proposal information. Support is available to answer technical questions about PowerAdvocate's Sourcing Intelligence from 8 AM to 8 PM Eastern Time (2 AM to 2 PM Hawai'i Standard Time when daylight savings is in effect) Monday to Friday, except for Holidays posted on the PowerAdvocate website, both by phone (857-453-5800) and by Email (support@poweradvocate.com).
6. Proposers are strongly encouraged to start early and avoid waiting until the last minute to submit the required information. Proposers are allowed to add, modify, and/or delete documents that have been previously submitted any time prior to the event close deadline. For clarity, it is the Proposer's responsibility to ensure a complete Proposal is uploaded into PowerAdvocate before the Proposal Due Date.
7. Any questions or concerns regarding the RFP, may be submitted to the Company Contact via the RFP Email address provided in Section 1.6 of the RFP. Per RFP Section 1.4.2, the Independent Observer will monitor messages within the bid event. Proposers are responsible for following instructions and uploading documents in their appropriate locations. Documents uploaded in the wrong tab will not be considered by the Company.

1.3 PROPOSAL COMPLETION AND CONFIRMATION PROCEDURES

To confirm the submission of all proposal files, in the "Status" tab on the Electronic Procurement Platform, confirm that the "Total Uploaded Files" is the number of expected files to be included in the submission by checking it against your list of submitted files. Example "Status" tab view:



As stated above in Section 1.2, nothing should be uploaded to the Commercial, Technical or Pricing Datasheet tabs. Documents uploaded there will not be included in your Proposal submission.

1.3.1 **Proposal Fee Delivery Information.** Provide the Proposal Fee submission information for this Proposal. Include:

- The Date the Proposal Fee was sent.
- The delivery service used and the tracking number for the parcel.
- The U.S.-chartered bank name that issued the cashier’s check and the check number.

2.0 PROPOSAL (BASE VARIATION) SUMMARY TABLE

Base variation Proposal Summary. If proposal variations are submitted, any changes to the summary information for such variations must be specifically identified in a similar table placed in sections 4.2, 4.3, 4.4, etc. of this Appendix, as applicable.

To be filled out completely by IPP or Affiliate Proposers:

1	Proposer Name (Company Name)	
2	Parent Company/Owner/Sponsor/Business Affiliation/etc.	
3	Project Name	
4	Net AC Capacity of the Facility (MW)	
5	Proposed Facility Location Street Address if available, or what City/Area on the island is it near	
6	TMK(s) of Facility Location (use 9-digit TMK format)²	
7	Point of Interconnection’s Circuit Name	
8	Coordinates for Point of Interconnection (use decimal degrees)³	
9	Net Energy Potential (NEP) Projection for the Facility (MWh)	
10	Lump Sum Payment (\$/Year)	
11	Does Project include an Energy Storage Component? (Yes/No)	
If the Project includes an Energy Storage Component:		
12	Project Energy Storage Technology	
13	Energy Storage Capability for the Facility (MW and MWh)	
14	Is the Project capable of being 100% charged from the grid after the 5 year ITC recapture period? (Yes/No)	
15	Is the Project grid-forming and black start capable? (Yes/No)	
16	Proposal Guaranteed Commercial Operations Date (MM/DD/YYYY)	
17	The Proposer hereby certifies that the Project meets all performance attributes identified in Section 2.1 of the RFP? (Yes/No)	

² 9-digit Tax Map Key format: Island Number (1 digit); Zone Number (1 digit); Section Number (1 digit); Plat Number (3 digits, add leading zeros if less than 3 digits); Parcel Number (3 digits, add leading zeros if less than 3 digits).

³ Decimal degrees (YY.YYYYYY, -XXX.XXXXXX) latitude and longitude coordinates of the Point of Interconnection for the project. If there is more than one interconnection point, specify each.

18	The Proposer hereby certifies that the Proposal (including its pricing elements) is not contingent upon changes to existing County, State or Federal laws or regulations. (Yes/No)	
19	The Proposer hereby agrees to provide Development Period Security and Operating Period Security as set forth in the Model Mid-Tier SFC. (Yes/No)	
20	The Proposer hereby certifies under penalties of perjury that this Proposal has been made in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business partnership, corporation, union, committee, club, or organization, entity, or group of individuals. (Yes/No)	
21	The Proposer hereby certifies that the Proposer, its parent company, or any affiliate of the Proposer has not either defaulted on a current contract with the Company, had a contract terminated by the Company, or has any pending litigation in which the Proposer has made claims against the Company (Yes/No)	

To be filled out completely by Self-Build Proposers:

1	Proposer Name (Company Name)	
2	Parent Company/Owner/Sponsor/Business Affiliation/etc.	
3	Project Name	
4	Net AC Capacity of the Facility (MW)	
5	Proposed Facility Location Street Address if available, or what City/Area on the island is it near	
6	TMK(s) of Facility Location (use 9-digit TMK format)⁴	
7	Point of Interconnection’s Circuit Name	
8	Coordinates for Point of Interconnection (use decimal degrees)⁵	
9	Net Energy Potential (NEP) Projection for the Facility (MWh)	
10	Does Project include an Energy Storage Component? (Yes/No)	
If the Project includes an Energy Storage Component:		
11	Project Energy Storage Technology	
12	Energy Storage Capability for the Facility (MW and MWh)	
13	Is the Project capable of being 100% charged from the grid after the 5 year ITC recapture period? (Yes/No)	
14	Is the Project grid-forming and black start capable? (Yes/No)	
15	Proposal Guaranteed Commercial Operations Date (MM/DD/YYYY)	
16	The Proposer hereby certifies that the Project meets all performance attributes identified in Section 2.1 of the RFP? (Yes/No)	
17	The Proposer hereby certifies that the Proposal (including its pricing elements) is not contingent upon changes to existing County, State or Federal laws or regulations. (Yes/No)	
18	The Proposer hereby agrees to provide Development Period Security and Operating Period Security as set forth in the Model Mid-Tier SFC. (Yes/No)	
19	The Proposer hereby certifies under penalties of perjury that this Proposal has been made in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business partnership,	

⁴ 9-digit Tax Map Key format: Island Number (1 digit); Zone Number (1 digit); Section Number (1 digit); Plat Number (3 digits, add leading zeros if less than 3 digits); Parcel Number (3 digits, add leading zeros if less than 3 digits).

⁵ Decimal degrees (YY.YYYYYYY, -XXX.XXXXXXX) latitude and longitude coordinates of the Point of Interconnection for the project. If there is more than one interconnection point, specify each.

	corporation, union, committee, club, or organization, entity, or group of individuals. (Yes/No)		
20	Year (YYYY)	Project Capital Cost (\$)	Extend the table for questions 20 21, and 22 for as many years as needed.
21	Year (YYYY)	O&M Cost (\$)	
22	Year (YYYY)	Annual Revenue Requirement (\$)	

2.1 REQUIRED FORMS ACCOMPANYING PROPOSAL PDF

The following forms must accompany each proposal, must be attached to the Proposal PDF, and uploaded via the “2. Upload Documents” tab:

- Document signed by an officer or other Proposer representative **authorizing the submission** of the Proposal
- Fully executed **CBRE Mutual Confidentiality and Non-Disclosure Agreement** (Appendix E to the RFP, may be downloaded from the “1. Download Documents” tab in the Electronic Procurement Platform)
- **Certificate of Vendor Compliance** for the Proposer
 - **Certificate of Good Standing** for the Proposer and **Federal and State tax clearance certificates** for the Proposer may be provided in lieu of the Certificate of Vendor Compliance
- **Certification of Counsel for Proposer**, if applicable. (See Appendix B Attachment 1.)
- Completed applicable **Project Interconnection Data Request worksheet** for the proposed technology and **project diagram(s)**. **Models for equipment and controls, list(s)** identifying components and **respective files** (for inverters and power plant controller), and **complete documentation with instructions** as specified in the Data Request worksheet shall be submitted within the respective timeframes specified in Section 5.1 of the RFP.⁶ (See Section 2.11.1 below)
- [For Self-Build Only] **Self-Build Option Team Certification Form**. See Appendix G Attachment 1.

⁶ If the Models, lists, respective files and complete documentation are not submitted with the Proposal upload, they shall be submitted via PowerAdvocate’s Messaging as attachments within the respective timeframes specified in Section 5.1 of the RFP.

- [For Self-Build Only] **Revenue Requirements Worksheets** that support the annual revenue requirements estimates shall be submitted. A starter revenue requirements template file can be requested by the Self-Build Team via email to the RFP Email Address once the RFP event opens. The revenue requirements worksheets submitted will be modified to reflect the details of the Project's Proposal. All assumptions used will be reflected in an assumptions input tab.

2.2 PROPOSAL SUMMARY/CONTACT INFORMATION

2.2.1 Provide a **primary point of contact** for the Proposal being submitted:

- Name
- Title
- Mailing Address
- Phone Number
- Email Address – this will be the official communication address used during the RFP process

2.2.2 **Executive Summary of Proposal.** The executive summary must include an approach and description of the important elements of the Proposal, including a description if a minor variation to the base variation is being submitted. Refer to Section 1.8.2 and 1.8.3 of the RFP for an explanation of minor variations that are allowed. If a minor variation to the base variation is proposed, a **table summarizing the differences of the minor variation in Section 4 shall be included.**

2.2.3 **Pricing information.** Pricing information must be filled out in the Section 2.0 Proposal Summary Table above. If a minor variation to the base variation is proposed, the minor variation's pricing summary **must** be identified in a similar pricing table in Sections 4.2.0 below. Proposers must **provide pricing information only in those table sections** – **do not** embed pricing information in any other portion of the Proposal PDF.

2.2.4 Provide a **high-level overview of the proposed Facility**, including at a minimum the following information:

- Facility Generation Size (MW_{AC} and MW_{DC})
- Net Maximum Output Capacity of the Facility at the Point(s) of Interconnection (MW_{AC})
- Identified Available Circuit Capacity at the Point(s) of Interconnection (MW_{AC}). If a Circuit Capacity value is provided, please describe the source of the value (i.e. LVM, Company response to Proposer's inquiry, etc.).
- Technology Type
- Number of Generators
- Rated Output of each Generator
- Generator Facility Design Characteristics

Storage component:

- Technology Type (i.e. lithium ion battery)
- Maximum Rated Output, as defined in the applicable contract (MW)
- Discharge Duration at Maximum Rated Output (hours)
- Storage Energy Capacity (MWh) available at the point of interconnection (i.e. BESS Contract Capacity as defined in the applicable contract)

- Operational Limitations, such as, but not limited to: grid charging limits (with respect to ITC), energy throughput limits (daily, monthly, annually), State of Charge restrictions (min/max SOC while at rest (not charging/discharging)), etc. Proposed Operational Limits cannot be in conflict with the energy discharge requirement in Sections 1.2.13 and 1.2.14 of the RFP. If such a conflict is identified, the Proposal may be disqualified.
- Round Trip Efficiency (“RTE”): Specify a single value (percentage) that the Facility is required to maintain throughout the term of the applicable contract. The RTE must consider and reflect:
 - the technical requirements of the Facility (as further set forth in the applicable contract);
 - that the measurement location of charging and discharged energy is at the point of interconnection;
 - electrical losses associated with the point of interconnection measurement location;
 - any auxiliary and station loads that need to be served by BESS energy during charge and discharge that may not be done at Maximum Rated Output or over a fixed duration; and
 - that the data used to validate the RTE will be captured during a full charge cycle (0%-100% SOC) directly followed by a full discharge cycle (100%-0% SOC).
- Describe any augmentation plans for the storage component to maintain the functionality and characteristics of the storage during the term of the applicable contract. Include any expected interval of augmentation (months/years).
- Estimated useful life of the storage component (including augmentation if used) (years).

2.3 FINANCIAL

Provide the following financial information identified below. As specified in the General Instructions in Section 1.0 above, all information (including attachments) must be provided in English, be provided in U.S. Dollars and use U. S. credit ratings.

2.3.1 Identification of Equity Participants

2.3.1.1 Who are the **equity participants** in the Project (or the equity partners’ other partners)?

2.3.1.2 Provide an **organizational structure** for the Proposer including any general and limited partners and providers of capital that identifies:

- Associated responsibilities from a financial and legal perspective
- Percentage interest of each party

2.3.2 Project Financing

2.3.2.1 **How will the Project be financed** (including construction and term financing)? Address at a minimum:

- The Project’s projected financial structure
- Expected source of debt and equity financing

2.3.2.2 [For IPP and Affiliate Proposals] Identify all **estimated development and capital costs** for, at a minimum:

- Equipment
 - Identify the manufacturer and model number for all major equipment
- Construction

- Engineering
- Seller-Owned Interconnection Facilities
- Company-Owned Interconnection Facilities
- Land
- Annual O&M
- (For Projects that include a storage component) Specify a percentage of the total project cost that is estimated to be attributed to the storage functionality of the Facility. As the storage functionality is treated as a lease, the Company will use the percentage for its preliminary calculation of the lease liability only. This percentage requested for the Company's accounting purposes does not affect nor alter the liquidated damage provisions of the Mid-Tier SFC, as those provisions reflect the benefit the Company seeks from the Project's storage functionality.

[For Self-Build Only] Identify all **estimated development and capital costs** for, at a minimum:

- Facility (including any generation and storage components)
- Outside Services
- Interconnection
- Overhead Costs
- Allowance for Funds Used During Construction
- Annual O&M
- Specify the percentage of the total cost associated with the storage component of the Facility
- (For Projects that include a storage component) Specify a percentage of the total project cost that is estimated to be attributed to the storage functionality of the Facility. As the storage functionality is treated as a lease, the Company will use the percentage for its preliminary calculation of the lease liability only. This percentage requested for the Company's accounting purposes does not affect nor alter the liquidated damage provisions of the Mid-Tier SFC, as those provisions reflect the benefit the Company seeks from the Project's storage functionality.

2.3.2.3 Discuss and/or provide **supporting information on any project financing guarantees**.

2.3.2.4 Describe any **written commitments obtained from the equity participants**.

2.3.2.5 Describe any **conditions precedent to project financing**, and the Proposer's plan to address them, other than execution of the Power Purchase Agreement or any other applicable project agreements and State of Hawaii Public Utilities Commission approval of the Power Purchase Agreement and other agreements.

2.3.2.6 Provide any **additional evidence to demonstrate that the Project is financeable**.

2.3.3 Project Financing Experience of the Proposer

Describe **the project financing experience of the Proposer** in securing financing for projects of a similar size (i.e., no less than two-thirds the size) and technology as the one being proposed including the following information for any referenced projects:

- Project Name
- Project Technology

- Project Size
- Location
- Date of Construction and Permanent Financing
- Commercial Operations Date
- Proposer's Role in Financing of the Project
- Off-taker
- Term of the Interconnection Agreement
- Financing Structure
- Major Pricing Terms
- Name(s) of Finance Team Member(s); Time (i.e., years, months) worked on the project and Role/Responsibilities

2.3.4 Evidence of the Proposer's Financial Strength

2.3.4.1 Provide **copies of the Proposer's audited financial statements** (balance sheet, income statement, and statement of cash flows):

- Legal Entity
 - Three (3) most recent fiscal years
 - Quarterly report for the most recent quarter ended
- Parent Company
 - Three (3) most recent fiscal years
 - Quarterly report for the most recent quarter ended

2.3.4.2 Provide the **current credit ratings** for the Proposer (or Parent Company, if not available for Proposer), affiliates, partners, and credit support provider:

- Standard & Poor's
- Moody's
- Fitch

2.3.4.3 Describe any **current credit issues** regarding the Proposer or affiliate entities raised by rating agencies, banks, or accounting firms.

2.3.4.4 Provide any **additional evidence that the Proposer has the financial resources and financial strength** to complete and operate the Project as proposed.

2.3.5 Provide **evidence** that the Proposer can provide **the required securities**.

2.3.5.1 Describe the Proposer's **ability (and/or the ability of its credit support provider) and proposed plans to provide the required securities** including:

- Irrevocable standby letter of credit
- Sources of security
- Description of its credit support provider

2.3.6 Disclosure of Litigation and Disputes

Disclose any **litigation, disputes, and the status of any lawsuits or dispute resolution** related to projects owned or managed by the Proposer or any of its affiliates

2.3.7 State to the best of the Proposer's knowledge: Will the Project result in consolidation of the Developer entity's finances onto the Company's financial statements under FASB 810. Provide supporting information to allow the Company to verify such conclusion.

2.4 CONTRACT EXCEPTIONS

2.4.1 The Mid-Tier SFC for projects 250 kW to 2.5 MW will be preapproved by the Commission and as a result, modifications may not be proposed to it.

2.5 SITE INFORMATION

2.5.1 The Proposal must demonstrate that the Proposer has Site Control for all real property required for the successful implementation of a specific Proposal at a Site not controlled by the Company, including any Interconnection Facilities for which the Proposer is responsible. In addition, developmental requirements and restrictions such as zoning of the Site and the status of easements must be identified. **Provide documentation set forth in RFP Section 4.3 to prove Site Control.**

2.5.2 Provide a **map of the Project site** that clearly identifies:

- Location of the parcel on which the site is located
- Tax map key number (9-digit format: Island Number (1 digit), Zone Number (1 digit), Section Number (1 digit), Plat Number (3 digits, add leading zeros if less than 3 digits), Parcel Number (3 digits, add leading zeros if less than 3 digits)
- Site boundaries (if the site does not cover the entire parcel)
- Total acreage of the site
- Point(s) of Interconnection
- Relationship of the site to other local infrastructure

2.5.3 Provide a **site layout plan** which illustrates:

- Proposed location of all equipment
- Proposed location of all facilities on the site, including any proposed line extensions

2.5.4 Describe the **Interconnection route** and include:

- Site sketches of how the facility will be interconnected to the Company's System (above-ground and/or underground)
- Identify the approximate latitude and longitude of the proposed Point of Interconnection, in decimal degrees format, to six (6) decimal places.
- Description of the rationale for the interconnection route

2.5.5 Identify **any rights-of-way or easements** that are required for access to the site or for interconnection route:

- Describe the status of rights-of-way or easement acquisition

- Describe the plan for securing the necessary rights-of-way or easement, including the proposed timeline

2.5.6 Provide a description of any critical infrastructure or community resilience hubs in proximate location to the proposed Project site that could benefit from an islanding capability of the proposed Project and could enhance resilience in the community.

2.6 ENVIRONMENTAL COMPLIANCE AND PERMITTING PLAN

Scoring of proposals for the non-price evaluation criteria of this section will be based on the completeness and thoroughness of responses to each of the criteria listed below. The Company recommends that each Proposal incorporate the list below as an outline together with complete and thorough responses to each item in the list. Proposals that closely follow this recommendation will typically be awarded higher scores than proposals that do not.

2.6.1 Describe your **overall land use and environmental permits and approvals strategy** and approach to obtaining successful, positive results from the agencies and authorities having jurisdiction, including:

- Explanation of the conceptual plans for siting
- Studies/assessments
- Permits and approvals
- Gantt format schedule which identifies the sequencing of permit application and approval activities and critical path. (Schedule must be in MM/DD/YY format.)

2.6.2 Discuss the **city zoning and state land use classification**:

- Identify present and required zoning and the ability to site the proposed Project within those zoning allowances.
- Identify present and required land use classifications and the ability to site the proposed Project within those classifications.
- Provide evidence of proper zoning and land use classifications for selected site and interconnection route.
- If changes in the above are required for the proposed Project, provide a plan and timeline to secure the necessary approvals.

2.6.3 Identify all required discretionary and non-discretionary **land use, environmental and construction permits, and approvals** required for development, financing, construction, and operation of the proposed Project, including but not limited to zoning changes, Environmental Assessments, and/or Environmental Impacts Statements.

Provide a **listing of such permits and approvals** indicating:

- Permit Name
- Federal, State, or Local agencies and authorities having jurisdiction over the issuance
- Status of approval and anticipated timeline for seeking and receiving the required permit and/or license
- Explanation of your basis for the assumed timeline

- Explain any situation where a permit or license for one aspect of the Project may influence the timing or permit of another aspect (e.g. a case where one permit is contingent upon completion of another permit or license), if applicable.
- Explain your plans to secure all permits and approvals required for the Project.

2.6.4 Provide a **preliminary environmental assessment of the site** (including any pre-existing environmental conditions) and potential short- and long-term **impacts** associated with, or resulting from, the proposed Project – including direct, indirect, and cumulative impacts associated with development, construction, operation, and maintenance of the proposed Project in every area identified below. Discuss if alternatives have been or will be considered. The assessment shall also include Proposer’s short- and long-term plans to mitigate such impacts and explanation of the mitigation strategies for, but not limited to, each of the major environmental areas as presented below:

- Natural Environment
 - Air quality
 - Biology (Natural habitats and ecosystems, flora/fauna/vegetation, and animals, especially if threatened or endangered)
 - Climate
 - Soils
 - Topography and geology
- Land Regulation
 - Land Uses, including any land use restrictions and/or pre-existing environmental conditions/contamination
 - Flood and tsunami hazards
 - Noise
 - Roadways and Traffic
 - Utilities
- Socio-Economic Characteristics
- Aesthetic/Visual Resources
- Solid Waste
- Hazardous Materials
- Water Quality
- Public Safety Services (Police, Fire, Emergency Medical Services)
- Recreation
- Potential Cumulative and Secondary Impacts

2.6.5 Provide a **decommissioning plan**, including:

- Developing and implementing program for recycling to the fullest extent possible, or otherwise properly disposing of installed infrastructure, if any, and
- Demonstrating how restoration of the Site to its original ecological condition is guaranteed in the event of default by the Proposer in the applicable Site Control documentation.

2.7 CULTURAL RESOURCE IMPACTS

2.7.1 Provide a **proposal to ensure cultural sites are identified and carefully protected** as part of a cultural impact plan as it pertains to the Project Site and interconnection route. This proposal must include at a minimum:

- An initial analysis that identifies:

- 1) valued cultural, historical, or natural resources in the area in question, including the extent to which traditional and customary native Hawaiian rights are exercised in the area;
 - 2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and
 - 3) the feasible action, if any, to be taken to reasonably protect any identified cultural, historical, or natural resources in the area in question, and the reasonable protection of traditional and customary native Hawaiian rights in the affected area.
- Proposer’s experience with cultural resource impacts on past projects
 - Consultant’s experience with cultural resource impacts on past projects (name, firm, relevant experience)
 - Status of the cultural impact plan (including, but not limited to: Cultural Impact Assessment, Cultural Landscape Study, Cultural Resource Management Plan, Ethnographic Survey, Consultation on Section 106 Process, and/or Traditional Cultural Property Studies)

2.8 COMMUNITY OUTREACH

Gaining community support is an important part of a Project’s viability and success. An effective Community Outreach Plan will call for early meaningful communications with stakeholders and will reflect a deep understanding and respect for the community’s desire for information. The public meeting and comment solicitation process described in Section 5.3 of the RFP is intended to support that premise and the Commission’s desire to increase bid transparency within the RFP process. When developers neglect to demonstrate transparency and a willingness to engage in early and frequent communication with Hawaii’s communities, costly and timely challenges to their projects have resulted. In some instances, projects have failed. Incorporating transparency during the competitive bidding phase may seem unconventional, but it has become an essential community expectation. Developers must share information and work with communities to address concerns through careful listening, thoughtful responsiveness, and a commitment to respect the environmental and cultural values of Hawai‘i.

2.8.1 Provide a **detailed Community Outreach Plan** to work with and inform neighboring communities and stakeholders and to provide them timely information during all phases of the Project. The plan shall address, but not be limited to, the following items:

- Project description
- Community scoping
- Project benefits
- Government approvals
- Development process
 - Identification of communities and other stakeholders that may be affected by the proposed Project:
 - How will they be affected?
 - What mitigation strategies will the Proposer implement?
- Comprehensive communication strategy with affected communities and the general public regarding the proposed Project:
 - Describe frequency of communication
 - Provide source of information

- Identify communication outlets
- Describe opportunities, if any for affected communities and general public to provide the developer with feedback and comments on the proposed Project

Proposers are reminded of RFP Section 3.4.2 including Proposals must provide all referenced material if it is to be considered during the Proposal evaluation.

2.8.2 Provide any **documentation of local community support or opposition** including any letters from local organizations, newspaper articles, or communications from local officials.

2.8.3 Provide a **description of community outreach efforts** already taken or currently underway, including the names of organizations and stakeholders contacted about the proposed Project.

2.8.4 Describe any anticipated or negotiated investment in the community and other **community benefits** that the Proposer proposes to provide in connection with the Project, along with an estimated value of the community benefits in dollars (including the cost to Proposers providing the benefits and supporting details on how those costs and benefits were derived).

2.8.5 All Proposers selected to the Final Award Group must display the below table of information on their website as described in Section 5.3 of the RFP to provide communities Project information that is of interest to them in a standard format. All information in this table must be included in all community presentations in addition to the Proposer’s project website.

PROJECT SUMMARY AND COMMUNITY OUTREACH PLAN

*	Proposer Name (Company name)	
*	Parent Company/Owner/Sponsor/Business Affiliate/etc.	
*	Project Name	
*	Net AC Capacity of the Facility (MW) (must match Proposal information)	
*	Proposed Facility Location, Street Address if available, or what City/Area on the island it is near	
*	TMK(s) of Facility Location (must match Proposal information)	
*	Point of Interconnection’s Circuit or Substation Name (must match Proposal information)	
*	Project Description (in 200 words or less)	<i>(A description that includes information about the project that will enable the community to understand the impact that the Project might have on the community.)</i>
*	Project site map	<i>(provide a map similar to what was provided in Section 2.5.2)</i>
*	Site layout plan	<i>(provide a layout similar to what was provided in Section 2.5.3)</i>

*	Interconnection route	<i>(provide a map of the route similar to what was provided in Section 2.5.4)</i>
Environmental Compliance and Permitting Plan		
*	Overall land use and environmental permits and approvals strategy	<i>(provide information in level of detail as provided in Section 2.6.1)</i>
*	Gantt format schedule which identifies the sequencing of permit applications and approval activities and critical path. Schedule must be in MM/DD/YY format)	<i>(provide information in level of detail as provided in Section 2.6.1)</i>
*	City Zoning and Land Use Classification	<i>(provide information in level of detail as provided in Section 2.6.2)</i>
*	Discretionary and non-discretionary Land use, environmental and construction permits and approvals	<i>(provide information in level of detail as provided in Section 2.6.3)</i>
*	Listing of Permits and approvals	<i>(provide information in level of detail as provided in Section 2.6.3)</i>
*	Preliminary environmental assessment of the Site (including any pre-existing environmental conditions)	<i>(provide information in level of detail as provided in Section 2.6.4)</i>
Cultural Resource Impacts		
*	Proposer's updated Community Outreach Plan must include a plan that (1) identifies any cultural, historic or natural resources that will be impacted by the Project (2) describes the potential impacts on these resources and (3) identifies measures to mitigate such impacts.	<i>(provide information in level of detail as provided in Section 2.7)</i>
Community Outreach		
*	Detailed Community Outreach Plan	<i>(provide key information from Community Outreach Plan as specified in Section 2.8.1 or provide a link to updated comprehensive Community Outreach Plan)</i>
*	Local community support or opposition	<i>(provide latest comprehensive information)</i>
*	Community outreach efforts	<i>(provide latest comprehensive information)</i>
*	Community benefits	<i>(provide latest comprehensive information)</i>

2.9 OPERATIONS AND MAINTENANCE (O&M)

2.9.1 To demonstrate the long-term operational viability of the proposed Project, describe the **planned operations and maintenance**, including:

- Operations and maintenance funding levels, annually, throughout the term of the contract.
- Description of the operational requirements by frequency (daily, weekly, monthly, yearly, as-necessary, run hour interval) and maintenance requirements by frequency (daily, weekly, monthly, yearly, as-necessary, run hour interval).
- A discussion of the staffing levels proposed for the Project and location of such staff. If such staff is offsite, describe response time and ability to control the Project remotely.
- Technology specific maintenance experience records.
- Identification of any O&M providers.
- The expected role of the Proposer (Owner) or outside contractor.
- Scheduling of major maintenance activity.
- Plan for testing equipment.
- Estimated life of Generation and/or Storage Facilities and associated Interconnection Facilities.
- Safety plan, including historical safety records with environmental history records, violations, and compliance plans.
- Security plan.
- Site maintenance plan.
- Substation equipment maintenance plan.

2.9.2 State whether the Proposer would **consider 24-hour staffing**. Explain how this would be done.

2.9.3 Describe the **Proposer's contingency plan**, including the Proposer's mitigation plans to address failures. Such information should be described in the Proposal to demonstrate the Project's reliability with regard to potential operational issues.

2.9.4 Describe if the Proposer will **coordinate their maintenance schedule** for the Project with the Company's annual planned generation maintenance.

2.9.5 Describe the **status of any O&M agreements or contracts** that the Proposer is required to secure. Include a discussion of the Proposer's plan for securing a long-term O&M contract.

2.9.6 Provide **examples of the Proposer's experience with O&M services** for other similar projects.

2.10 PERFORMANCE STANDARDS

2.10.1 Design and operating information. Provide a **description of the project design**. Description shall include:

- Configuration description, including conceptual or schematic diagrams.
- Overview of the Facility Control Systems – central control and inverter- or resource-level control.
- Diagrams approved by a Professional Electrical Engineer registered in the State of Hawai'i, indicated by the presence of the Engineer's Professional seal on all drawings and documents. Including but not limited to:

- A single-line diagram, relay list, trip scheme and settings of the generating facility, which identifies the Point of Interconnection, circuit breakers, relays, switches, synchronizing equipment, monitoring equipment, and control and protective devices and schemes.

2.10.1.1 Provide the projected **hourly annual energy potential production profile of the Facility**⁷ (24 hours x 365 days, 8760 generation profile) for the provided RFP NEP Projection.

2.10.1.2 Provide the **sample rate of critical telemetry** (i.e. frequency and voltage) based on inputs to the facility control systems.

2.10.1.3 Provide a description of the Facility's **capability to be grid-forming and have black start capability**.

2.10.1.4 Provide the explanation of the methodology and underlying **information used to derive the Project's NEP RFP Projection**, including the preliminary design of the Facility and the typical meteorological year file used to estimate the Renewable Resource Baseline, as required in Article 6.6 of the Mid-Tier SFC. The explanation of the methodology should include, but not be limited to, the long-term resource data used, the gross and net generation MWh, and assumptions (loss factors, uncertainty values, any grid or project constraints).

2.10.2 **Capability of Meeting Performance Standards.** The proposed Facility must meet the performance attributes identified in Section 2.1 of the RFP. Provide **confirmation that the proposed Facility will meet the requirements identified** or provide clarification or comments about the Facility's ability to meet the performance standards. Proposals should include sufficient documentation to support the stated claim that the Facility will be able to meet the Performance Standards. The Proposal should include information required to make such a determination in an organized manner to ensure this evaluation can be completed within the evaluation review period.

2.10.3 **Reactive Power Control:** Provide the facility's ability to meet the Reactive Power Control capabilities, including Voltage Regulation at the point of interconnection, required in the Performance Standards, including contribution from the inverters of generation and/or storage and means of coordinating the response. Provide the inverter capability curve(s). Confirm ability to provide reactive power at zero active power.

2.10.4 **Ramp Rate** for Generation Facilities: Confirm the ability to meet the ramp rate requirement specified in the Mid-Tier SFC.

2.10.5 **Undervoltage ride-through:** Provide the facility's terminal voltage level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.6 **Overvoltage ride-through:** Provide the facility's terminal voltage level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to

⁷ The projected hourly annual energy production profile is the projected output from the generating facility without curtailment and before any energy is directed to an energy storage component, if one will be provided.

meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.7 **Transient stability ride-through:** Provide the facility's ability to stay online during Company System: (1) three-phase fault located anywhere on the Company System and lasting up to __ cycles; and (2) a single line to ground fault located anywhere on the Company System and lasting up to __ cycles. Provide the Facility's ability to withstand subsequent events.

2.10.8 **Underfrequency ride-through:** Provide the facility's terminal frequency level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.9 **Overfrequency ride-through:** Provide the facility's terminal frequency level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.10 **Frequency Response:** Provide the facility's frequency response characteristics as required by the Mid-Tier SFC, including time of response, tunable parameters, alternate frequency response modes and means of implementing such features.

2.10.11 **Auxiliary Power Information:** Proposer must provide the maximum auxiliary power requirements for:

- Start-up
- Normal Operations (from generator)
- Normal Operating Shutdown
- Forced Emergency Shutdown
- Maintenance Outage

2.10.12 **Coordination of Operations:** Provide a description of the control facilities required to coordinate generator operation with and between the Company's System Operator and the Company's System.

- Include a description of the equipment and technology used to facilitate dispatch to the Company and communicate with the Company.
- Include a description of the control and protection requirements of the generator and the Company's System.

2.10.13 **Cycling Capability:** Describe the Facility's ability to cycle on/off and provide limitations.

2.10.14 **Active Power Control Interface:** Describe the means of implementing active power control and the Power Possible, including the contribution to the dispatch signal from paired storage, if any. Provide the Proposer's experience dealing with active power control, dispatch, frequency response, and ride-through.

2.10.15 Provide the details of the **major equipment** (i.e. batteries, inverters, battery management system), including, but not limited to, name of manufacturer, models, key metrics, characteristics of the equipment, and performance specifications.

2.10.16 **Energy Storage performance standards:** For projects that include a storage component, provide additional performance standard descriptions as follows:

- MWh storage output for a full year
- Ramp Rate: Provide the Facility’s ramp rate, which should be no more than 2 MW/minute for all conditions other than those under control of the Company System Operator and/or those due to desired frequency response.
- System Response Time – Idle to Design Maximum (minutes)
- Discharge Start-up time (minutes from notification)
- Charge Start-up time (minutes from notification)
- Start and run-time limitations, if any
- Ancillary Services provided, if any (i.e. Spinning Reserves, Non-Spinning Reserves, Regulation Up, Regulation Down, Black Start capability, other)

2.10.17 Provide the description and details of the **grid-charging capabilities of the Facility**. Include a description on the ability to control the charging source.

2.11 INTERCONNECTION SUBMITTAL REQUIREMENTS

2.11.1 A summary of the model requirements and impact study scope can be found in Appx B Att 6 from the “1. Download Documents” tab.

2.11.2 For projects sized at 250 KW, provide Project single line and three line diagrams and an equipment list with the Proposal submission.

2.11.3 For projects greater than or equal to 1 MW in size, provide the appropriate completed **Project Interconnection Requirement Study Data Request worksheets** for the proposed technology with the Proposal submission. (The forms can be found in the “1. Download Documents” tab as Appx B Att 2 Project Interconnection Data Request Worksheet (PV Generation) MSExcel file.) Also provide all **project diagram(s)** with the Proposal submission. **Models for equipment and controls, list(s)** identifying components and **respective files** (for inverters and power plant controller), and **complete documentation with instructions** shall be submitted within the timeframes specified in Section 5.1 of the RFP. Proposers may also download the Facility Technical Model Requirements and Review Process documentation labelled as Appx B Att 3 from the “1. Download Documents” tab.

2.12 PROVEN TECHNOLOGY

2.12.1 Provide all supporting information for the Company to assess the **commercial and financial maturity of the technology** being proposed. Provide any supporting documentation that shows examples of projects that:

- Use the technology at the scale being proposed
- Have successfully reached commercial operations
- Demonstrate experience in providing Active Power dispatch

2.13 EXPERIENCE AND QUALIFICATIONS

Proposers, its affiliated companies, partners, and/or contractors and consultants are required to demonstrate project experience and management capability to successfully develop and operate the proposed Project.

2.13.1 Provide a hierarchical **organizational / management chart** for the Project that lists all key personnel and project participants dedicated to this Project and that identifies the management structure and responsibilities. In addition to the chart, Proposers must provide biographies / resumes of the key personnel, including position, years of relevant experience and similar project experience. Proposers must provide specifics as they relate to financing of renewable energy projects. Identify architects and engineers or provision to provide same that are licensed to practice in the State of Hawaii. Providers must also provide a completed table:

- For each of the project participants (including the Proposer, partners, and proposed contractors), fill out the table below and provide statements that list the specific experience of the individual in: financing, designing, constructing, interconnecting, owning, operating, and maintaining renewable energy generating or storage facilities, or other projects of similar size and technology, and
- Provide any evidence that the project participants have worked jointly on other projects.

EXPERIENCE:							
In the applicable columns below, include project details (i.e., project name, location, technology, size) and relevant job duties (role/responsibilities) and time (in years/months) spent on the project. List multiple projects if applicable.							
Participant Name:	Financing	Designing	Constructing	Interconnecting	Owning	Operating	Maintaining
1.							
2.							
3.							
...							

2.13.2 Identify those **member(s) of the team** the Proposer is submitting to meet the experience and qualifications requirement, including the Threshold Requirement. Identify those **members of the team with experience and qualifications**, including affiliates, and their principal personnel who will be involved in the project. If the Proposer consists of multiple parties, such as joint ventures or partnerships, demonstrate each member(s) firm commitment to provide services to the project (e.g., letter of intent); provide this information for each party, clearly indicating the proposed role of each party, including an ownership chart indicating direct and indirect ownership, and percentage interests in the partnership or joint venture.

2.13.3 Provide a **listing in the table format below, of all renewable energy generation or energy storage projects** the Proposer has successfully developed or that are currently under construction. Describe the Proposer's role and responsibilities associated with these projects (lead developer, owner, investor, etc.). Provide the following information as part of the response:

Project Name	Location (City, State)	Technology	Size (MW/ MWh)	Commercial Operation Date	Offtaker (if applicable)	Role & Responsibilities

		(wind, PV, hydro, plus storage, etc.)				
1.						
2.						
3.						
...						

2.14 STATE OF PROJECT DEVELOPMENT AND SCHEDULE

2.14.1 Provide a **project schedule in GANTT chart format** with complete **critical path activities** identified for the Proposal from the Notice of Selection of the Proposal to the start of Commercial Operations.

- The **schedule** must include:
 - Interconnection Requirement Study (IRS) assumptions
 - Anticipated contract negotiation period assumptions
 - Regulatory assumptions
 - Anticipated submittal and approval dates for permitting (including but not limited to environmental and archaeological compliance)
 - Siting and land acquisition
 - Cultural Resource implications and mitigation activities
 - Community outreach and engagement activities
 - Energy resource assessment
 - Financing
 - Engineering
 - Procurement
 - Facility construction including construction management events
 - Applicable reporting milestone events specified in the Mid-Tier SFC
 - Testing
 - Interconnection (including engineering, procurement, and construction)
 - Commercial Operations Date
 - All other important elements outside of the direct construction of the Project
- For each project element, list the start and end date (must be in MM/DD/YY format), and include predecessors to clearly illustrate schedule dependencies and durations.
- Proposers must also list and describe critical path activities and milestone events, particularly as they relate to the integration and coordination of the project components and the Company’s Electric System. Proposers must ensure that the schedule provided in this section is consistent with the milestone events contained in the Mid-Tier SFC and/or other agreements.

2.14.2 Describe the **construction execution strategy** including:

- Identification of contracting/subcontracting plans
- Modular construction

- Safety plans⁸
- Quality control and assurance plan
- Labor availability
- Likely manufacturing sites and procurement plans
- Similar projects where these construction methods have been used by the Proposer.

2.14.3 Provide a description of any **project activities that have been performed to date**.

2.14.4 Explain how you plan to reach **safe harbor milestones** (if applicable) and **guaranteed commercial operations**, including durations and dependencies which support this achievement.

3.0 PROPOSED CBRE PROGRAM

Provide a detailed description of the CBRE program that will be offered to eligible subscribers, including at a minimum, but not limited to, a discussion of the following:

- Financing Options
 - Subscriber fees and payments
 - Upfront payments
 - Ongoing payments
 - Public funding options
 - Extent to which subscribers will be financially responsible for any facility underperformance
- Percentage of the project's capacity that will be available to subscribers vs. unsubscribed capacity
 - Commitments to residential Subscribers
 - Commitments to Low- and Moderate- Income Customers ("LMI Customers")
- Marketing or outreach plans to advertise the proposed project/program to LMI (if applicable) and non-LMI eligible customers
- Strategies for LMI (if applicable) and non-LMI customer retention and maintaining LMI (if applicable) and non-LMI customer participation levels
- Estimated benefits to LMI (if applicable) and non-LMI customer participants
 - Expected savings
 - Payback periods
 - Payback mechanisms
 - Other benefits
- Prior experience, specifically relating to community-based renewable energy projects
- Plans for CBRE program administration
 - Strategies for subscriber retention
 - How turnover and churn of subscribers will be handled

4.0 MINOR PROPOSAL VARIATION

Proposers submitting a variation to their base variation (as allowed in RFP Section 1.8.3) must provide the **details of the variation in the below section**. In this proposal variation Section 4.0 below, Proposers must (1) complete a Proposal Summary identical to Section 2.0 of this Appendix B. The information in this table must reflect the

⁸ A document that describes the various safety procedures and practices that will be implemented on the Project and how applicable safety regulations, standards, and work practices will be enforced on the Project.

information for the variation being proposed. As specified in Section 2.2.2 above, Proposers submitting a variation must also (2) include a table summarizing the differences between the base variation and the minor variation. Additionally, Proposers must (3) identify all changes to any information provided in response to Sections 2.2.4 through 3.0 of this Appendix B for the proposal variation. If differences from any section in Sections 2.2.4 through 3.0 are not identified, the Company will assume that the information contained in the base variation (Sections 2.2.4 through 3.0) also applies to this proposal variation.

4.1 RESERVED

4.2.0 PROPOSAL VARIATION SUMMARY TABLE

Replicate the entire Summary Table here. The responses to all line items must reflect the variation being proposed.

4.2.1 through 4.3.0 RESPECTIVE SECTIONS AS NECESSARY

Identify differences to any Appendix B Section 2.1 through 3.0 here.

Note: Section 2.2.2 above requires a table summarizing the differences between the variations, if variations are proposed. For convenience, please duplicate the table summarizing the differences here.

**Certification of Counsel for Proposer
Hawaiian Electric Company, Inc., Maui Electric Company, Ltd, and Hawai'i Electric
Light Company, Inc.**

Pursuant to Section 1.7.4 of Hawaiian Electric Company, Inc., Hawai'i Electric Light Company, Inc. and Maui Electric Company, Limited's (each a "Company" and collectively, the "Companies") Request For Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Island of Maui ("RFP"), the Companies may require legal counsel who represent multiple unaffiliated proposers to sign a certification that they have not shared confidential information obtained through the representation of one proposer with any other unaffiliated proposer.

Accordingly, by signing below, I hereby acknowledge, agree and certify that:

(1) in connection with the RFP, I represent the following company that has submitted a proposal(s) for the RFP: _____ ("Proposer");

(2) irrespective of any proposer's direction, waiver or request to the contrary, I will not share a proposer's confidential information or the Company's confidential information associated with such proposer, including, but not limited to, a proposer's or Company's negotiating positions, with third parties unaffiliated with Proposer (by contract or organizational structure), including other proposers responding to the RFP;

(3) the Companies may rely on this certification for purposes of the RFP; and

(4) at the conclusion of power purchase agreement negotiations, if any, the Company may require me to sign a certificate certifying that I have not shared a proposer's confidential information or the Company's confidential information associated with such proposer, including, but not limited to, a proposer's or Company's negotiating positions, with third parties unaffiliated with Proposer (by contract or organizational structure), including other proposers responding to the RFP.

Name (print)

Law Firm (if applicable)

Signature

Date

Section 1.7.4 of the RFP provides in relevant part that:

In submitting a Proposal in response to this RFP, each Proposer certifies that the Proposal has been submitted in good faith and without fraud or collusion with any other unaffiliated person or entity. The Proposer shall acknowledge this in the Response Package submitted with its Proposal. Furthermore, in executing the NDA provided as Appendix E, the Proposer agrees on behalf of its Representatives (as defined in the NDA) that the Company's negotiating positions will not be shared with other Proposers or their respective Representatives.

In addition, in submitting a Proposal, a Proposer will be required to provide Company with its legal counsel's written certification in the form attached as Appendix B Attachment 1 certifying in relevant part that irrespective of any proposer's direction, waiver, or request to the contrary, that the attorney will not share a proposer's confidential information associated with such Proposer with others, including, but not limited to, such information such as a Proposer's or Company's negotiating positions. If legal counsel represents multiple unaffiliated proposers whose Proposals are selected for the Final Award Group, such counsel will also be required to submit a similar certification at the conclusion of power purchase agreement negotiations that he or she has not shared a proposer's confidential information or the Company's confidential information associated with such Proposer with others, including but not limited to, such information as a Proposer's or Company's negotiating positions.

**Project Interconnection - Data Request
FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

		Response
1)	Please provide a plan map of the Renewable Generation facility. Please indicate the interconnection point to the HECO system.	
2)	<p>Please provide the following generation and load information for the Renewable Generation facility:</p> <p>a. Gross and net output of the facility</p> <p>b. Expected KW and KVAR loads including, but not limited to, generators' auxiliary load curve, process load(s) profile(s), etc.</p> <p>c. Expected minimum and maximum MW and MVAR "import from" AND "export to" HECO.</p>	
3)	<p>Please provide Single-Line Diagram(s), Three-Line Diagram(s), and Protective Relay List & Trip Schedule for the generation and interconnection facilities:</p> <p>a. The Single-line diagram(s) and Three-line diagram (s) should include:</p> <p style="margin-left: 20px;">i. For main and generator step up transformer(s), please show:</p> <ul style="list-style-type: none"> • Transformer voltage and MVA ratings. • Transformer impedance(s). • Transformer winding connections and grounding. If neutrals are grounded through impedance, please show the impedance value. <p style="margin-left: 20px;">ii. The protective relaying and metering for the generators, transformers, buses, and all other main substation equipment.</p> <p style="margin-left: 20px;">iii. For the potential transformers, please indicate the type, quantity, ratio, and accuracy rating.</p> <p style="margin-left: 20px;">iv. For the current transformers, please indicate the type, quantity, ratio, and accuracy rating, and thermal rating factor.</p> <p style="margin-left: 20px;">v. Auxiliary power devices (e.g. capacitors, reactors, storage systems, etc.) and their rating(s); additional inquiries may be made to obtain technical data for these devices.</p> <p style="margin-left: 20px;">vi. For the interconnection / tie lines (overhead or underground) and the plant's generation system, please provide the following, as applicable:</p> <ul style="list-style-type: none"> • Installation details such as cross-section(s), plan and profiles, etc. • Conductor data such as size, insulation, length etc. • Continuous and emergency current ratings. • Voltage rating (nominal and maximum KV). • BIL rating. • Positive, negative, and zero-sequence impedances (resistance, reactance, and susceptance) • Capacitance or charging current. • Short-circuit current capability. <p style="margin-left: 20px;">vii. Include station power for facility and all applicable details.</p> <p style="margin-left: 20px;">viii. All applicable notes pertaining to the design and operation of the facility.</p> <p>b. The Protective relay list & trip schedule should list the protected equipment; the relay description, type, style number, quantity, ANSI Device No., and range; and the breaker(s)/switching device(s) tripped, for both the generator protection and the interconnection facilities protection.</p> <p>c. Please provide both a paper and an electronic version (e.g. dgn, dxf, or pdf) of the single-line diagram(s) and the protective relay list & trip schedule.</p> <p>d. Single-line diagrams should be provided for both the generation plant and the interconnection substation.</p>	

**Project Interconnection - Data Request
FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

	Response
4) For the PV Inverter Based Generating Facility, please provide the following data:	
a. Inverter manufacturer, Type, Size, Impedances. Attach copy of inverter data sheet.	
b. Power Factor Range Capability	
c. Inverter Reactive Power Capability Curve	
d. Auxillary loads (P, Q, Power Factor)	
e. Inverter's Internal Isolation Transformer Grounding Method, if used (i.e. effectively grounded, resonant grounded, low inductance grounded, high-resistance grounded, low-resistance grounded, ungrounded). If the transformer is not solidly grounded, provide the impedance value for the grounding neutral and the impedance for the isolation transformer.	
f. Diagram for Inverter's internal isolation transformer	
g. Switching and service restoration practice	
h. Protection data (voltage ride-through and trip settings, frequency ride-through and trip settings etc.). Include setpoint and clearing time ranges for voltage and frequency settings.	
i. Description of harmonic spectrum of inverter injection (order, magnitude)	
5) Energy Storage System, if applicable	
a. Operation characteristics	
b. Voltage level	
c. Capacity (how long and how much can the battery support)	
d. Deployment strategy/schedule	
e. Energy storage system data sheet	
6) For the PV plant's collector system, please provide the following, as applicable:	
a. Conductor data such as size, insulation, etc.	
b. Continuous and emergency current ratings.	
c. Voltage rating (nominal and maximum kV).	
d. BIL rating.	
e. Positive, negative, and zero-sequence impedances (resistance, reactance, and susceptance).	
f. Capacitance or charging current.	
g. Short-circuit current capability.	

**Project Interconnection - Data Request
FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

	Response
7) Please provide the following software models that accurately represent the Facility: (For model requirements, refer to the HECO Facility Technical Model Requirements and Review Process and PSCAD Model Requirements Rev.9)	
a. Validated PSS/E load flow model up to the point of interconnection. The PSS/E model shall include the main transformer, collection system, generator step-up transformers, inverter systems, and any other components including capacitor banks, energy storage systems, DVAR, etc. An equivalent representation of the collection system, generator step-up transformers, and inverter systems is acceptable. Documentation on the model shall be provided.	
b. Validated PSS/E dynamic model for the inverter; and other components including energy storage system, DVAR, etc. if applicable. The inverter model shall include the generator/converter, electrical controls, plant-level controller, and protection relays. Generic and Detailed models shall be provided. Documentation on the model(s) shall be provided, including the PSS/E dyre file with model parameters.	
i. Generic models shall parameterize models available within the PSS/E standard model library.	
ii. Detailed models shall be supplied by the vendor/manufacturer as user-written models. The uncompiled source code for the user-written model shall be provided to ensure compatibility with future versions of PSS/E. In lieu of the uncompiled source code, a compiled object file and applicable library files shall be provided in PSS/E versions 33 AND 34 format. Updates of the object file compatible with future PSS/E versions must be provided as requested for the life of the project as written in the power purchase agreement. Documentation shall include the characteristics of the model, including block diagrams, values, names for all model parameters, and a list of all state variables.	
c. Validated PSCAD model of the inverter; and other components including energy storage system, DVAR, auxiliary plant controllers, etc. if applicable. Documentation on the model(s) shall be provided. Refer to PSCAD Model Requirements Memo for model requirements.	
d. Overlaid plots validating the performance of the three dynamic models for a three-phase fault. Plots shall include voltage, real and reactive power, real and reactive current.	
e. Validated Aspen Oneliner short circuit model that accurately represents the facility (including energy storage system if applicable), and is valid for all faults conditions anywhere on the Utility system. Documentation on the model(s) shall be provided. (OTHERWISE SEE ADDITIONAL TABS FOR REQUIRED INFORMATION TO MODEL INVERTER AS A GENERATOR OR A VOLTAGE CONTROLLED CURRENT SOURCE)	
8) For the main transformer and generator step-up transformers, please provide:	
a. Transformer voltage and MVA ratings, and available taps. Attach copy of transformer test report or data sheet	
b. The tap settings used.	
c. The LTC Control Scheme.	
d. Transformer winding connections and grounding used. If the transformer is not solidly grounded, provide the impedance value for the grounding method.	
e. Positive, negative, and zero sequence impedance values.	
9) For the circuit breakers and fault-clearing switching devices, including the generator breakers, please provide:	
a. The voltage, continuous current and interrupting capability ratings.	
b. The trip speed (time to open).	

**Project Interconnection - Data Request
 FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

		Response
10)	For the power fuses, please provide:	
	a. The manufacturer, type, size, and interrupting capability.	
	b. The minimum melt and total clearing curves.	
11)	For the protective relaying, please provide:	
	a. Data for the CTs used with the relaying including the manufacturer, type of CT, accuracy class, and thermal rating factor.	
	b. Data for the PTs used with the relaying including the manufacturer, type of PT, voltage ratings, and quantity.	

Instructions:

Please fill in the data in the green blanks below

(Note: This does not include the internal isolation transformer, if used)

[1] Maximum rated output power = kVA

[2] Impedances in **Per Unit** based on kVA from [1]

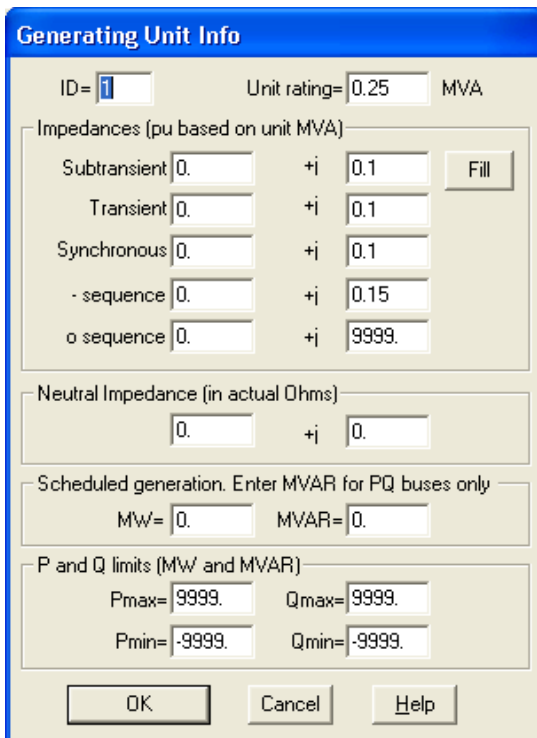
	R	X
Subtransient =	<input type="text"/>	<input type="text"/>
Transient =	<input type="text"/>	<input type="text"/>
Synchronous =	<input type="text"/>	<input type="text"/>
Negative Sequence =	<input type="text"/>	<input type="text"/>
Zero Sequence =	<input type="text"/>	<input type="text"/>

[3] Neutral impedance (if any) in actual **Ohms**:

R	X
<input type="text"/>	<input type="text"/>

NOTE: These parameters should reflect the inverter response for all types of faults at any point on the electrical system to which the inverter is connected. This includes faults at the inverter output terminals, and also on the 138 kV transmission system. If the stated parameters do not cover this range, please state the adjustments needed to these parameters to accurately represent the inverter response across this range.

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:



Instructions:

Please fill in the data in the green blanks below

- [1] Internal open circuit voltage
Magnitude = Per Unit
Angle = Degrees
- [2] AC Output Current Limit = Amps

NOTE: These parameters should reflect the inverter response for all types of faults at any point on the electrical system to which the inverter is connected. This includes faults at the inverter output terminals, and also on the 138 kV transmission system. If the stated parameters do not cover this range, please state the adjustments needed to these parameters to accurately represent the inverter response across this range.

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:

Generator Data

Generators at 200 INVERTER 0.2kV

Unit '1' On-Line

Edit
On/Off-Line
New
Delete

Internal V-Source
p.u. = 1.
Ref. angle = 0.

Current Limits (A)
A: 900. B: 0.

Power Flow Regulation
 Regulates voltage Fixed P+iQ output

Memo:

Tags: None

Done Help

Last changed Apr 18, 2010

Instructions:

Please fill in the data in the green blanks below

[1] Inverter MVA Rating: MVA

[2] Voltage-Current Characteristics:

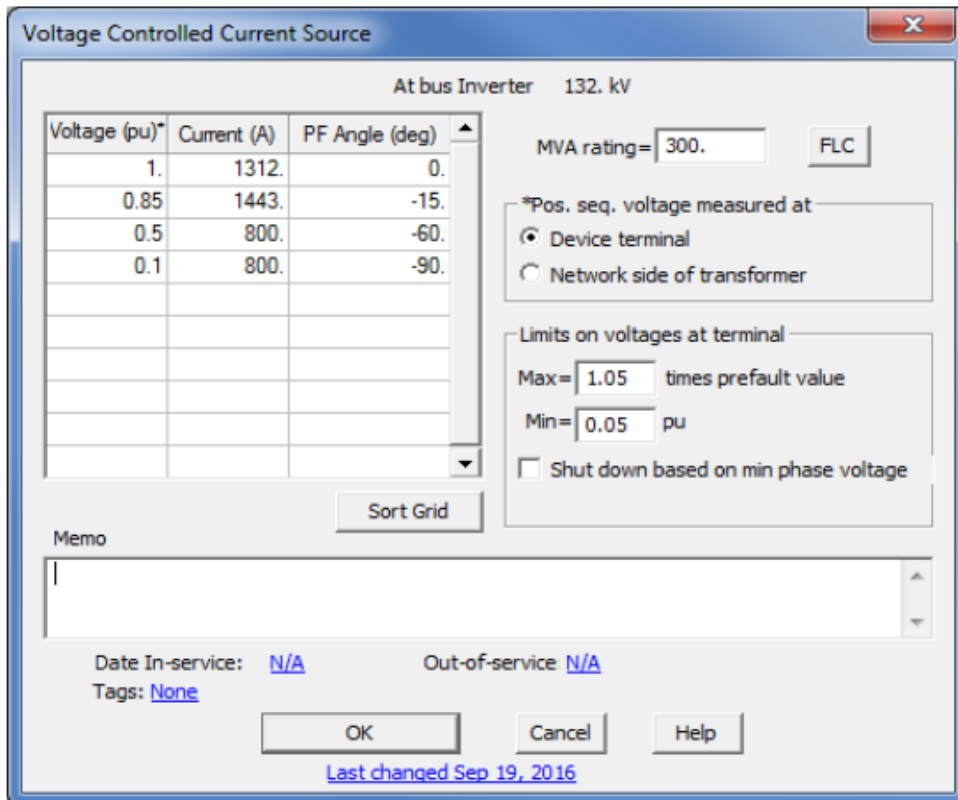
Voltage PU	Current (A)	PF Angle (deg)
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

[3] Location of Voltage Measurement: Device Terminal OR
 Network side of Transformer

[4] Maximum Voltage: Times prefault value

[5] Minimum Voltage Per Unit

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:



Instructions:

Please fill in the data in the green blanks below

(Note: This is not required if an internal isolation transformer is not used)

[1] Transformer rated power = kVA

[2] Winding Configuration
 Inverter Side = Delta/Wye
 Customer Side = Delta/Wye

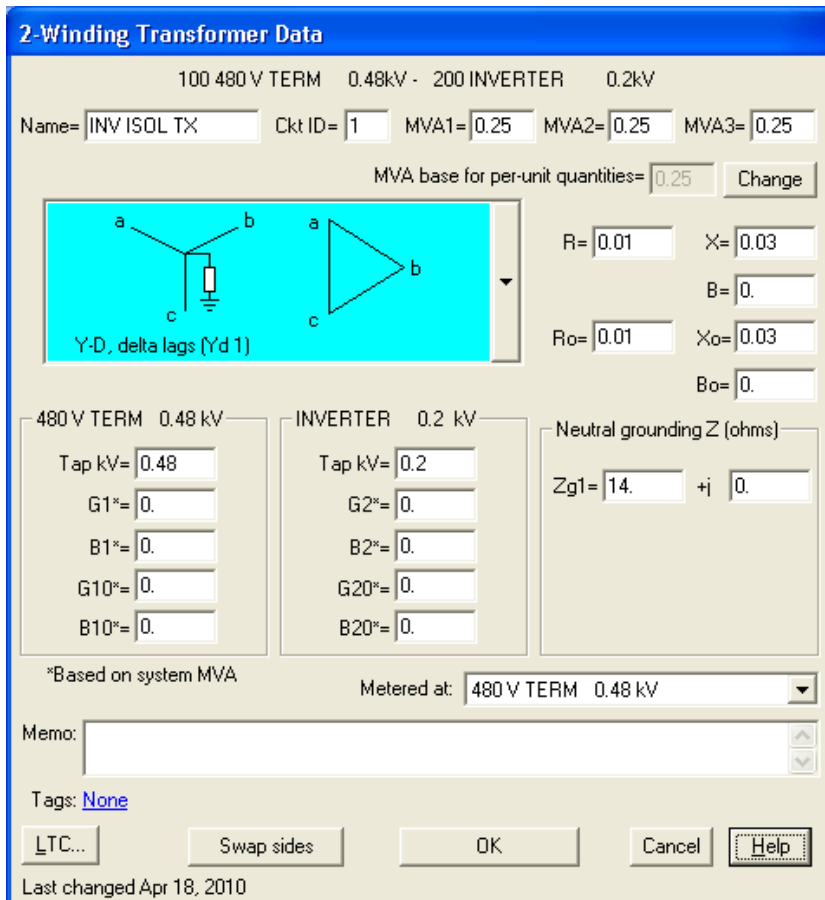
[2] Impedances in **Per Unit** based on kVA

	R	X
Positive Sequence =	<input type="text"/>	
Zero Sequence =		

[3] Neutral impedance (if any) in actual **Ohms**:

	R	X
<input type="text"/>		

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:



Appendix B Attachment 3

HECO FACILITY TECHNICAL MODEL REQUIREMENTS AND REVIEW PROCESS

March 17, 2020

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1 INTRODUCTION

This document summarizes requirements of generation facility technical model submittals for request for proposals for variable renewable dispatchable generation and energy storage and describes the review process for model submittals.

2 FACILITY TECHNICAL MODEL REQUIREMENTS

To fully investigate impacts of the proposed generation facility on Hawaiian Electric's system and correctly identify any mitigation measures, the proposed generation facility technical model, along with related technical documents, will need to be submitted as part of the project interconnection review and prior to the Interconnection Requirements Study (IRS). The generation facility technical model includes:

1. PSCAD model
2. Generic PSS/E power flow model
3. User defined PSS/E dynamic model
4. Generic PSS/E dynamic model, and
5. ASPEN model

Along with the technical models, following documents should also be submitted for review:

6. User manual for all technical models
7. Generation facility one-line diagram
8. Generation unit manufacturer datasheet
9. Generation unit reactive power capability curve
10. Overlaid generation facility technical model output data for three-phase fault and single-phase fault. (Sample plots are shown in Appendix A)

2.1 General requirements for all technical models

All technical models need to represent the whole generation facility, not only a generation unit such as one inverter. At minimum, the following equipment shall be included in the generation facility model:

1. Generation unit, such as inverter with DC side model, rotation machine with model of exciter and governor.
2. Step up transformer
3. Collection system
4. Main interconnection transformer, or GSU, with its tap changer if applicable
5. Grounding transformer
6. Conductor
7. Var compensation device, such as cap bank or STATCOM, if applicable
8. Power plant controller (not for ASPEN model)
9. Documentation
10. Gen-tie line (as applicable)

An equivalent representation of the collection system, generator step-up transformers, and inverter systems is acceptable.

2.2 Requirements for generation facility PSCAD model

In addition to the general requirements mentioned above, the generation facility PSCAD model shall satisfy requirements as described in the document "PSCAD Model Requirements Rev. 9" provided by Hawaiian Electric.

2.3 Requirements for generation facility generic PSS/E power flow model

The generation facility PSS/E power flow model shall be provided for both PSS/E version 33 and version 34. Besides the general requirements mentioned above, the following modeling data shall be provided in the model:

1. Conductor
 - a. Impedance, both positive sequence and zero sequence
 - b. Rating: Rating A – normal rating, and Rating B – emergency rating
2. Transformer
 - a. Nominal voltages of windings
 - b. Impedance data: specified R and X
 - c. Tap ratios
 - d. Min and Max tap position limits
 - e. Number of tap positions
 - f. Regulated bus
 - g. Ratings: Rate A – normal rating; Rate B – emergency rating
 - h. Winding configuration
3. Reactive power compensation, if applicable
 - a. Fixed Shunts: G-Shunt (MW), B-Shunt (MVar)
 - b. Switched Shunts: Voltage limits (Vhi and Vlow), mode of operation (fixed, discrete, continuous), regulated bus, Binit (MVar), steps and step size (MVar)
4. Generation unit
 - a. Pmax
 - b. Pmin
 - c. Qmax
 - d. Qmin
 - e. Name plate MVA
 - f. Transformer data: R Tran, X Tran, and Gentap.
 - g. Voltage control point

2.4 Requirements for generation facility user defined PSS/E dynamic model

The submitted user defined PSS/E dynamic model should meet the following requirements:

1. The generation facility PSS/E dynamic model shall be provided for both PSS/E version 33 and version 34.
2. The project shall be modeled at full output per the project's Interconnection Request.
3. User defined dynamic models must accurately model all the relevant control modes and characteristics of the equipment, such as:

- a. All available voltage/reactive power control modes
 - b. Frequency/governor response control modes
 - c. Voltage and frequency ride-through characteristics
 - d. Power plant controller or group supervisory functionality
 - e. Appropriate aggregate modeling capability
 - f. Charging mode if applicable (e.g., for a battery energy storage device)
4. Dynamic model source code (.flx) or dynamic linked library (.dll), and PSS/E dyr file shall be provided.
 5. User defined dynamic model plant-specific settings shall comply with requirements listed in the Power Purchase Agreement, including ride-through thresholds and other specified control settings if applicable.
 6. User defined dynamic models related to individual units shall be editable in the PSS/E graphic user interface. All model parameters (CONS, ICONS, and VARS) shall be accessible and shall match the description in the model's accompanying documentation.
 7. User defined dynamic models shall have all their data reportable in the "DOCU" listing of dynamics model data, including the range of CONS, ICONS, and VARS numbers. Models that apply to multiple elements (e.g., park controllers) shall also be fully formatted and reportable in DOCU.
 8. User defined dynamic models shall be capable of correctly initializing and run through the simulation throughout the range of expected steady state starting conditions without additional manual adjustments.
 9. User defined dynamic models shall be capable of allowing all documented (in the model documentation) modes of operation without error.
 10. User defined dynamic model shall be accompanied by the following documentation:
 - a. A user's guide for each model
 - b. Appropriate procedures and considerations for using the model in dynamic simulations
 - c. Technical description of characteristics of the model
 - d. Block diagram for the model, including overall modular structure and block diagrams of any sub-modules
 - e. List of plant-specific settings, which may include:
 - i. Ride-through thresholds and parameters
 - ii. Plant-level voltage controller settings
 - iii. Power ramp rate settings
 - iv. ICON flag parameters for specific control modes
 - v. Deadbands
 - vi. Initial State of Charge (SOC)
 - f. Values, names and detailed explanation for all model parameters
 - g. List of all state variables, including expected ranges of values for each variable

2.5 Requirements for generation facility generic PSS/E dynamic model

The submitted generic PSS/E dynamic model should meet the following requirements:

1. All generic PSS/E dynamic models must be standard library models in PSS/E.

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2. The generation facility PSS/E dynamic model shall be provided for both PSS/E version 33 and version 34.
3. The project shall be modeled at full output per the project's Interconnection Request.
4. Generic dynamic models must accurately model all the relevant control modes and characteristics of the equipment, such as:
 - a. All available voltage/reactive power control modes
 - b. Frequency/governor response control modes
 - c. Voltage and frequency ride-through characteristics
 - d. Power plant controller or group supervisory functionality
 - e. Appropriate aggregate modeling capability
 - f. Charging mode if applicable (e.g., for a battery energy storage device)
5. PSS/E dyr file shall be provided.
6. Generic dynamic models' plant-specific settings should comply with requirements listed in the Power Purchase Agreement, including ride-through thresholds and other specified control settings if applicable.
7. Generic dynamic models shall be capable of correctly initializing and run through the simulation throughout the range of expected steady state starting conditions without additional manual adjustments.
8. Generic dynamic models shall be accompanied by the following documentation:
 - a. A user's guide for each model
 - b. Appropriate procedures and considerations for using the model in dynamic simulations
 - c. Technical description of characteristics of the model
 - d. List of plant-specific settings, which may include:
 - i. Ride-through thresholds and parameters
 - ii. Plant-level voltage controller settings
 - iii. Power ramp rate settings
 - iv. ICON flag parameters for specific control modes
 - v. Deadbands
 - vi. Initial State of Charge (SOC)

2.6 Requirements for generation facility ASPEN model

Besides the general requirements, validation results of single phase and three-phase fault current from the generation unit represented in the generation facility ASPEN model shall be provided.

3 GENERATION FACILITY TECHNICAL MODEL REVIEW PROCESS

To review the generation facility technical model, the following procedures are performed in the PSCAD and PSS/E environment. A review of the results will be documented and provided to the Customer for confirmation of model acceptance or further model updates.

3.1 Model review in PSCAD

- 1) Review model data against “Technical memo PSCAD requirements V5.pdf” provided by Hawaiian Electric. In this step, it will be determined whether the model is complete, generation facility settings are according to the Power Purchase Agreement, and if the model can be compiled and run without any error.
- 2) Initialization test:
In this step, the generation facility PSCAD model will be determined whether the model initialization is acceptable. Hawaiian Electric requires that:
 - a. The PSCAD model shall initialize as quickly as possible (e.g. <1-3 seconds) to user defined terminal conditions.
 - b. Project PSCAD model shall initialize properly and that the same power flow and voltage conditions shall be observed between the PSCAD and PSS/E models after initialization.
- 3) Voltage and frequency ride-through tests:
In this step, the generation facility PSCAD model ride-through performance will be reviewed by performing voltage and frequency ride-through simulations in PSCAD. The review will focus on the generation facility model dynamic response during and after ride-through and generation facility trip time.
- 4) Fault simulation tests:
Two types of fault tested at the Point of Interconnection bus of the generation facility will be performed in this step.
 - i) 3-phase to ground fault with 6-cycle clearing time (same as the PSS/E ring down model test described in the following section).
 - ii) 1-phase to ground fault simulation with 6-cycle clearing time.

In this test, fault current contribution from the generation facility observed in the simulation will be reviewed by comparing it against the generation facility technical document.

3.2 Model review in PSS/E

- 1) Model data review:
Review model data based on the requirements for PSS/E power flow and dynamic model provided by Hawaiian Electric. In this step, the review determines whether the model is complete, generation facility settings is according to the PPA, and model can be compiled and run without any error.
- 2) Flat start test:

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PSS/E models shall initialize correctly and be capable of successful “flat start” testing using the 20 Second No-Fault simulation: This test consists of a 20 second simulation with no disturbance applied.

3) Ring down test:

PSS/E models shall initialize correctly and be capable of successful “ring down” testing using the 60 Second Disturbance Simulation: This test consists of the application of a 3-phase fault for 6 cycles at POI bus, followed by removal of the fault without any lines being tripped. The simulation is run for 60 seconds to allow the dynamics to settle.

4) Voltage and frequency ride-through tests:

In this step, the generation facility PSS/E model ride-through performance will be reviewed by performing voltage and frequency ride-through simulation in PSS/E. The review will focus on the generation facility model dynamic response during and after ride-through and generation facility trip time.

4 TYPICAL ISSUES IDENTIFIED FROM THE FACILITY MODEL SUBMITTALS DURING THE PAST RFP PROCESS

1. Missing documentation

Only generation technical facility models are submitted, but no model user manual or any other documentation. Without model documentation, it is very difficult to know the correct procedures of using the technical models and identifying issues during the review.

2. Model incompleteness

Often, the model of a single generation unit, such as an inverter, is submitted instead of model of the whole generation facility, which is insufficient. The model of the generation facility should include models for all equipment listed in the section of "General requirements for all technical models".

3. Settings in the model

Type issues in this category are:

- The PSCAD and PSS/E model ride-through settings are not consistent with the settings defined in the Power Purchase Agreement.
- Generation MW is not set as defined.
- Model is set for 50 Hz instead of 60 Hz

4. Model function issues

Some models do not function as expected during different test scenarios. For example:

- Fault current contribution from the generation facility is higher than what is described in the generation facility datasheet
- Generation level is not stable as settings during the initialization test
- Long time oscillation observed in the ringdown test
- Ride-through performance does not reach requirements defined in the Power Purchase Agreement

REFERENCE

- [1] New England Iso Planning procedure – Interconnection planning procedure for generation and elective transmission upgrades
- [2] ERCOT Planning Guide, 2019
- [3] PJM MOD-032 Steady State, Dynamics, and Short Circuit Modeling Data Requirements and Reporting Procedures Document

APPENDIX A: SAMPLE OVERLAID GENERATION FACILITY TECHNICAL MODEL OUTPUT PLOT FOR THREE-PHASE FAULT

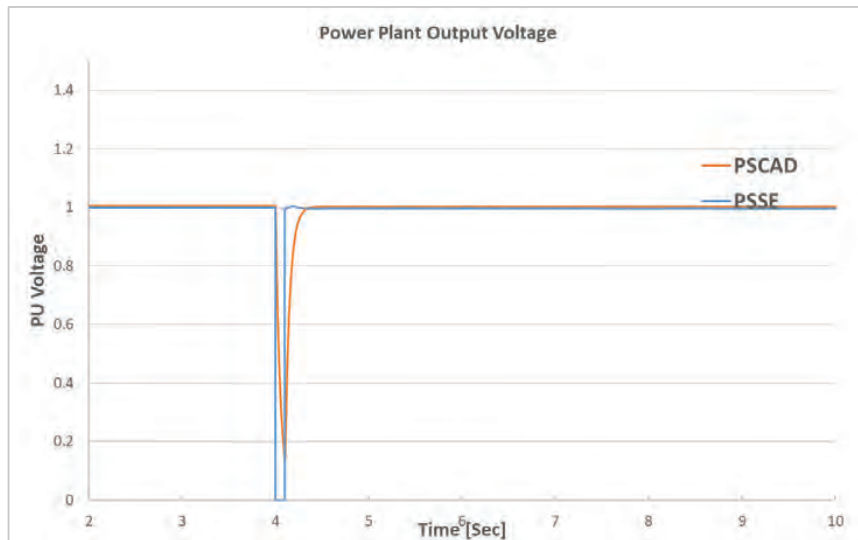


Figure 1: Overlaid plot for power plant voltage

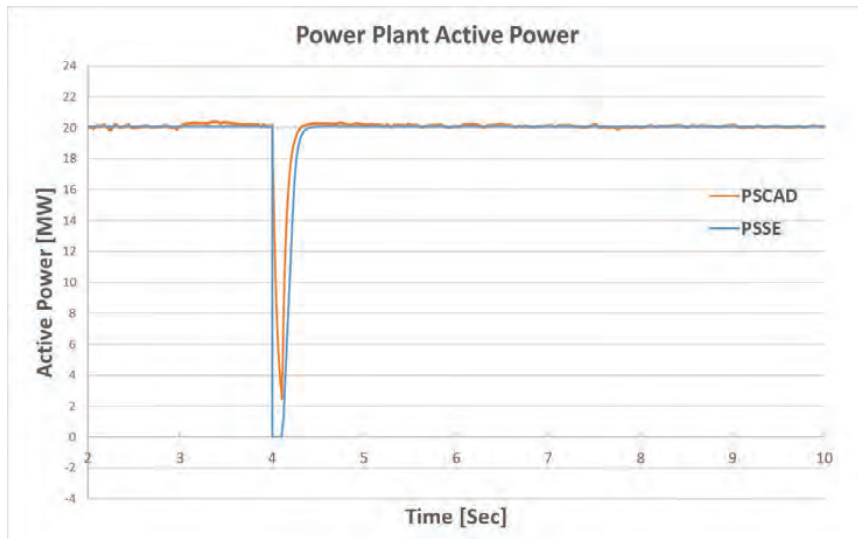


Figure 2: Overlaid plot for power plant active power generation

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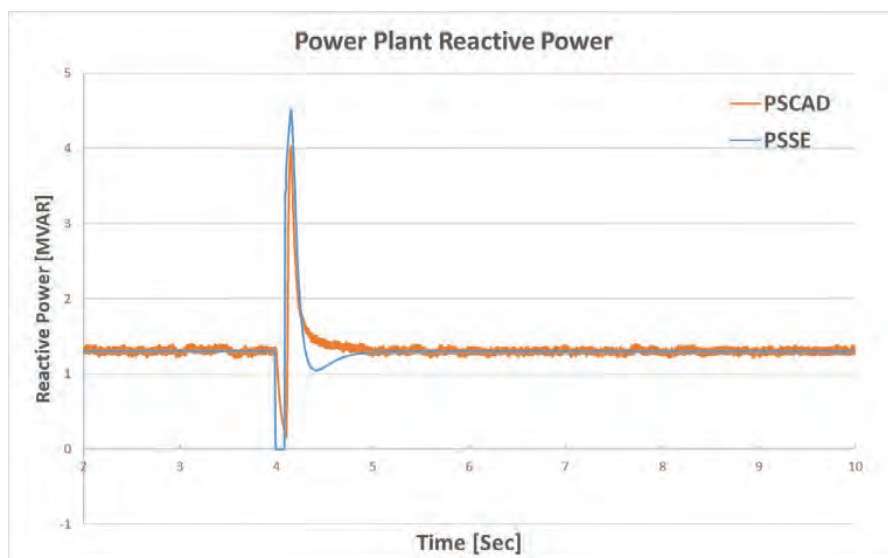


Figure 3: Overlaid plot for power plant reactive power generation

APPENDIX B: SAMPLE TEST SYSTEM TOPOLOGY INFORMATION

On weak grids such as island systems, it is important to test the models using a representative high Thevenin equivalent impedance.

A typical topology of testing circuit which represents Hawaiian Electric system for 46 kV project is shown in Figure 4. Sample 46 kV Thevenin equivalent impedance is available upon request for model testing.

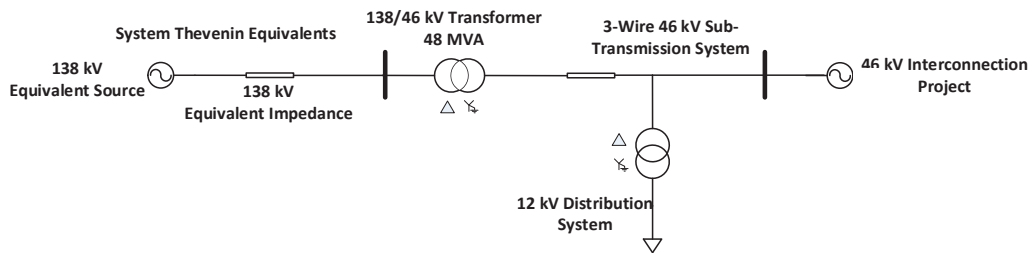


Figure 4: Testing circuit single line diagram for 46 kV project

A typical topology of testing circuit which represents Hawaiian Electric system for 138 kV project is shown in Figure 5. Sample 138 kV Thevenin equivalent impedance is available upon request for model testing.

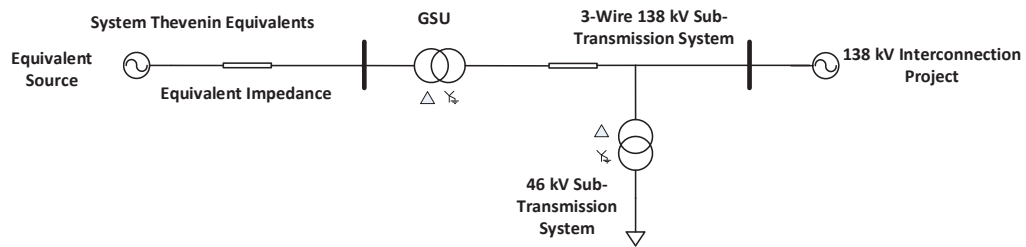


Figure 5: Testing circuit single line diagram for 138 kV project

PSCAD Model Requirements Rev. 9

Date: May 8, 2020
Prepared By: Andrew L. Isaacs
Lukas Unruh
Garth Irwin

This document includes the following attachments:

Attachment #1: PSCAD Model Test Checklist

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Introduction

Specific model requirements for a PSCAD study depend on the type of study being done. A study with a scope covering weak system interconnections, ride-through evaluation, short term¹ event response, and fast control interaction with nearby devices (for example) would require a model which has the following characteristics. Some specialty studies may require other features. Refer to “Attachment #1: PSCAD Model Test Checklist” and “Attachment #2: PSCAD Model Requirements Supplier Checklist”, appended to this document, for additional information on how these requirements may applied.

Model Accuracy Features

For the model to be sufficiently accurate, it must:

- A. *Represent the full detailed inner control loops of the power electronics.* The model cannot use the same approximations classically used in transient stability modeling, and should fully represent all fast inner controls, as implemented in the real equipment. Models which embed the actual hardware code into a PSCAD component are currently wide-spread, and this is the recommended type of model.²
- B. *Represent all control features pertinent to the type of study being done.* Examples include external voltage controllers, plant level controllers, customized PLLs, ride-through controllers, SSCI damping controllers and others. As in point A, actual hardware code is recommended to be used for most control and protection features. Operating modes that require system specific adjustment should be user accessible. Plant level voltage control should be represented along with adjustable droop characteristics. If multiple plants are controlled by a common controller, this functionality should be included.
- C. *Represent all pertinent electrical and mechanical configurations.* This includes any filters and specialized transformers. There may be other mechanical features such as gearboxes, pitch controllers, or others which should be modelled if they impact electrical performance within the timeframe of the study. Any control or dynamic features of the actual equipment which may influence behaviour in the simulation period which are not represented or which are approximated should be clearly identified.

¹ Example analysis periods could be 2 to 10 seconds from fault inception. Some studies could require longer periods.

² The model must be a full IGBT representation (preferred), or may use a voltage source representation that approximates the IGBT switching but maintains full detail in the controls. A three phase sinusoidal source representation is not acceptable. Models manually translated block-by-block from MATLAB or control block diagrams may be unacceptable because the method used to model the electrical network and interface to the controls may not be accurate, or portions of the controls such as PLL circuits or protection circuits may be approximated or omitted. Note that firmware code may be directly used to create an extremely accurate PSCAD model of the controls. The controller source code may be compiled into DLLs or binaries if the source code is unavailable due to confidentiality restrictions.

It is not recommended to assemble the model using standard blocks available in the PSCAD master library, as approximations are usually introduced, and specific implementation details for important control blocks may be lost. In addition, there is a significant risk that errors will be introduced in the process of manually assembling the model. For this type of manually assembled model, (not using a direct “real code” embedding process), extra care is required, and validation is required.

- D. *Have all pertinent protections modeled in detail for both balanced and unbalanced fault conditions.* Typically this includes various OV and UV protections (individual phase and RMS), frequency protections, DC bus voltage protections, converter overcurrent protections, and often other inverter specific protections. As in point A, actual hardware code is recommended to be used for these protection features.
- E. *Be configured to match expected site-specific equipment settings.* Any user-tunable parameters or options should be set in the model to match the equipment at the specific site being evaluated, as far as they are known. Default parameters may not be appropriate.

Model Usability Features

In order to allow study engineers to perform system analysis using the model, the PSCAD model must:

- F. *Have control or hardware options which are pertinent to the study accessible to the user.* Examples of this could include protection thresholds, real power recovery ramp rates, or SSCI damping controllers.³ Diagnostic flags (eg. flags to show control mode changes or which protection has been activated) should be visible to aid in analysis.
- G. *Be accurate when running at a simulation time step of 10 μ s or higher.* Often, requiring a smaller time step means that the control implementation has not used the interpolation features of PSCAD, or is using inappropriate interfacing between the model and the larger network. Lack of interpolation support introduces inaccuracies into the model at larger simulation time-steps. In cases where the IGBT switching frequency is so high that even interpolation does not allow accurate switching representation at 10 μ s (eg. 40 kHz), an average source approximation of the inverter switching may be used to allow a larger simulation time step².
- H. *Operate at a range of simulation time steps.* The model should not be restricted to operating at a single time step, but should be able to operate within a range (eg. 10 μ s – 20 μ s)
- I. *Have the ability to disable protection models.* Many studies result in inadvertent tripping of converter equipment, and the ability to disable protection functions temporarily provides study engineers with valuable system diagnostic information.
- J. *Include documentation and a sample implementation test case.* Test case models should be configured according to the site-specific real equipment configuration up to the Point of Interconnection. This would include (for example): aggregated generator model, aggregated generator transformer, equivalent collector branch, main step up transformers, gen tie line, and any other static or dynamic reactive resources. Test case should use a single machine infinite bus representation of the system, configured with an appropriate representative SCR, such as 2.5. Access to technical support engineers is desirable.
- K. *Have an identification mechanism for configuration.* The model documentation should provide a clear way to identify the specific settings and equipment configuration which will be used in any

³ Care should be taken to ensure that any user-settable options are not changed in a way that is not implementable in the real hardware, and that any selectable options are actually available at the specific site being considered. Discussion is recommended with the manufacturer prior to any changes being made in model configuration.

- study, such that during commissioning the settings used in the studies can be checked. This may be control revision codes, settings files, or a combination of these and other identification measures.
- L. *Accept external reference variables.* This includes real and reactive power ordered values for Q control modes, or voltage reference values for voltage control modes. Model should accept these reference variables for initialization, and be capable of changing these reference variables mid-simulation, ie. dynamic signal references.
 - M. *Be capable of initializing itself.* Once provided with initial condition variables, the model must initialize and ramp to the ordered output without external input from simulation engineers. Any slower control functions which are included (such as switched shunt controllers or power plant controllers) should also accept initial condition variables if required.
 - N. *Have the ability to scale plant capacity.* The active power capacity of the model should be scalable in some way, either internally or through an external scaling transformer⁴. This is distinct from a dispatchable power order, and is used for modeling different capacities of plant or breaking a lumped equivalent plant into smaller composite models.
 - O. *Have the ability to dispatch its output to values less than nameplate.* This is distinct from scaling a plant from one unit to more than one, and is used for testing plant behaviour at various operating points.
 - P. *Initialize quickly.* Model must reach its ordered initial conditions as quickly as possible (for example <5 seconds) to user supplied terminal conditions.

Study Efficiency Features

In addition, the following elements are required to improve study efficiency, model compatibility, and enable other studies which include the model to be run as efficiently as possible. If these features are not supported, additional discussion is required⁵:

- Q. Model should be compatible with Intel Fortran compiler version 12 and higher.
- R. Model should be compatible with PSCAD version 4.5.3 and higher.
- S. Model supports multiple instances of its own definition in the same simulation case.
- T. Model supports the PSCAD “timed snapshot” feature accessible through project settings.
- U. Model supports the PSCAD “multiple run” feature.
- V. Model does not use or rely upon global variables in the PSCAD environment.
- W. Model should not utilize multiple layers in the PSCAD environment, including ‘disabled’ layers.

⁴ A free publicly available scaling transformer suitable for this purpose is available in the E-Tran library.

⁵ Electrenix has parallelization tools available (E-Tran Plus for PSCAD) which can circumvent compatibility concerns in some cases.

Attachment #1: PSCAD Model Test Checklist

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Purpose

This document is a test checklist meant to accompany “PSCAD Model Requirements Rev. 9” provided above and “Attachment #2: PSCAD Model Requirements Supplier Checklist”. The procedures provided in this document are intended to provide an indication of the core model accuracy, performance, and usability features specified in the model requirements. These procedures cannot ultimately prove that the model is compliant with all requirements, as black box models usually hide the details of the equipment controls and protection. It is recommended that the equipment manufacturer supply additional confirmation that the model meets each individual requirement. The requirements in this document do not necessarily represent interconnection criteria for specific individual systems, and may be supplemented or adjusted based on interconnection region.

The tests outlined here are considered “basic”, and may be supplemented by more rigorous testing, including various fault types, depths, and durations, as well as more extensive protection testing and benchmarking against phasor models. This document is not intended to be a guide for thorough benchmarking between PSCAD, PSS/E, and actual equipment, and is subject to revision as the state of the art in EMT modeling evolves.

<i>Model test Summary</i>	
Model Test date:	
Project Name:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file:	
Model Files supplied:	

Verification Procedure and Checklist

		Pass/Fail	Comments
<i>Vendor and site specific model verification</i>			
1a	The Vendor's name and the specific version of the model should be clearly observable in the .psc model file.		
1b	Documentation and supporting model filenames should not conflict with model version shown in the .psc model file.		
1c	Model is supplied with a test circuit which is configured for the site specific application. ⁶		
<i>"Real Code" model verification</i>			
2a	Controls are black-boxed, and no PSCAD master library control blocks are visible within control circuits. ⁷ If the model is not based on "real code", a separate validation report is required showing model comparison against hardware tests. ⁸		
<i>Model usability verification</i>			
3a	Model uses a timestep greater than 10 μs ⁹		
3b	Model allows a variation in simulation timestep		
3c	Model compiles using Intel FORTRAN version 12		
3d	Model initializes in 5 seconds or less with a POI level SCR of 2.5. Real power, reactive power, and RMS voltage should reach steady state by this time.		
3e	Model allows multiple instances of itself to be run together in the same case ¹⁰		
<i>Model electrical configuration verification</i>			
4a	Plant level electrical single line diagram (SLD) is included.		

⁶ The test circuit should model all relevant electrical components of the plant and contain a system equivalent. Parameters will be assumed to be site-specific, unless there are obvious indications otherwise, such as an incorrect grid base frequency.

⁷ Black-boxing of controls to a high level does not guarantee that real-code is embedded into the model, however the visibility of PSCAD master-library control blocks in the inner control loops (PLL, inner current controllers, etc.) suggest that the model is generic in nature. Model documentation may contain information on use of real-code in the model.

⁸ All aspects of the controller operation are required to be validated by utilizing a "hardware in loop" platform or other hardware test systems. Model should not be validated against other software models. Validations should include control responses to various types of faults, changes in power and voltage references, changes in system frequency, testing frequency response in sub and super-synchronous ranges, and testing of protection operation. Tests should also be performed under a variety of system strengths, including very weak systems. Other tests may also be required. The validation report is required along with any model updates that result from the more rigorous validation tests.

⁹ Models with timesteps less than 10 μs may be acceptable in situations where a small timestep does not significantly increase the runtime of the total simulation

¹⁰ Depending on specific application and whether E-Tran Plus for PSCAD is allowed to be used to overcome the limitation, this requirement may be waived.

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4b	Generator step-up transformer(s) included, with impedance between 5 and 10% on generator base, and matches SLD. ¹¹		
4c	Lumped collector equivalent(s) included, with total charging equal to between 0.5 and 5% of plant rating, and matches SLD. ¹¹		
4d	Substation transformer(s) included, rated appropriately for plant size, and impedance between 6 and 12% on transformer base, and matches SLD. ¹¹		
4e	Model can be scaled to represent any number inverters/turbines, either using a scaling transformer or internal scaling.		
4f	All external devices included in the plant (such as STATCOMs) include appropriate models.		
<i>Plant controller verification</i>			
5a	Model includes power plant controller (PPC)		
5b	PPC accepts an external active power setpoint.		
5c	PPC accepts a voltage setpoint.		
5d	PPC has a mechanism to implement a settable voltage droop.		
5e	Overall plant responds to frequency changes by increasing or decreasing its active power as appropriate. This may be accomplished either at an inverter level or via the PPC. ¹²		
5f	Model initializes to the setpoints specified in the PPC. If droops or deadbands are utilized, the initial values may differ from the setpoints. ¹³		
5g	If external voltage control devices (STATCOM/DVAR, SVC, MSCs) are included in the plant, ensure that the voltage control of these devices is coordinated with the PPC, with no potential for VAR looping or oscillations.		
<i>Basic performance verification¹⁴</i>			
6a	Instantaneous voltage and current waveforms have minimal distortion, and no oscillations are observed.		

¹¹ Impedance range is for sanity checking only. Impedances outside this range may be allowed.

¹² Non-compliance with this item may not require model revision as frequency response may not be required in PSCAD models by some utilities. In this case, a description of the under/over frequency response capabilities of the actual equipment should be provided by the manufacturer.

¹³ If voltage control with droop is implemented, it is preferred that the PPC model requests an initial Q value to match the voltage setpoint. If no initial Q is requested, the voltage setpoint can be biased by the initial Q before it is sent to the PPC. If a non-zero deadband is included in the voltage controller, the deadband can also be considered in the voltage setpoint sent to the PPC.

¹⁴ Performance testing is recommended with a POI level SCR of 2.5 as this is a representative system condition seen during weak system studies. Testing may be performed at higher SCRs if the stable operating SCR of a model is known to be above 2.5.

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6b	Model is able to ride-through and recover from a temporary (no line outage or drop in SCR), 6-cycle, zero-impedance, three-phase fault at the high side of the station transformer, with a POI level SCR of 2.5.		
6c	Model responds to a step change in PPC voltage setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. (Various systems may have specific speed requirements, which should be met)		
6d	Model responds to a step change in PPC active power setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. ¹⁵		
<i>Basic protection verification</i> ¹⁶			
7a	Protection settings are implemented. These could be available as inputs in the model, or hard-coded in the black-boxed controls. ¹⁷		
7b	Option to disable protection models is present. ¹⁸		
7c	Model trips or blocks when terminal voltage rises above 1.3 pu for 1.5 second. ¹⁹		
7d	Model trips or blocks when terminal voltage falls below 0.2 pu for 1.5 second. ¹⁹		
7e	Model clearly displays trip / diagnostic signals indicating the status of all pertinent protection elements		
<i>Documentation</i>			
8a	Model documentation states compliance with "PSCAD Model Requirements Rev. 9 Rev. 9" ²⁰ , or is supplied with a completed PSCAD Model Requirements Supplier Checklist.		
8b	Model documentation includes instructions for setup and running of the model, including the recommended range of simulation timesteps. Documentation should give a clear description of trip / operation code signals produced by model.		

¹⁵ Different response time criteria may apply depending on specific interconnection region.

¹⁶ There are many protection functions which should be modelled, per footnote 1, and these basic tests will not be proof that these are modelled.

¹⁷ If settings are not visible in model or documentation, verification that protection settings are implemented in the PSCAD model should be received from the manufacturer.

¹⁸ Non-compliance may not require model revision as many studies do not require testing with protection settings disabled.

¹⁹ Non-compliance with this item should result in verification of protection settings implementation from the manufacturer, as some models may have capabilities beyond what is listed here.

²⁰ Non-compliance may be waived in systems which do not require compliance with the model requirements document.

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Purpose

This document is a model requirements checklist which should be completed by the supplier of the model and submitted alongside each PSCAD model. This document accompanies the “PSCAD Model Requirements Rev. 9” document above (PMR), which should be used for further reference to describe the requirements associated with each point. Generic testing of the model may be done using “Attachment #1: PSCAD Model Test Checklist”, which may be used as a reference.

Model supplier must review every item in the checklist and indicate compliance for each item. If the supplied model does not meet any of the requirements an explanation of the deficiency should be provided in the comments column.

<i>Model Submission Summary (to be completed by model supplier)</i>	
Submission date:	
Project Name:	
Primary contact information for model related questions:	
Secondary contact information for model related questions:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file(s):	
Model Files supplied:	

Model Requirements Checklist				Model Complies? (Yes/No)	Comments
1	<i>Model Accuracy Features</i>				
1.1	Power electronic controls are modelled by interfacing with actual firmware code from the inverter (“real code” model), or includes detailed validation report.	A, B			
1.2	Operating modes which require system specific adjustment are accessible.	B			
1.3	Plant level controller is included. ²¹	B			
1.4	Model is capable of controlling frequency ²²	B			
1.5	Includes pertinent electrical and mechanical features, such as gearboxes, pitch controllers, or other features which impact the plant performance in the simulation period. ²³	C			
1.6	All protections which could impact ride-through performance are modelled in detail.	D			
1.7	Model is configured for the specific site being evaluated, as far as they are known.	E			
2	<i>Model and Project Documentation</i>				
2.1	Model includes documentation.	J			
2.2	Documentation includes instruction for setup and running the model.	J			

²¹ If the plant is part of a multi-plant control scheme, a description of the overall scheme should be provided, and corresponding PPC models should be configured to control multiple plants accordingly.

²² Frequency control model requirements may vary by region. Example response time may be less than 10 seconds.

²³ Simulation period may vary depending on the model use, but 10 seconds of simulation following an event such as a fault is a typical period.

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2.3	Model is supplied with a sample test case including site specific plant representation.	J	
2.4	Plant single line diagram is provided, and aligns with model	J	
2.5	Model documentation provides a clear way to identify site-specific settings and equipment configuration.	K	
3	<i>Model Usability Features</i>		
3.01	Control or hardware options are accessible to the user as applicable.	F	
3.02	Diagnostic flags are visible to the user.	F	
3.03	Model uses a timestep greater than 10 μ s.	G	
3.04	Model allows a range of simulation timesteps (ie. not restricted to a single timestep).	H	
3.05	Protection model may be disabled for troubleshooting	I	
3.06	Model accepts external reference variables for active and reactive power and voltage setpoint, and these may be changed dynamically during the simulation.	L	
3.07	Model is capable of initializing itself.	M	
3.08	Active power capacity is scalable.	N	
3.09	Active power is dispatchable.	O	
3.10	Model reaches setpoint P, Q, and V in 5 seconds or less	P	
3.11	Model compatible with Intel FORTRAN version 12 and higher.	Q	
3.12	Model compiles using PSCAD version 4.5.3 or higher.	R	
3.13	Model supports multiple instances of its own definition in a single PSCAD case.	S	
3.14	Model supports PSCAD "snapshot" feature.	T	

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3.15	Model supports the PSCAD “multiple run” feature.	U	
3.16	Model does not use PSCAD global variables.	V	
3.17	Model does not use PSCAD layer functionality	W	

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Transmission and Distribution Planning Division - Interconnection Services Department
Simulation Tests
CBRE RFP Interconnection Requirement Study-System Impact Study
Date: July 7, 2020

1. Introduction

This document describes the simulation tests that Hawaiian Electric IRS study consultants will perform to check the models submitted for CBRE IRS. Results of these tests, combined with other checks on project input data and model parameters, will determine if the models are acceptable for the IRS studies. The models to be tested are PSS E user-written model, PSCAD model and ASPEN short-circuit model for each project.

It is recommended that the model submitters should also perform these tests to self-check on your models, so that your models will become acceptable for the IRS study in a timely manner.

2. Separate Models Required for Grid Following Mode and Grid Forming Mode

For the CBRE IRS, modeling of inverter Grid Forming capabilities may be required. For each project, separate models should be submitted: one with the project in Grid Forming (GFM) mode (if applicable), and the other with the project in Grid Following (GFL) mode. This requirement applies to all models mentioned above.

3. General Requirements

All submitted models should be accompanied by proper documentation.

There should be a reasonable match between the PSS E user-written model and the PSCAD model responses for the simulation tests performed for both models.

4. List of Simulation Tests

4.1 GFL Mode Simulation Tests

4.1.1 Tests to be performed for PSS E models

- a. Flat run in a two-machine system (one machine is a synchronous machine, e.g., GENCLS model, and the other machine is a project's model.)
- b. Ringdown (3ph-ground fault simulation test) in a two-machine system.



GFL-Tests to be performed for PSS E models - continued

- c. Voltage ride-through and response in a two-machine system.
- d. Frequency ride-through and response in a two-machine system.
- e. Weak grid operation in a two-machine system
Gradually increase/decrease MVA of the synchronous machine within a range and check if the project's model is able to work with the studied MVA range.
- f. Simulation in a relevant HECO island system model for a couple of selected faults
The purpose here is to identify potential issues with a project's PSS E model ahead of dynamic stability analysis to limit study delays due to model issues.

Note: also refer to "Siemens PTI Model Review process_200317.pdf".

4.1.2 Tests to be performed for PSCAD models only (includes model adequacy and documentation checks)

- g. Tests and checks outlined in "PSCAD Requirements Rev 9 May 2020.pdf", inclusive of ringdown, voltage and frequency ride-through tests.



4.2 GFM Mode Simulation Tests

4.2.1 Tests to be performed for both PSS E and PSCAD models

Test notes:

- Applicable for projects which include grid-forming BESS only
- Assumption is that BESS has available energy and is dispatched suitably for the tests (i.e. Not at current limit)

- a. Able to black start and operate in island mode

Test sequence: energize main power transformer from project side, then connect project to a load, then apply a bus fault at the POI, then remove the fault. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbances.

- b. Loss of the last synchronous machine

Test system will be a three-machine system including: a synchronous machine modeled by GENROU with a simple excitation system model (e.g., SCRX) and a simple governor model (e.g., TGOV1), a load with both real and reactive components, and duplicates of a project's model. Duplicates of a project's model are utilized here to check if the project is able to share real and reactive power properly with other generators. Test event: trip the synchronous generator. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbance.

- c. Weak grid operation

Test system is the two-machine system. Gradually increase/decrease MVA of the synchronous machine within a range and check if the project's model is able to work with the studied MVA range.

- d. Able to operate in harmony with other converter resources and synchronous machines

Test system is the three-machine system including: a synchronous machine modeled by GENROU with a simple excitation system model and a simple governor model, a load with both real and reactive components, and duplicates of a project's model. Simulation tests to be performed may include load step up/down, ringdown, voltage ride through and frequency ride-through tests. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbances.



GFM Mode Simulation Tests – Tests to be performed for both PSS E and PSCAD models - continued

Particularly related to frequency control characteristics, we will test for configurable frequency droop control and configurable deadband characteristics. The frequency deadband should be settable in the range from +/- 0.01 Hz to +/- 1.0 Hz and the frequency droop shall be settable in the range of 0.1% to 10% with a typical value of 4%. A sample characteristic of frequency droop control with deadband is shown in Figure 1.

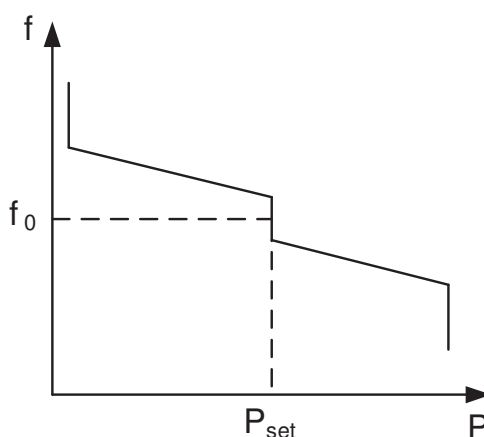


Figure 1 – Frequency Droop Control Characteristic with Deadband

e. Switching between GFL mode and GFM mode

Test system is the two-machine system. Test sequence: energize main power transformer from project side, then connect project to a load. At this point, the project will be operating in island mode, performing frequency control. Then switch in the synchronous generator; the project will be operating in power/frequency droop control mode. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbances.

4.2.2 Tests to be performed for PSS E models only

a. Reduction in frequency deviation in GFM mode

Test system will be a relevant HECO island system model. Test event is loss of a large generator. Project model will be in GFL mode and GFM mode. Result: less degree of frequency deviation is expected when project is in GFM mode than when the project is in GFL mode.



4.3 ASPEN Model Check

A review of the ASPEN models will be performed. As mentioned above, two models are expected for each project: one model for GFL mode, and the other for GFM mode. Documentation associated with the models should be provided. The model review will check if the components of a project are modeled properly, such as transformers, equivalent collector system, equivalent generator, etc., and that the model data are consistent to the PSS E and PSCAD model data. A fault simulation test will also be performed in a two-machine system. Total current at the fault location and contribution from each machine will be reviewed and documented.



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Date: March 17, 2020

From: Osazuwa Oriakhi, Wenchun Zhu and Kavita Shenoi, Siemens PTI

RE: HECO IRS Model Review Process

Message from Interconnection Services: This document shows you an example of the model data review and tests that a study consultant performs on your model data submittal under the Interconnection Requirement Study, System Impact Study (IRS SIS Agreement). The Test Package that you are receiving is repeated for the IRS. By performing these tests as a Do-it-Yourself (DIY), model data submittals when we receive them for the IRS SIS are understood to be accurate and have usability and efficiency features to integrate the facility model data with the Company's system model data and commence the IRS SIS analyses in a prompt and efficient manner.

Siemens PTI performs the following data checks and tests as a part of our Model review process.

A. Steady State Data Review

Siemens PTI will review the ratings and impedances of all equipment in the ASPEN, PSS®E and PSCAD models and check for discrepancies. Table 1 below shows the comparison of power flow data for all equipment in the PSS®E and PSCAD models.

Table 1. Steady State Data Review

Equipment	Comments
Gen-Tie line	PSS®E, PSCAD and ASPEN models should match
Main Power Transformer Impedance	PSS®E, PSCAD and ASPEN models should match
Main Power Transformer Configuration	PSCAD and ASPEN models should match
PV Collector System Data	PSS®E, PSCAD and ASPEN models should match
BESS Collector System Data	PSS®E, PSCAD and ASPEN models should match
Inverter Pad Mount Transformer Impedance	PSS®E, PSCAD and ASPEN models should match
Inverter Pad Mount Transformer Configuration	PSCAD and ASPEN models should match
Inverter Power Flow Data	PSS®E and PSCAD models should match
Voltage Control Point	PSS®E and PSCAD models should match

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B. Dynamic Model Data Review

There are three types of models which show the transient/dynamic behavior of the generation facility:

1. A PSS®E user-written dynamic model which is a detailed model of the specific inverters and controls provided by the manufacturer.
2. A PSS®E generic model which utilizes PSS®E library models to specify the dynamic behavior of the facility.
3. A PSCAD model which is a detailed transient model of the inverters and controls

Siemens PTI will compare the various dynamic model parameters across the three models and note any discrepancies in the data fields shown in Table 2.

Table 2. Comparison of Dynamic Model Parameters

Parameters	Comments
Power Plant Controller (PPC)	Review number of PPCs
Control Flags	PSS®E and PSCAD control flags should match.
Control Bus/Point of Measurement	Control buses should match in PSS®E and PSCAD models.
Frequency Control Dead Band	The frequency thresholds for primary and secondary control should match in the PSCAD and PSS®E models.
Initial State of Charge (SOC)	Make sure the initial state of charge is set up correctly to prevent initialization issues.
Voltage and Frequency Ride Through Settings	The voltage and frequency ride through settings should match in the PSS®E user-written, PSS®E generic and PSCAD models.
P/Q priority data	The P/Q priority flags should match in the PSS®E user-written, PSS®E generic and PSCAD models

C. Model tests

Siemens PTI will perform the following tests to check the active power, reactive power, voltage and frequency responses of the generation facility and review if the three models (PSS®E user-written, PSS®E generic and PSCAD models) show consistent responses.

1. **Flat Run Test:** This is a no-disturbance simulation to check a model's initialization. This test is applicable to all three types of models.
2. **Ring Down Test:** In this simulation, a fault is placed at the facility's POI for a duration of 6-cycles. The fault is subsequently cleared, and the post-disturbance response of the facility is observed. This test is applicable to all three types of models.
3. **High and Low Frequency Response Test:** In these simulations, the system frequency is varied to test the facility's responses to grid's frequency excursions. In the PSS®E tests, high and low frequency excursions are simulated to mimic the frequency ride through thresholds specified in the PPA and the response of the facility is observed. Both the frequency ride-through capability of the facility and its active power response to frequency excursions are tested in the PSS®E simulations.

In the PSCAD simulations, the focus is on testing the facility's active power responses to frequency excursions, and not on testing the frequency ride-through capability. However, it should be noted that the duration of the frequency excursions in the PSCAD tests are well-

Appendix B Attachment 3

within the no-trip zones according to the PPA, and so the facility is not expected to trip during these simulations. Table 3 and Table 4 show the frequency excursions that were simulated in the PSCAD tests.

Table 3 Frequency Excursions for PSCAD High Frequency Response Test

Frequency level (Hz)	Duration (secs)
60.1	2.0
63.0	2.0

Table 4 Frequency Excursions for PSCAD Low Frequency Response Test

Frequency level (Hz)	Duration (secs)
59.9	2.0
56.0	2.0

4. **High and Low Voltage Ride-through and Response Tests:** In these simulations, the POI voltage is varied to test the facility's ride-through capabilities and responses to POI voltage excursions. In the PSS[®]E simulations, two sets of tests are performed: one for testing the ride-through capabilities and the other for testing the responses to voltage excursions. These two sets of tests are similar, except that the grid equivalent representation is different. For the ride-through tests, the grid equivalent is represented by a generator with a very large MVA, which connects to the POI bus directly. For the voltage excursion response tests, the grid equivalent is represented by a 500 MVA generator which connects to the POI through a branch with a reactance of 0.1 p.u.

In the PSCAD simulations, the focus is on testing the facility's reactive power responses to POI voltage excursions, and not on testing the voltage ride-through capability. However, it should be noted that the duration of the voltage excursions in the PSCAD tests are well-within the no-trip zones according to the PPA, and so the facility is not expected to trip during these simulations.

Table 5 shows the voltage excursions that will be simulated in the PSCAD tests.

Table 5 POI Voltage Excursions for PSCAD Voltage Response Test

POI Voltage level (pu)	Duration (secs)
1.20	0.8
1.10	2.0
0.88	2.0
0.70	2.0

Each of the above discussed tests were performed for the following three generation dispatches:

- **PV output only:** In this dispatch, the PV unit is at maximum output and the BESS unit is online at 0 MW.
- **BESS output only:** In this dispatch, the BESS unit is discharging at maximum output and the PV unit is online at 0 MW.

Appendix B Attachment 3

- **PV charging BESS:** In this dispatch, the PV unit is at its maximum output and is charging the BESS at its minimum level.

D. Expected Model Performance

1. Matching steady-state model parameters between the PSS®E user-written, generic models and the PSCAD model.
2. Matching control options between the three types of models.
3. Matching voltage and frequency ride-through parameters between the three types of models. The settings should meet the ride-through requirements specified in the PPA.
4. Flat run results do not show any movement for any of the three models.
5. Ring-down simulation results show stable and proper responses, and the responses from the three models should show reasonable matches.
6. Ride-through simulation results should show stable and proper responses, and the responses should show reasonable matches. The ride through performance should meet the PPA requirements.

E. Model Review Reporting Requirements

1. Simulation tests should be performed using the python scripts provided by Siemens PTI, and should be readily reproducible.
2. Discuss model review results.
3. Include simulation plots for the simulation tests discussed above.
4. Related to high and low frequency ride through tests, document frequency response droops shown in the simulations.

PSCAD Model Requirements Rev. 9

Date: May 8, 2020
Prepared By: Andrew L. Isaacs
Lukas Unruh
Garth Irwin

This document includes the following attachments:

Attachment #1: PSCAD Model Test Checklist

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Introduction

Specific model requirements for a PSCAD study depend on the type of study being done. A study with a scope covering weak system interconnections, ride-through evaluation, short term¹ event response, and fast control interaction with nearby devices (for example) would require a model which has the following characteristics. Some specialty studies may require other features. Refer to “Attachment #1: PSCAD Model Test Checklist” and “Attachment #2: PSCAD Model Requirements Supplier Checklist”, appended to this document, for additional information on how these requirements may applied.

Model Accuracy Features

For the model to be sufficiently accurate, it must:

- A. *Represent the full detailed inner control loops of the power electronics.* The model cannot use the same approximations classically used in transient stability modeling, and should fully represent all fast inner controls, as implemented in the real equipment. Models which embed the actual hardware code into a PSCAD component are currently wide-spread, and this is the recommended type of model.²
- B. *Represent all control features pertinent to the type of study being done.* Examples include external voltage controllers, plant level controllers, customized PLLs, ride-through controllers, SSCI damping controllers and others. As in point A, actual hardware code is recommended to be used for most control and protection features. Operating modes that require system specific adjustment should be user accessible. Plant level voltage control should be represented along with adjustable droop characteristics. If multiple plants are controlled by a common controller, this functionality should be included.
- C. *Represent all pertinent electrical and mechanical configurations.* This includes any filters and specialized transformers. There may be other mechanical features such as gearboxes, pitch controllers, or others which should be modelled if they impact electrical performance within the timeframe of the study. Any control or dynamic features of the actual equipment which may influence behaviour in the simulation period which are not represented or which are approximated should be clearly identified.

¹ Example analysis periods could be 2 to 10 seconds from fault inception. Some studies could require longer periods.

² The model must be a full IGBT representation (preferred), or may use a voltage source representation that approximates the IGBT switching but maintains full detail in the controls. A three phase sinusoidal source representation is not acceptable. Models manually translated block-by-block from MATLAB or control block diagrams may be unacceptable because the method used to model the electrical network and interface to the controls may not be accurate, or portions of the controls such as PLL circuits or protection circuits may be approximated or omitted. Note that firmware code may be directly used to create an extremely accurate PSCAD model of the controls. The controller source code may be compiled into DLLs or binaries if the source code is unavailable due to confidentiality restrictions.

It is not recommended to assemble the model using standard blocks available in the PSCAD master library, as approximations are usually introduced, and specific implementation details for important control blocks may be lost. In addition, there is a significant risk that errors will be introduced in the process of manually assembling the model. For this type of manually assembled model, (not using a direct “real code” embedding process), extra care is required, and validation is required.

- D. *Have all pertinent protections modeled in detail for both balanced and unbalanced fault conditions.* Typically this includes various OV and UV protections (individual phase and RMS), frequency protections, DC bus voltage protections, converter overcurrent protections, and often other inverter specific protections. As in point A, actual hardware code is recommended to be used for these protection features.
- E. *Be configured to match expected site-specific equipment settings.* Any user-tunable parameters or options should be set in the model to match the equipment at the specific site being evaluated, as far as they are known. Default parameters may not be appropriate.

Model Usability Features

In order to allow study engineers to perform system analysis using the model, the PSCAD model must:

- F. *Have control or hardware options which are pertinent to the study accessible to the user.* Examples of this could include protection thresholds, real power recovery ramp rates, or SSCI damping controllers.³ Diagnostic flags (eg. flags to show control mode changes or which protection has been activated) should be visible to aid in analysis.
- G. *Be accurate when running at a simulation time step of 10 μ s or higher.* Often, requiring a smaller time step means that the control implementation has not used the interpolation features of PSCAD, or is using inappropriate interfacing between the model and the larger network. Lack of interpolation support introduces inaccuracies into the model at larger simulation time-steps. In cases where the IGBT switching frequency is so high that even interpolation does not allow accurate switching representation at 10 μ s (eg. 40 kHz), an average source approximation of the inverter switching may be used to allow a larger simulation time step².
- H. *Operate at a range of simulation time steps.* The model should not be restricted to operating at a single time step, but should be able to operate within a range (eg. 10 μ s – 20 μ s)
- I. *Have the ability to disable protection models.* Many studies result in inadvertent tripping of converter equipment, and the ability to disable protection functions temporarily provides study engineers with valuable system diagnostic information.
- J. *Include documentation and a sample implementation test case.* Test case models should be configured according to the site-specific real equipment configuration up to the Point of Interconnection. This would include (for example): aggregated generator model, aggregated generator transformer, equivalent collector branch, main step up transformers, gen tie line, and any other static or dynamic reactive resources. Test case should use a single machine infinite bus representation of the system, configured with an appropriate representative SCR, such as 2.5. Access to technical support engineers is desirable.
- K. *Have an identification mechanism for configuration.* The model documentation should provide a clear way to identify the specific settings and equipment configuration which will be used in any

³ Care should be taken to ensure that any user-settable options are not changed in a way that is not implementable in the real hardware, and that any selectable options are actually available at the specific site being considered. Discussion is recommended with the manufacturer prior to any changes being made in model configuration.

- study, such that during commissioning the settings used in the studies can be checked. This may be control revision codes, settings files, or a combination of these and other identification measures.
- L. *Accept external reference variables.* This includes real and reactive power ordered values for Q control modes, or voltage reference values for voltage control modes. Model should accept these reference variables for initialization, and be capable of changing these reference variables mid-simulation, ie. dynamic signal references.
 - M. *Be capable of initializing itself.* Once provided with initial condition variables, the model must initialize and ramp to the ordered output without external input from simulation engineers. Any slower control functions which are included (such as switched shunt controllers or power plant controllers) should also accept initial condition variables if required.
 - N. *Have the ability to scale plant capacity.* The active power capacity of the model should be scalable in some way, either internally or through an external scaling transformer⁴. This is distinct from a dispatchable power order, and is used for modeling different capacities of plant or breaking a lumped equivalent plant into smaller composite models.
 - O. *Have the ability to dispatch its output to values less than nameplate.* This is distinct from scaling a plant from one unit to more than one, and is used for testing plant behaviour at various operating points.
 - P. *Initialize quickly.* Model must reach its ordered initial conditions as quickly as possible (for example <5 seconds) to user supplied terminal conditions.

Study Efficiency Features

In addition, the following elements are required to improve study efficiency, model compatibility, and enable other studies which include the model to be run as efficiently as possible. If these features are not supported, additional discussion is required⁵:

- Q. Model should be compatible with Intel Fortran compiler version 12 and higher.
- R. Model should be compatible with PSCAD version 4.5.3 and higher.
- S. Model supports multiple instances of its own definition in the same simulation case.
- T. Model supports the PSCAD “timed snapshot” feature accessible through project settings.
- U. Model supports the PSCAD “multiple run” feature.
- V. Model does not use or rely upon global variables in the PSCAD environment.
- W. Model should not utilize multiple layers in the PSCAD environment, including ‘disabled’ layers.

⁴ A free publicly available scaling transformer suitable for this purpose is available in the E-Tran library.

⁵ Electrenix has parallelization tools available (E-Tran Plus for PSCAD) which can circumvent compatibility concerns in some cases.

Attachment #1: PSCAD Model Test Checklist

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Purpose

This document is a test checklist meant to accompany “PSCAD Model Requirements Rev. 9” provided above and “Attachment #2: PSCAD Model Requirements Supplier Checklist”. The procedures provided in this document are intended to provide an indication of the core model accuracy, performance, and usability features specified in the model requirements. These procedures cannot ultimately prove that the model is compliant with all requirements, as black box models usually hide the details of the equipment controls and protection. It is recommended that the equipment manufacturer supply additional confirmation that the model meets each individual requirement. The requirements in this document do not necessarily represent interconnection criteria for specific individual systems, and may be supplemented or adjusted based on interconnection region.

The tests outlined here are considered “basic”, and may be supplemented by more rigorous testing, including various fault types, depths, and durations, as well as more extensive protection testing and benchmarking against phasor models. This document is not intended to be a guide for thorough benchmarking between PSCAD, PSS/E, and actual equipment, and is subject to revision as the state of the art in EMT modeling evolves.

<i>Model test Summary</i>	
Model Test date:	
Project Name:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file:	
Model Files supplied:	

Verification Procedure and Checklist

		Pass/Fail	Comments
<i>Vendor and site specific model verification</i>			
1a	The Vendor's name and the specific version of the model should be clearly observable in the .psc model file.		
1b	Documentation and supporting model filenames should not conflict with model version shown in the .psc model file.		
1c	Model is supplied with a test circuit which is configured for the site specific application. ⁶		
<i>"Real Code" model verification</i>			
2a	Controls are black-boxed, and no PSCAD master library control blocks are visible within control circuits. ⁷ If the model is not based on "real code", a separate validation report is required showing model comparison against hardware tests. ⁸		
<i>Model usability verification</i>			
3a	Model uses a timestep greater than 10 μs ⁹		
3b	Model allows a variation in simulation timestep		
3c	Model compiles using Intel FORTRAN version 12		
3d	Model initializes in 5 seconds or less with a POI level SCR of 2.5. Real power, reactive power, and RMS voltage should reach steady state by this time.		
3e	Model allows multiple instances of itself to be run together in the same case ¹⁰		
<i>Model electrical configuration verification</i>			
4a	Plant level electrical single line diagram (SLD) is included.		

⁶ The test circuit should model all relevant electrical components of the plant and contain a system equivalent. Parameters will be assumed to be site-specific, unless there are obvious indications otherwise, such as an incorrect grid base frequency.

⁷ Black-boxing of controls to a high level does not guarantee that real-code is embedded into the model, however the visibility of PSCAD master-library control blocks in the inner control loops (PLL, inner current controllers, etc.) suggest that the model is generic in nature. Model documentation may contain information on use of real-code in the model.

⁸ All aspects of the controller operation are required to be validated by utilizing a "hardware in loop" platform or other hardware test systems. Model should not be validated against other software models. Validations should include control responses to various types of faults, changes in power and voltage references, changes in system frequency, testing frequency response in sub and super-synchronous ranges, and testing of protection operation. Tests should also be performed under a variety of system strengths, including very weak systems. Other tests may also be required. The validation report is required along with any model updates that result from the more rigorous validation tests.

⁹ Models with timesteps less than 10 μs may be acceptable in situations where a small timestep does not significantly increase the runtime of the total simulation

¹⁰ Depending on specific application and whether E-Tran Plus for PSCAD is allowed to be used to overcome the limitation, this requirement may be waived.

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4b	Generator step-up transformer(s) included, with impedance between 5 and 10% on generator base, and matches SLD. ¹¹		
4c	Lumped collector equivalent(s) included, with total charging equal to between 0.5 and 5% of plant rating, and matches SLD. ¹¹		
4d	Substation transformer(s) included, rated appropriately for plant size, and impedance between 6 and 12% on transformer base, and matches SLD. ¹¹		
4e	Model can be scaled to represent any number inverters/turbines, either using a scaling transformer or internal scaling.		
4f	All external devices included in the plant (such as STATCOMs) include appropriate models.		
<i>Plant controller verification</i>			
5a	Model includes power plant controller (PPC)		
5b	PPC accepts an external active power setpoint.		
5c	PPC accepts a voltage setpoint.		
5d	PPC has a mechanism to implement a settable voltage droop.		
5e	Overall plant responds to frequency changes by increasing or decreasing its active power as appropriate. This may be accomplished either at an inverter level or via the PPC. ¹²		
5f	Model initializes to the setpoints specified in the PPC. If droops or deadbands are utilized, the initial values may differ from the setpoints. ¹³		
5g	If external voltage control devices (STATCOM/DVAR, SVC, MSCs) are included in the plant, ensure that the voltage control of these devices is coordinated with the PPC, with no potential for VAR looping or oscillations.		
<i>Basic performance verification¹⁴</i>			
6a	Instantaneous voltage and current waveforms have minimal distortion, and no oscillations are observed.		

¹¹ Impedance range is for sanity checking only. Impedances outside this range may be allowed.

¹² Non-compliance with this item may not require model revision as frequency response may not be required in PSCAD models by some utilities. In this case, a description of the under/over frequency response capabilities of the actual equipment should be provided by the manufacturer.

¹³ If voltage control with droop is implemented, it is preferred that the PPC model requests an initial Q value to match the voltage setpoint. If no initial Q is requested, the voltage setpoint can be biased by the initial Q before it is sent to the PPC. If a non-zero deadband is included in the voltage controller, the deadband can also be considered in the voltage setpoint sent to the PPC.

¹⁴ Performance testing is recommended with a POI level SCR of 2.5 as this is a representative system condition seen during weak system studies. Testing may be performed at higher SCRs if the stable operating SCR of a model is known to be above 2.5.

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6b	Model is able to ride-through and recover from a temporary (no line outage or drop in SCR), 6-cycle, zero-impedance, three-phase fault at the high side of the station transformer, with a POI level SCR of 2.5.		
6c	Model responds to a step change in PPC voltage setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. (Various systems may have specific speed requirements, which should be met)		
6d	Model responds to a step change in PPC active power setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. ¹⁵		
<i>Basic protection verification</i> ¹⁶			
7a	Protection settings are implemented. These could be available as inputs in the model, or hard-coded in the black-boxed controls. ¹⁷		
7b	Option to disable protection models is present. ¹⁸		
7c	Model trips or blocks when terminal voltage rises above 1.3 pu for 1.5 second. ¹⁹		
7d	Model trips or blocks when terminal voltage falls below 0.2 pu for 1.5 second. ¹⁹		
7e	Model clearly displays trip / diagnostic signals indicating the status of all pertinent protection elements		
<i>Documentation</i>			
8a	Model documentation states compliance with "PSCAD Model Requirements Rev. 9 Rev. 9" ²⁰ , or is supplied with a completed PSCAD Model Requirements Supplier Checklist.		
8b	Model documentation includes instructions for setup and running of the model, including the recommended range of simulation timesteps. Documentation should give a clear description of trip / operation code signals produced by model.		

¹⁵ Different response time criteria may apply depending on specific interconnection region.

¹⁶ There are many protection functions which should be modelled, per footnote 1, and these basic tests will not be proof that these are modelled.

¹⁷ If settings are not visible in model or documentation, verification that protection settings are implemented in the PSCAD model should be received from the manufacturer.

¹⁸ Non-compliance may not require model revision as many studies do not require testing with protection settings disabled.

¹⁹ Non-compliance with this item should result in verification of protection settings implementation from the manufacturer, as some models may have capabilities beyond what is listed here.

²⁰ Non-compliance may be waived in systems which do not require compliance with the model requirements document.

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Purpose

This document is a model requirements checklist which should be completed by the supplier of the model and submitted alongside each PSCAD model. This document accompanies the “PSCAD Model Requirements Rev. 9” document above (PMR), which should be used for further reference to describe the requirements associated with each point. Generic testing of the model may be done using “Attachment #1: PSCAD Model Test Checklist”, which may be used as a reference.

Model supplier must review every item in the checklist and indicate compliance for each item. If the supplied model does not meet any of the requirements an explanation of the deficiency should be provided in the comments column.

<i>Model Submission Summary (to be completed by model supplier)</i>	
Submission date:	
Project Name:	
Primary contact information for model related questions:	
Secondary contact information for model related questions:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file(s):	
Model Files supplied:	



Model Requirements Checklist		PMR Reference	Model Complies? (Yes/No)	Comments
1 Model Accuracy Features				
1.1	Power electronic controls are modelled by interfacing with actual firmware code from the inverter (“real code” model), or includes detailed validation report.	A, B		
1.2	Operating modes which require system specific adjustment are accessible.	B		
1.3	Plant level controller is included. ²¹	B		
1.4	Model is capable of controlling frequency ²²	B		
1.5	Includes pertinent electrical and mechanical features, such as gearboxes, pitch controllers, or other features which impact the plant performance in the simulation period. ²³	C		
1.6	All protections which could impact ride-through performance are modelled in detail.	D		
1.7	Model is configured for the specific site being evaluated, as far as they are known.	E		
2 Model and Project Documentation				
2.1	Model includes documentation.	J		
2.2	Documentation includes instruction for setup and running the model.	J		

²¹ If the plant is part of a multi-plant control scheme, a description of the overall scheme should be provided, and corresponding PPC models should be configured to control multiple plants accordingly.

²² Frequency control model requirements may vary by region. Example response time may be less than 10 seconds.

²³ Simulation period may vary depending on the model use, but 10 seconds of simulation following an event such as a fault is a typical period.

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2.3	Model is supplied with a sample test case including site specific plant representation.	J	
2.4	Plant single line diagram is provided, and aligns with model	J	
2.5	Model documentation provides a clear way to identify site-specific settings and equipment configuration.	K	
3	<i>Model Usability Features</i>		
3.01	Control or hardware options are accessible to the user as applicable.	F	
3.02	Diagnostic flags are visible to the user.	F	
3.03	Model uses a timestep greater than 10 μ s.	G	
3.04	Model allows a range of simulation timesteps (ie. not restricted to a single timestep).	H	
3.05	Protection model may be disabled for troubleshooting	I	
3.06	Model accepts external reference variables for active and reactive power and voltage setpoint, and these may be changed dynamically during the simulation.	L	
3.07	Model is capable of initializing itself.	M	
3.08	Active power capacity is scalable.	N	
3.09	Active power is dispatchable.	O	
3.10	Model reaches setpoint P, Q, and V in 5 seconds or less	P	
3.11	Model compatible with Intel FORTRAN version 12 and higher.	Q	
3.12	Model compiles using PSCAD version 4.5.3 or higher.	R	
3.13	Model supports multiple instances of its own definition in a single PSCAD case.	S	
3.14	Model supports PSCAD "snapshot" feature.	T	

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3.15	Model supports the PSCAD “multiple run” feature.	U	
3.16	Model does not use PSCAD global variables.	V	
3.17	Model does not use PSCAD layer functionality	W	

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DETAILED INSTRUCTIONS FOR COMMUNITY OUTREACH PLAN

- The Community Outreach Plan should be as current and explanatory as possible.
 - The Community Outreach Plan information must be included in the information Proposers selected to the Final Award Group make available on their website when the website is posted publicly.
- Proposers selected to the Final Award Group must develop a public Project website, which shall include all the information on the Community Outreach Plan table for their Project.
- Proposers must develop Project presentations that include all the information on the Community Outreach Plan table (sample template provided).
- Due to the uncertainty of the duration of the COVID-19 pandemic, all Proposers are required to plan for both in-person and virtual community meetings. As we near the dates that community meetings are scheduled, in the interest of public health and safety, the conditions at the time will determine if in-person meetings or virtual meetings will be required.
 - Virtual community meetings can either be community televised, or online, but must incorporate technology that allows for live engagement and interaction between the Proposer and community participants.
- Proposers must communicate important information about the Project with stakeholders in advance of community meetings.
- Proposers must perform media outreach (earned media) and advertising (paid media) to raise community awareness of any public meeting. Media advisories (sample attached) must be issued to the following media and organizations a minimum of 30 days prior to a public meeting. Media advisories do not need to be reviewed and approved by Hawaiian Electric, but must be shared with Hawaiian Electric for awareness.
 - For Oahu Projects
 - Star Advertiser
 - Civil Beat
 - Hawaii News Now
 - KHON2 News
 - KITV4 News
 - Neighborhood Boards
 - For Maui Projects
 - Maui News
 - Maui Now
 - Civil Beat
 - Hawaii News Now
 - KHON2 News
 - KITV4 News
 - For Hawaii Island Projects
 - Hawaii Tribune Herald
 - West Hawaii Today
 - Civil Beat
 - Hawaii News Now
 - KHON2 News
 - KITV4 News
- Advertisements must be placed in area community publications.
 - Guidance from the Company can be provided upon request

- Information in the ads must be consistent with the media advisory
- Public comments in support and in opposition to the proposed Project must be compiled and filed verbatim with the Public Utilities Commission.
- Proposers must work with and inform neighboring communities and stakeholders to provide community members timely information during ALL phases of the project, which must include, but not be limited to the Power Purchase Agreement negotiation period, the permitting process periods, and throughout construction.
- Should any COVID-19 related events interfere with the Proposer's ability to perform the listed actions, Proposer should inform the Company immediately of such effects for Company's consideration and guidance, and possible proposal of alternate actions.

CONTACT: **NAME, 808.XXX.XXXX** **FOR IMMEDIATE RELEASE**
Email address Date

Media Advisory: Title

Project description to be drafted by developer. Description must include the location of proposed project and supporting background information.

Date: TBD

Time: TBD

Location: TBD

Purpose: To share information about a **TYPE (e. g. CBRE solar, etc.)** renewable energy project proposed to be developed in **COMMUNITY** near **AREA REFERENCE** and to solicit public comments to be filed with the Public Utilities Commission.

Contact: For more information, call **808.XXX.XXXX** or visit **(website/social media)**

###

Project Name

Proposer Name

Project Benefits

Details

Community Benefits

Details

Proposed Facility Location in/near what City/Area

Map

Dimensions of proposed project

Include all project components

Project Description

Details

Site Layout Plan

Project Layout

Project Visual Simulations

- Multiple public vantage points

Interconnection Route

Map

Required Government Permits and Approvals

Preliminary Schedule

Opportunities for public comment

Environmental Impacts

Preliminary environmental assessment of the site (including any pre-existing environmental conditions)

Cultural Impacts

Identify any cultural, historic or natural resources that will be impacted by the project

Describe the potential impacts on these resources

Identify measures to mitigate such impacts.

Where to Find More Information

Project website

Proposer email and contact information

How to Provide Comments

CBRE Stage 2 Model and Interconnection Requirements Study (IRS) Scope

Island Size	Moloka'i Facility = 250KW Primary Metered & Dedicated Transformer Connecting to 4kV, 12kV	Moloka'i Facility = 250KW Secondary Metered & Dedicated Transformer Connecting to 4kV, 12kV	Moloka'i Facility = 250KW Secondary Metered & Dedicated Transformer Connecting to 4kV, 12kV																																																																		
Models	A PSCAD model will be required for Over-Voltage analysis	A PSCAD model will be required for Over-Voltage analysis	PSS®E Generic, PSS®E User Defined, PSCAD, and ASPEN, Grid Forming PSCAD, and Grid Forming PSS®E																																																																		
System Impact Study Scope	Results of ITR and SR determine if IRS is required and its scope.	Results of ITR and SR determine if IRS is required and its scope.	Results of ITR and SR determine if IRS is required and its scope.																																																																		
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Reference Single Line Diagram (See Appendix H)	Typical Primary Distribution (250KW and larger to less than 1MW) Interconnection Single Line Diagram for CBRE	Typical Secondary Distribution (250KW and larger to less than 1MW) Interconnection Single Line Diagram for CBRE	See Single Line Diagram for each respective site																																																																		

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REQUEST FOR PROPOSALS

FOR

COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

*Appendix C – Code of Conduct Procedures
Manual*

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix C – Code of Conduct Procedures Manual, Exhibit 5 of the March 30, 2021 filing]



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REQUEST FOR PROPOSALS

FOR

COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

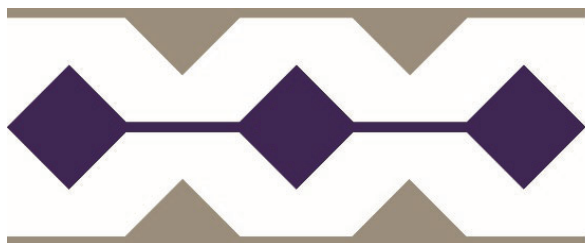
ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

Appendix D – PowerAdvocate User Information

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix D – Code of Conduct Procedures Manual, Exhibit 5 of the March 30, 2021 filing]



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REQUEST FOR PROPOSALS

FOR

COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

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Docket No. 2015-0389

*Appendix E – Mutual Confidentiality and
Non-Disclosure Agreement*

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix E – Mutual Confidentiality and Non-Disclosure Agreement, Exhibit 5 of the March 30, 2021 filing]



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REQUEST FOR PROPOSALS
FOR
COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

Appendix F – Description of Available Sites



**Maui
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**MAUI ELECTRIC
COMMUNITY-BASED RENEWABLE ENERGY RFP
DESCRIPTION OF AVAILABLE SITES**

Land Request for Information

On June 15, 2020, the Hawaiian Electric Companies issued a Land Request for Information (“Land RFI”) seeking information on available land and rooftop space for potentially siting future utility scale renewable energy projects on the islands of O‘ahu, Maui, Moloka‘i, and Hawai‘i. This effort is a completely new solicitation from the previous Land RFI that was issued on December 12, 2016 in advance of the Company’s Stage 1 and Stage 2 RFPs. The information that has been gathered through this RFI is available upon request by following the instructions at <http://hawaiianelectric.com/landrfi>.

This information is being provided for proposers’ consideration only. Project proposals submitted in response to this RFP are not required to be sited at a location identified through the Land RFI. Maui Electric also makes no representations as to the suitability of the listed sites for renewable energy production with regard to resource quality, interconnection constraints, zoning and permitting issues, community support, or other issues. Proposers should perform their own evaluation of these factors in determining whether a site is suitable for renewable energy project development. After further evaluation, proposers that are interested in any of the identified sites are invited to engage in further discussions directly with landowners to negotiate any required rights to use the property.

Company Owned Site – Pala‘au Site

The Company is offering use of the Pala‘au Site for nominal consideration to site a renewable generation and paired energy storage facility. Any Proposer proposing to use the Pala‘au Site shall be required to agree to specific terms and conditions for such use as provided for in the Terms and Conditions for Use (“TCU”), a proposed form of which is attached as Attachment K to the Mid-Tier SFC. Limited sections of the TCU relating to use restrictions, security and infrastructure requirements, compliance with laws, lien restrictions, and end of term obligations shall be non-negotiable.

The site, available to Proposers under this RFP, is approximately 7.2 acres, provided that any Proposer shall only be permitted to use as much acreage as is necessary for its Project. Projects interconnecting at the Pala‘au Generating Station must be 1 MW or larger, up to and including 2.5 MW. The interconnection point would be the Pala‘au Generating Station switchyard. Proposers must include the cost for interconnecting into the switchyard in their Proposals.

The approximately 7.2 acre available land is comprised of 3 separate areas, as identified in Appendix F Attachment 2 and further defined below:

1. Area A is approximately 5.7 acres
 - a. Ground mount photovoltaic and BESS is acceptable
 - b. Proposers must provide clearances around existing power lines as directed by the Company, per the applicable requirements 4.b-4.h described below
 - c. Proposer must avoid any underground utilities, as identified and directed by the Company. There may be an existing underground water line crossing the area, pending confirmation of the as-built drawings and/or ground penetrating scans.
 - d. Proposers must build around or relocate the existing telecommunications pole noted on Appendix F Attachment 2. Lease agreement of Company Site may require co-location with Company fiber.
 - e. Proposer must avoid all capped wells. There is at least one well located near the water tank in the northeast corner, pending final confirmation.
 - f. Proposer can develop the existing paved area and utilize the gate at the northeast end for site access, if desired. Proposers should provide their own site access from the road.
2. Area B is approximately 1 acre and contains the visitor parking lot
 - a. Ground mount photovoltaic and BESS is acceptable
 - b. If proposer utilizes this site, the visitor parking lot must be relocated to area 'C'.
 - c. The existing security gate to access secured area of plant must be moved to the South, and employee parking lot 'C' must be converted to a combination of open lot for public access and a fenced employee lot, as directed by the Company.
 - d. Number of public and employee stalls and vegetation requirements to be determined by the Company
3. Area C is approximately 0.5 acre
 - a. If this area is utilized, only a covered parking PV canopy is acceptable
 - b. Reference the additional applicable requirements 2.c & 2.d
4. General Requirements
 - a. All utilized areas require fencing and separation from the power plant. Fencing and security will require Company review and approval.
 - b. Vehicular access (for the Company's bucket/boom trucks) and working clearances should be provided to all existing overhead Company facilities to allow for safe and efficient maintenance and replacement of those facilities.
 - c. PV panels may not be installed under existing lines for safety and operational reasons.
 - d. NESC 2002 clearances are required at a minimum, but those clearances may need to be larger to account for working clearances.
 - e. On one side of the 12kV line, provide at least 25ft horizontal working clearance to the nearest energized facility (typically the edge of the crossarm or outside conductor). This clearance space shall extend at least 40ft past any dead-end pole. This space is for the Company's large vehicles to set up and operate to perform work on the lines.

- f. On the other side of the 12kV line, provide at least 10ft horizontal working clearance to the nearest energized facility. This clearance shall extend at least 10ft past any dead-end pole.
- g. Guy wires should have at least 2.5ft clearance on each side of the guy and should extend at least 3ft past the anchor.
- h. Please note that the clearances provided above are typical clearances and do not account for site-specific details. They are to be used for planning purposes only and are subject to change depending on the specific circumstances once the Company reviews any proposed layout. The larger clearance between the NESC required clearances and the working clearances described above shall be used.

Upfront costs to the Proposer associated with the use of the Pala‘au Site include the following: (1) baseline assessments of the Pala‘au Site, either a Phase 1 or Phase 2 environmental assessment and, as necessary, archaeological study; and (2) applicable physical and data security requirements. Ongoing costs are customary and will be reserved in the TCU (insurance costs, security costs, etc.) or the Mid-Tier SFC, as applicable. See Attachment K of the Mid-Tier SFC for details on these upfront and ongoing use costs.

The specified costs above are not exhaustive, and the Proposer is encouraged to review the TCU to determine all associated use costs. Proposers should perform their own evaluation and account for all possible costs and should not rely solely on the identified costs noted above. Proposer also shall be responsible, at its sole cost and expense, for all site improvements, utilities, permits, and other required infrastructure and regulatory requirements that are necessary for use of the Pala‘au Site for Proposer’s Project.

Projects at the Pala‘au Site must interconnect at the existing Company switchgear. Work within the switchyard may include, but is not limited to, the installation of one (1) new 12 kV vacuum circuit breaker for each interconnecting line within an existing Company switchgear, new relaying and control equipment for the 12 kV vacuum circuit breaker within the Company’s switchgear enclosure building, transitioning the new 12 kV overhead interconnection to underground within the switchyard, and underground 12 kV duct lines and cable trenching within the switchyard to an existing handhole. A grounding study may be needed to determine if the existing ground grid is sufficient. The IRS will confirm all necessary interconnection facilities.

Due to COVID 19 travel restrictions, a site visit will not be considered at this time. The Company will endeavor to provide as much information as possible to interested potential Proposers. Additional site information, beyond the details included in Appendix F, may be provided by the Company. Information on how to request additional information, if available, will be posted on the Company’s website.

Any drawings, reports, or any other information or data relating to the Site (“Site Information”) is being furnished for the Proposer’s convenience only and the Company assumes no responsibility whatsoever in respect to the sufficiency or accuracy of such Site Information or of the interpretation thereof, and there is no guarantee, either expressed or implied, that the conditions indicated are representative of those existing throughout the Site. In addition, no assurance is given that conditions found at the time of any surface or subsurface explorations will be the conditions that prevail at the time of construction at the Site. The Proposer shall be solely responsible for all assumptions, deductions, or conclusions the Proposer may make or derive from the information furnished. Making such information available to the Proposer is not to be construed in any way as a waiver of the Proposer’s responsibility to examine the Request for Proposals and the Site. Proposers must satisfy itself through its own investigation as to conditions to be encountered at the Site.

Additional Information

Additionally, the following links to a few publicly available resources relating to renewable energy project siting and development from the Hawaii State Energy Office are being provided for use at proposers’ sole discretion:

Project Permitting Assistance and Resources

<http://energy.hawaii.gov/developer-investor/project-permitting-assistance-and-resources>

Provides numerous resources to support more informed and appropriate project siting and permitting, including the Permit Guide, Renewable Energy Permitting Consultants, DOH, ePermitting Portal, Renewable EnerGIS, Permitting Wizard, and the Renewable Energy Projects Directory.

Hawaii Clean Energy Programmatic Environmental Impact Statement

<http://energy.hawaii.gov/testbeds-initiatives/hawaii-clean-energy-peis/peis-overview>

The Hawaii Clean Energy Programmatic Environmental Impact Statement (PEIS) analyzes, at a programmatic level, the potential environmental impacts of clean energy activities and technologies in the following clean energy categories: (1) Energy Efficiency, (2) Distributed Renewables, (3) Utility-Scale Renewables, (4) Alternative Transportation Fuels and Modes, and (5) Electrical Transmission and Distribution.

Hawaii Statewide GIS Program

<http://planning.hawaii.gov/gis/>

Provides Hawaii GIS data and other resources to support site identification and analysis.

**Aloha Aina: A Framework for Biocultural Resource Management in Hawai‘i’s
Anthropogenic Ecosystems**

https://nmshawaiihumpbackwhale.blob.core.windows.net/hawaiihumpbackwhale-prod/media/archive/council/pdfs/aloha_aina.pdf

A framework developed by the Hawaiian Islands Humpback Whale National Marine Sanctuary Advisory Council to integrate Native Hawaiian and Western scientific management approaches toward ecosystem management. While intended for the Sanctuary, this document provides useful insight into successful collaboration in Hawaii.



MOLOKA'I

PALA'AU

Google Earth

Data MBARI
Data USGS
Data SOEST/UHM

21°15'37.82" N 157°07'17.41" W elev -1473 ft eye alt 38.66 mi



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REQUEST FOR PROPOSALS

FOR

COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

*Appendix G – Self-Build Option and
Self-Build Option Team Certification Form*

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix G – Self-Build Option and Self-Build Option Team Certification Form, Exhibit 6 of the March 30, 2021 filing]



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FOR
COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

*Appendix H – Interconnection Facilities Cost
and Schedule Information*



**Hawaiian
Electric**

Hawaiian Electric Company
APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
INFORMATION

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APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
INFORMATION

Tariff Rule No. 19, approved by the PUC, establishes provisions for Interconnection and Transmission Upgrades (<https://www.hawaiianelectric.com/billing-and-payment/rates-and-regulations/>). The tariff provisions are intended to simplify the rules regarding who pays for, installs, owns, and operates interconnection facilities in the context of competitive bidding. Tariff Rule No. 19 will be utilized as the basis for addressing interconnection and transmission upgrades for any projects developed through this RFP. Proposers will comply with the terms and conditions as specified therein.

SECTION 1 – COST RESPONSIBILITIES

The purpose of Section 1 is to clearly define the cost responsibilities of construction, replacements, and upgrades of Company-Owned Interconnection Facilities (COIF) and existing Company-owned facilities in compliance with Tariff Rule No. 19.

1.1 – DEFINITIONS

1. Betterment – Any upgrading to a facility made solely for the benefit of and at the election of the Company and is not required by applicable laws, codes, Company Standards, and the interconnection requirements in accordance with Tariff Rule No. 19.
2. Company – Hawaiian Electric, Maui Electric, or Hawai‘i Electric Light.
3. Grid Connection Point – The point that the new interconnection facilities associated with the Proposer’s project interconnects to the Company’s existing electrical grid.
4. Interconnection Agreement – The executed contract between the Company and Proposer (e.g. Power Purchase Agreement, Standard Interconnection Agreement, etc.).
5. Point of Interconnection – The point of delivery of energy supplied by Proposer to Company, where the Facility owned by the Proposer interconnects with the facilities owned or to be owned by the Company.
6. Proposer – The developer proposing a renewable project in response to a Company RFP.

1.2 – ABBREVIATIONS

1. ADSS – All Dielectric Self-Supporting
2. COIF – Company-Owned Interconnection Facilities
3. CT – Current Transformer
4. DFR – Digital Fault Recorder
5. DTT – Direct Transfer Trip
6. FS – Facility Study
7. GCP – Grid Connection Point
8. HVAC – Heating, Ventilation, and Air Conditioning

Hawaiian Electric Company
APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
INFORMATION

9. IRS – Interconnection Requirements Study (includes both SIS and FS)
10. OPGW- Optical Ground Wire
11. POI – Point of Interconnection
12. PT – Potential Transformer
13. RTU – Remote Terminal Unit
14. SCADA – Supervisory Control and Data Acquisition
15. SIS – System Impact Study
16. UFLS – Under-Frequency Load Shed

1.3 – FACILITIES AT PROPOSER SITE

1. Proposer shall be responsible for all costs related to COIF at the Proposer site required by any relevant Rule or Tariff, Request for Proposal, and/or the IRS. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Site work (grading, trenching, manholes/handholes, conduits, cable trench, concrete pads/foundations, fencing, roadways/driveways, ground grid, lighting, etc.)
 - c. Substation structures, design, and configuration (i.e., breaker and a half, ring bus, etc.)
 - d. Control equipment enclosure/cabinet
 - e. Equipment (circuit breakers, transformers, relays, switches, arresters, batteries, HVAC, RTU, DFR, DTT, meters, PTs, CTs, etc.)
 - f. Telecommunication equipment (See Telecommunication Facilities section below)
 - g. Electrical work (bussing, wiring, lightning protection, fiber optic cable, etc.)
 - h. Security systems/equipment
2. Company shall be responsible for Betterment costs.

1.4 – STATION POWER FOR COMPANY SWITCHING STATION

1. Station power is required if a new Company switching station or substation is built to allow the interconnection of the Proposer's project. If station power is required, the Proposer shall be responsible for all costs related to the primary and backup station power sources. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Overhead electrical facilities (poles, conductor, insulators, crossarms, guy wires, transformers, etc.)
 - c. Underground electrical facilities (cables, splices, termination, grounding, transformers, switchgears, etc.)
 - d. Step-down transformer

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- e. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - f. Vegetation trimming and traffic control
2. Options for primary station power sources for the Company's various switching station voltages are:
- a. Tap off the bus through a step-down transformer for 23kV through 69kV
 - b. 12kV line extension and service transformer for 23kV through 138kV
 - c. Gensets are not an allowable substitute for the above options

1.5 – REMOTE SUBSTATION FACILITIES

1. Proposer shall be responsible for all costs that are solely for the benefit of the Proposer's project, that cannot be used for future system benefit, and that does not provide any benefit to other customers. This may include, but is not limited to:
- a. Telecommunications cards for DTT (if required)
 - b. Point-to-point microwave facilities between the Proposer's facility and the remote substation (if Proposer chooses that communications option) since there is no way to splice into or multi-link a microwave and it cannot be used for other purposes
2. If the project is interconnecting directly to an existing Company substation, any new equipment required at the substation to accommodate the interconnection will be considered Interconnection Facilities according to Tariff Rule No. 19 and all costs shall be the responsibility of the Proposer. This may include, but is not limited to:
- a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Site work (grading, trenching, manholes/handholes, conduits, cable trench, concrete pads/foundations, fencing, roadways/driveways, ground grid, lighting, etc.)
 - c. Substation structures
 - d. New control equipment cabinet or existing enclosure expansion
 - e. Equipment (circuit breakers, transformers, relays, switches, arresters, batteries, HVAC, DFR, DTT, meters, PTs, CTs, etc.)
 - f. Electrical work (bussing, wiring, lightning protection, fiber optic cable, etc.)
3. Company shall be responsible for all other costs. This may include, but is not limited to:
- a. Betterment
 - b. System upgrades, changes, or replacement of existing facilities (e.g. breaker replacements, relay upgrade, transformer installs, Under-Frequency Load Shed (UFLS) settings, etc.)
 - c. Site work associated with those system upgrades (grading, trenching, manholes/handholes, conduits, cable trench, concrete pads/foundations, fencing, roadways/driveways, ground grid, lighting, etc.)
 - d. Substation structures
 - e. New control equipment cabinet or existing enclosure expansion

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- f. Equipment (circuit breakers, transformers, relays, switches, arresters, batteries, HVAC, DFR, DTT, meters, PTs, CTs, SCADA equipment, telecommunications routers, etc.)
- g. Electrical work (bussing, wiring, lightning protection, fiber optic cable, etc.)

1.6 – LINE EXTENSION FROM GRID CONNECTION POINT (GCP) TO PROPOSER SITE

1. Proposer shall be responsible for all costs related to the line extension between the GCP and the Proposer site. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Overhead electrical facilities (poles, conductor, insulators, crossarms, guy wires, etc.)
 - c. Underground electrical facilities (cables, splices, terminations, grounding, transformers, switchgears, etc.)
 - d. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - e. Company fiber (ADSS fiber, OPGW shieldwire, splice boxes, etc.)
 - f. Vegetation trimming and traffic control
2. The Company shall be responsible for the following costs:
 - a. Betterment
 - b. Replacement of overhead and underground facilities due to certain pre-existing conditions and not caused by interconnection of the Proposer's project as follows:
 - i. Asset is identified for replacement in Company's 5-year work plans
 - ii. Poles (if not identified in 5-year work plans) that require replacement based on the Company's standards and practices (e.g. NESC remaining strength requirements, mechanical or insect damage, cracked, and excessive checking, leaning, or corrosion) or poles that are overloaded prior to addition of the new line
 - iii. Conductors, hardware, and equipment that have issues requiring replacement for safe/reliable operation (e.g. corrosion, damage, etc.)
 - iv. Facilities that meet any of these criteria will be identified by Company engineers
 - v. Company will pay for a one for one equivalent to current standards, and Proposer will pay for anything above that standard required for their interconnection

1.7 – T&D SYSTEM UPGRADES

1. Company shall be responsible for all costs related to system upgrades or changes required to accommodate the Proposer's project (e.g. reconductoring or recircuiting)

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of existing lines that do not have the required ampacity, re-fusing or re-programming of protective devices upstream of the GCP, etc.)

1.8 – COMPANY-OWNED FIBER

1. If Company-owned fiber is used to satisfy the communications requirements in the IRS, then the Proposer shall be responsible for all costs related to routing the ADSS fiber or OPGW from the nearest existing splice point to the Proposer site. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Company fiber-optic cable (ADSS fiber cable or OPGW shieldwire) and associated equipment/hardware (splice boxes, innerduct, vibration dampers, etc.)
 - c. Splicing and Testing of fiber strands
 - d. Pole replacements and additional equipment if needed for additional capacity
 - e. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - f. Vegetation trimming and traffic control
2. Company shall be responsible for Betterment costs

1.9 – TELECOMMUNICATION FACILITIES

1. Telecommunication Cabinet
 - a. If a control equipment enclosure will not be built, the Proposer shall be responsible for all costs related to installing a telecommunication cabinet required to accommodate the telecommunication equipment at the Proposer's facility. This may include, but is not limited to equipment racks and ancillary infrastructure, 48V DC Power System (includes 48V DC Charger w/ at least 12-hr battery backup), alarming, and air conditioning
2. Telecommunication Power
 - a. Proposer shall be responsible for all costs related to providing reliable 48V DC power to Company equipment at a new Company switching station or a Proposer-owned station. This may include, but is not limited to battery racks, banks, fuse panels, and associated power system equipment.
3. Fiber Termination Equipment
 - a. If Company-owned fiber is used to satisfy the communication requirements in the IRS, then the Proposer shall be responsible for all costs related to terminating the ADSS fiber or OPGW at the new Company switching station and point of interconnection to Company's existing system. This may include, but is not limited to a fiber termination panel and associated equipment/hardware (fiber guide, splice trays, connectors, etc.)
4. Microwave Radio or Wireless Radio

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- a. If Company-owned microwave radio (6GHz, 10/11 GHz, etc.) or Company-owned wireless radio (900MHz, 450MHz, etc.) is used to satisfy the communications requirements in the IRS, then the Proposer shall be responsible for all costs related to installing the microwave radio/link at the new Company switching station and remote site(s). This may include, but is not limited to:
 - i. Pre-design requirements (path survey/engineering, FCC frequency coordination, licensing, filings, EME study if required, etc.)
 - ii. Project management, design, permitting, regulatory fees and approvals, land rights, labor, inspection, construction management, and testing
 - iii. Pole or tower facilities to support the microwave dish and its connection to the microwave equipment (waveguide, cables, conduit, etc.)
 - iv. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - v. Antenna system design and installation
5. Leased Service
 - a. If 3rd party leased service will provide telecommunication connectivity to the new Company switching station, then the Proposer shall be responsible for all costs related to ordering and installing the leased service at the site. This may include, but not be limited to the initial cost to establish the leased line(s) required for the project, monthly recurring leased cost of the service(s), and on-going maintenance of the service(s).
6. Telecommunication Service Equipment
 - a. Telecommunication equipment is required to provide circuits to support the various applications at the new Company switching station. The Proposer shall be responsible for all costs related to installing the telecommunication equipment. This may include, but is not limited to:
 - i. Project management, design, installation, and testing
 - ii. Telecommunication routers, multiplexors, and associated equipment/hardware

1.10 – PROPOSER PAYMENTS

1. The Company shall require upfront payment prior to the commencement of any phase of work based on an estimate of Company costs for that phase. A true-up at the end of the project shall be completed and a refund or bill shall be processed in accordance with the Interconnection Agreement when necessary.
2. Proposer is also responsible for payments to the Company related to service contracts for service power.

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SECTION 2 – INTERCONNECTION COSTS

To assist Proposers in assessing the impacts of location on potential projects, the information provided in Section 2 can be used to approximate the cost for Company-Owned Interconnection Facilities (COIF), including substation, telecommunications, security, transmission or distribution lines, and project management. This information is based on typical interconnections as shown in Attachments 1 through 3 of this Appendix H. Conceptual design is not intended to cover all interconnection requirements. Final interconnection design will be subject to the results of a technical review. The per-unit cost figures below should not be used to create a detailed project estimate. A detailed project estimate typically requires a certain level of engineering to assess project site conditions and to factor in other parameters specific to the project.

The Proposer should identify the components assumed for their project and the quantity assumed for each. Each table below provides notes on the assumptions for each of the unit cost estimates. If a Proposer’s project requirements are different than what is assumed in the notes, the Proposer should identify each difference and provide an estimated additional cost or savings resulting from those different requirements. Please see Attachment 4 for examples of how to apply the per-unit costs provided. All costs provided do not include costs related to Proposer responsibilities including, but not limited to, permitting, land rights, community outreach, biological and/or cultural (archeological) surveys. Proposers should do their own due diligence for these costs.

2.1 – DISTRIBUTION (12KV AND BELOW) INTERCONNECTION

Please refer to Attachment 1 (Distribution Secondary Interconnection for 250 kW and larger to less than 1 MW), Attachment 2 (Distribution Primary Interconnection for 250 kW and larger to less than 1 MW), or Attachment 3 (Pala’au Interconnection for Projects 1 MW or larger) of this Appendix H for single line diagrams depicting the required interconnection to the Company’s system. Please see Attachment 4 for examples of how to apply the per-unit costs provided. All costs provided in Section 2.1 assume the COIF will be built by the Company.

A. TYPICAL DISTRIBUTION SECONDARY INTERCONNECTION FOR 250 KW PROJECTS (ATTACHMENT 1)

TYPICAL DISTRIBUTION SECONDARY INTERCONNECTION FOR 250 KW PROJECTS (<u>ATTACHMENT 1</u>)		
Item	Description	Cost
Substation & Meter Baseline Costs		
1	All components shown in <u>Attachment 1</u> except for the T&D Baseline and Distribution line extension costs. <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction, and testing. • Distribution line extension – See Items 2, 3, and 4 and Section 2.1D. 	\$468,000

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TYPICAL DISTRIBUTION SECONDARY INTERCONNECTION FOR 250 KW PROJECTS (ATTACHMENT 1)		
Item	Description	Cost
	<ul style="list-style-type: none"> • Telecommunications requirements – See Section 2.1E. • Security requirements – See Section 2.1F. 	
<p><u>Notes:</u></p> <p>a) Assumes construction in 2022.</p> <p>b) Civil infrastructure and space for COIF provided by Proposer.</p> <p>c) Substation relay protection requirements have not been identified so costs are based upon typical line protection relaying requirements.</p> <p>d) Does not include costs for permitting, land rights, or a Relay Coordination Study.</p>		
T&D Baseline Costs		
2	Tap to OH (secondary interconnection) <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for 3ph riser fuses (100A max) or disconnects, 1 wood pole, 100ft UG line extension (1 feeder), padmount transformer, and 3ph, 4W 600V cables from transformer to Proposer switchgear 	\$225,000
3	Tap to UG Main (secondary interconnection) <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for UG tap, 100ft UG line extension (1 feeder), padmount switch (fuse 100A max), padmount transformer, cable between switch and transformer, and 3ph, 4W 600V cables from transformer to Proposer switchgear • Assumes padmount switch is within 10ft of the Company-owned transformer 	\$278,000
4	Tap to UG Fused Feeder (secondary interconnection) <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for UG tap, 100ft UG line extension (1 feeder), padmount transformer, and 3ph, 4W 600V cables from transformer to Proposer switchgear 	\$206,000
<p><u>Notes:</u></p> <p>a) Assumes construction in 2022.</p> <p>b) Interconnection will typically require either Item 2, 3, or 4 depending on the existing facilities in the area and the specific route of the line extension.</p> <p>c) Includes 100ft UG line extension of one feeder (minimum requirement).</p> <p>d) Proposer can request an additional backup feeder for quicker restoration if a fault occurs. Proposer should add costs for the additional feeder per Item 34.</p> <p>e) OH Line extension – Add applicable costs per Items 30 and/or 32.</p> <p>f) UG Line extension (above 100ft) – Add costs per Item 33.</p> <p>g) Additional OH/UG transitions – Add costs per Item 35.</p> <p>h) Secondary voltage from Proposer is assumed to be 480Y/277V in these scenarios.</p>		

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TYPICAL DISTRIBUTION SECONDARY INTERCONNECTION FOR 250 KW PROJECTS (ATTACHMENT 1)		
Item	Description	Cost
	<ul style="list-style-type: none"> i) Maximum of 11 secondary connections is allowed on the Company-owned transformer. j) Assumes Proposer switchgear is within 10ft of the Company-owned transformer. k) 2-4” conduits required for the UG line extension. l) OH/UG route and civil infrastructure drawings provided by Proposer. m) Civil infrastructure (pads, MH/HHs, conduits, etc.) is designed, procured, and installed by Proposer. n) Includes review of Proposer civil infrastructure designs and materials o) Does not include vegetation clearing, grading, dewatering, permitting or land rights. 	

B. TYPICAL DISTRIBUTION PRIMARY INTERCONNECTION FOR 250 KW PROJECTS (ATTACHMENT 2)

TYPICAL DISTRIBUTION PRIMARY INTERCONNECTION FOR 250 KW PROJECTS (ATTACHMENT 2)		
Item	Description	Cost
Substation & Meter Baseline Costs		
10	Components on the Company side of the demarcation as shown in <u>Attachment 2</u> <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction, and testing. • Distribution line extension – See Items 11, 12, and 13 and Section 2.1D. • Telecommunications requirements – See Section 2.1E. • Security requirements – See Section 2.1F. 	\$468,000
<u>Notes:</u>		
<ul style="list-style-type: none"> a) Assumes construction in 2022. b) Civil infrastructure and space for COIF provided by Proposer. c) Substation relay protection requirements have not been identified so costs are based upon typical line protection relaying requirements. d) Does not include costs for permitting, land rights, or a Relay Coordination Study. 		
T&D Baseline Costs		
11	Tap to OH (primary interconnection) <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for 3ph riser fuses (100A max) or disconnects, 1 wood pole, 100ft UG line extension (1 feeder), and primary termination to Proposer switchgear 	\$114,000

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TYPICAL DISTRIBUTION PRIMARY INTERCONNECTION FOR 250 KW PROJECTS (ATTACHMENT 2)		
Item	Description	Cost
12	Tap to UG Main (primary interconnection) <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for UG tap, 100ft UG line extension (1 feeder), padmount switch (fuse 100A max), and primary cables and terminations between switch and Proposer switchgear • Assumes padmount switch is within 10ft of the Proposer switchgear 	\$162,000
13	Tap to UG Fused Feeder (primary interconnection) <ul style="list-style-type: none"> • If Project < 100A – Includes costs for engineering, materials, construction for UG tap, 100ft UG line extension (1 feeder), and primary termination to Proposer switchgear • If Project ≥ 100A – Not allowed 	\$87,000
<u>Notes:</u> <ol style="list-style-type: none"> a) Assumes construction in 2022. b) Interconnection will typically require either Item 11, 12, or 13 depending on the existing facilities in the area and the specific route of the line extension. c) Assumes Proposer switchgear is within 100ft of the GCP. d) Includes 100ft UG line extension of one feeder (minimum requirement). e) Proposer can request an additional backup feeder for quicker restoration if a fault occurs. Proposer should add costs for the additional feeder per Item 34. f) OH Line extension – Add applicable costs per Items 30, and/or 32. g) UG Line extension (above 100ft) – Add costs per Item 33. h) Additional OH/UG transitions – Add costs per Item 35. i) 2-4” conduits required for the UG line extension. j) OH/UG route and civil infrastructure drawings provided by Proposer. k) Civil infrastructure (pads, MH/HHs, conduits, etc.) designed, procured, and installed by Proposer. l) Includes review of Proposer civil infrastructure designs and materials purchased and inspection of Proposer civil infrastructure construction. m) Does not include vegetation clearing, grading, dewatering, permitting or land rights. 		

C. TYPICAL DISTRIBUTION PRIMARY INTERCONNECTION AT PALA‘AU FOR PROJECTS ≥ 1 MW (ATTACHMENT 3)

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INTERCONNECTION AT PALA‘AU FOR PROJECTS ≥ 1 MW AND ≤ 2.5 MW (ATTACHMENT 3)		
Item	Description	Cost
Substation & Meter Baseline Costs		
21	Components at the Project Site on the Company side of the demarcation as shown in <u>Attachment 3</u> <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction, and testing. • Assumes civil infrastructure and space for COIF is provided by Proposer. • Distribution line extension – See Items 24 and 26 and Section 2.1D. • Telecommunications requirements – See Section 2.1E. • Security requirements – See Section 2.1F. 	\$486,000 / interconnection line
22	Company work for components at Pala‘au PP as shown in <u>Attachment 3</u> <ul style="list-style-type: none"> • Includes engineering, materials, construction, and testing. • Local SCADA equipment is included. • Does not include excavation and fill 	\$600,000 / interconnection line
Notes: <ol style="list-style-type: none"> a) Assumes construction in 2022. b) Substation relay protection requirements have not been identified so costs are based upon typical line protection relaying requirements. c) Does not include costs for permitting, land rights, or a Relay Coordination Study. 		
T&D Baseline Costs		
24	UG Termination to OH Extension <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for UG termination at Proposer site, 100ft UG line extension (1 feeder), 3ph riser with disconnects, and 1 wood pole • Add OH line extension – See Item 30 or 32. • If Proposer’s Facility is segmented, then add additional UG line extension and riser – See Items 33, 34, and 35. Two (2) feeders from the Proposer’s Facility can riser to a single overhead line. • Risers and UG line extension should also be added for termination at Pala‘au PP. 	\$114,000
26	UG Termination to UG Extension <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction for UG termination at Proposer site and 100ft UG line extension (1 feeder) • Add UG line extension (above 100ft) – See Item 33. 	\$87,000

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INTERCONNECTION AT PALA‘AU FOR PROJECTS ≥ 1 MW AND ≤ 2.5 MW (ATTACHMENT 3)		
Item	Description	Cost
	<ul style="list-style-type: none"> If Proposer’s Facility is segmented, then add an additional feeder for the entire UG length – See Item 34. Feeders can be run in the same conduit and MH system. 	
Notes: <ol style="list-style-type: none"> Assumes construction in 2022. Interconnection will typically require either Item 24 or 26 for work at the Proposer’s site in addition to any line extension above 100ft of UG. Includes 100ft UG line extension of one feeder. 2-4” conduits required for the UG line extension. OH/UG route and civil infrastructure drawings provided by Proposer. Civil infrastructure (pads, MH/HHs, conduits, etc.) designed, procured, and installed by Proposer. Includes review of Proposer civil infrastructure designs and materials purchased and inspection of Proposer civil infrastructure construction. Does not include vegetation clearing, grading, dewatering, permitting or land rights. 		

D. DISTRIBUTION LINE EXTENSION COSTS

DISTRIBUTION LINE EXTENSION COSTS		
Item	Description	Cost
30	12kV OH accessible (200ft spans, #1/0 AAC)	\$773,000 / mile
32	12kV OH inaccessible (250ft spans, #1/0 AAC)	\$1,676,000 / mile
33	12kV UG (200ft spans, #4/0 AL PEICN)	\$804,000 / mile
34	12kV UG add’l feeder (200ft spans, #4/0 AL PEICN)	\$482,000 / mile
35	12kV 3ph riser w/ disconnects (including pole/anchor)	\$45,000 each
Notes: <ol style="list-style-type: none"> Assumes construction in 2022. OH assumes wood poles and 3ph overhead conductor with neutral underbuild. Accessible assumes vehicles can be used during construction. Inaccessible assumes helicopters are needed during construction. Includes engineering, materials, construction labor for electrical work, inspection for UG civil infrastructure, and contractor costs for pole/anchor digging. OH/UG route and civil infrastructure drawings provided by Proposer. Civil infrastructure (pads, MH/HHs, conduits, etc.) designed, procured, and installed by Proposer. Does not include vegetation clearing, grading, dewatering, permitting or land rights. 		

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E. TYPICAL TELECOMMUNICATIONS REQUIREMENTS FOR DISTRIBUTION INTERCONNECTIONS

1. 250 KW Projects – See Section 2.4 for costs
 - a. Primary communications links can consist of cellular, lease line, licensed radio, fiber, or microwave.
 - b. Back-up communications links not required.
 - c. Additional analog leased telephone lines are required to support revenue meters (Proposer shall do their own due diligence for costs on this).
2. Interconnection Project at Pala‘au – See Section 2.4 for costs
 - a. Primary communications links can consist of lease line, licensed radio, fiber or microwave.
 - b. Back-up communications links are required (can consist of lease line, licensed radio, fiber, or microwave).
 - c. Back-up communications links must be transport diverse until the “last mile”.
 - d. Additional analog leased telephone lines are required to support revenue meters (Proposer shall do their own due diligence for costs on this).
3. Requirements are subject to change based on project specific evaluations, technical reviews, or IRS.

F. SECURITY REQUIREMENTS FOR DISTRIBUTION INTERCONNECTIONS

1. For Company-owned equipment within Proposer’s Facility, Company requires:
 - a. Standard 8ft high security fence with 3-strand barbed wire V-top.
 - b. Interior mounted 4’ high cattle fencing.
 - c. All gates will be secured using a proprietary padlock system.
 - d. Proposer-owned cabinets/enclosures housing Company equipment shall be secured with a lock provided by Company.
 - e. Company requires 24/7 access to Company facilities within the Proposer facility.
2. See Section 2.5 for more information on Security Requirements.

2.2 – [NOT USED]

2.3 – [NOT USED]

2.4 – TELECOMMUNICATIONS

Please refer to Attachment 1 (Distribution Secondary Interconnection for 250 kW and larger to less than 1 MW), Attachment 2 (Distribution Primary Interconnection for 250 kW and larger to less than 1 MW), or Attachment 3 (Pala‘au Interconnection for Projects 1 MW or larger) of this Appendix H for single line diagrams depicting the required interconnection to the Company’s system. Please see Attachment 4 for examples of how to apply the per-unit costs provided.

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The communications equipment will require a communications channel(s). Some of the communications channel options include cellular, lease line, licensed radio, fiber, or microwave. The number of communication circuits (primary/backup) and type of communication circuits required will vary depending on the type/size of the project.

A. TELECOMMUNICATIONS BASELINE COSTS

The costs below are high level per unit costs for communications requirements in support of the Project. Sections 2.1E and 2.2B above provide typical scenarios of when these options may be utilized.

TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
Communications Cabinet or Enclosure		
70	Communications Enclosure with circuits to support SCADA <ul style="list-style-type: none"> • Only applicable to Cellular, Lease Line, Company-owned fiber options 	\$52,000 / site
72	Communications Cabinet with circuits to support SCADA <ul style="list-style-type: none"> • Projects with SCADA and diverse communication circuits 	\$230,000 / site
<u>Notes:</u> <ol style="list-style-type: none"> a) Assumes construction in 2022. b) All projects that require communications will require facilities to store the communications equipment. The example above is provided but other alternatives may be available upon request. c) Cabinet is used to support Company equipment and capable of providing communications circuit for SCADA. d) Communications cabinet cost does not include fiber, microwave, radio equipment or lease circuits. e) Proposer will provide all conduits, foundations, HHs, AC power, grounding as required per Company standards. 		
Cellular or Lease Line Options		
73	Cellular or Lease Line one-time and recurring costs	Will vary based on 3 rd party provider
<u>Notes:</u> <ol style="list-style-type: none"> a) Add cost of Communications Cabinet – See Items 70-72. b) Check with Company to understand the current cellular or lease line requirements. c) Communication circuit requirements will be based on applications needed for the project. d) Company can provide communication circuit interconnection requirements and assist with review of circuit order from the 3rd party provider as needed. 		

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TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
	<ul style="list-style-type: none"> e) Proposer to work directly with 3rd party provider if a cellular or lease line circuit is needed. f) Cost will be the responsibility of the Proposer and is to be negotiated with the 3rd party provider. 	
Licensed 900 MHz Radio Option		
74	Licensed 900 MHz Radio Equipment <ul style="list-style-type: none"> • Includes 2 each antenna equipment to create a radio link 	\$168,000 / link
<u>Notes:</u> <ul style="list-style-type: none"> a) Assumes construction in 2022. b) Add cost of Communications Cabinet – See Items 71-72. The radio equipment will be installed within the Communication Cabinet. c) Assumes there is radio line-of-sight clearance between the communication endpoints. d) Assumes FCC licensed 900MHz Frequencies are available. e) Assumes there is an existing structure/building with space available on the Company side to mount the antenna equipment and house the radio equipment. f) Assumes Telecommunications grounding standards are up to date at both sites. g) Assumes 48 V DC power with 12-hour battery backup is available. h) Does not include special site-specific permit/approval activities that may be required including, but not limited to, Neighborhood Board(s), Conservation District Use Application, Environmental Assessment, Shoreline Management Area approval, biological (endangered species or habitat) surveys, and/or cultural (archeological) surveys or the cost of any migration required for approvals to be granted. Proposers should conduct their own due diligence for these costs. i) Proposer is responsible to install a structure to mount the antenna equipment on the Proposer side and provide any conduit required between the Communications Cabinet and the antenna mount structure. 		
Fiber-Optic Cable Option		
75	New Fiber-only pole line (200' avg spans, 60-strand ADSS) <ul style="list-style-type: none"> • Includes new wood poles 	\$460,000 / mile
76	Fiber underbuild on new or existing pole line (200' avg spans, 60-strand ADSS) <ul style="list-style-type: none"> • Assumes no replacements of existing poles are needed 	\$211,000 / mile
<u>Notes:</u> <ul style="list-style-type: none"> a) Assumes construction in 2022. b) Add cost of Communications Cabinet – See Items 70-72. c) Assumes no splices are needed along the route. 		
Microwave Option		

Hawaiian Electric Company
APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
INFORMATION

TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
77	Point-to-Point Microwave Link <ul style="list-style-type: none"> • Includes 2 each antenna equipment to create a radio link 	\$836,000 / link
78	50ft Microwave Tower	\$734,000 each
79	100ft Microwave Tower	\$1,066,000 each
<u>Notes:</u> <ol style="list-style-type: none"> a) Assumes construction in 2022. b) Add cost of Communications Cabinet – See Items 70-72. c) Assumes there is radio line-of-site clearance between the communication endpoints. d) Assumes FCC licensed microwave frequencies are available. e) Assumes there are existing structures/buildings with space available on both ends to house the radio equipment. f) Assumes Telecommunications grounding standards are up to date at both sites. g) Assumes 48 V DC power with 12-hour battery backup is available. h) Does not include special site-specific permit/approval activities that may be required including, but not limited to, Neighborhood Board(s), Conservation District Use Application, Environmental Assessment, Shoreline Management Area approval, biological (endangered species or habitat) surveys, and/or cultural (archeological) surveys or the cost of any migration required for approvals to be granted. Proposers should conduct their own due diligence for these costs. i) Assumes space is available at both ends to construct antenna towers or structures that are rated to survive a Saffir-Simpson category 4 hurricane. j) Other options for Microwave Towers of varying heights may be available. 		

2.5 – SECURITY OF COMPANY-OWNED FACILITIES

A. PROPOSER RESPONSIBILITIES AT PROPOSER FACILITY

The Proposer shall be responsible to incorporate security components and systems for **their facilities** that consider the Security Guidelines for the Electricity Sector (CIP-014-2): Physical Security, as published by the North American Electric Reliability Corporation (NERC) and that at a minimum, meet the requirements in Sections 2.1F.

SECTION 3 – [NOT USED]

Hawaiian Electric Company
APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
INFORMATION

SECTION 4 – TYPICAL COMPANY DURATIONS FOR INTERCONNECTION PROJECTS

The tables below in Section 4 are to be used as a reference when developing a schedule (required in Appendix B – Proposer’s Response, Section 2.14) to assist Proposers in setting realistic durations and deadlines for critical milestones. These tables represent typical durations for the Company to complete the listed critical milestones that assist in moving the interconnection project through the IRS, Engineering, Procurement, and Construction phases. The durations below do not include time for Proposer to complete items they are responsible for. These high-level typical durations are for planning purposes only and is not intended to cover all project specific requirements. Specific project details can increase or decrease these durations. The detailed project schedule will be determined after the IRS is completed.

4.1 – DISTRIBUTION PROJECTS (COMPANY-BUILD)

Hawaiian Electric Durations to be Considered in Schedules (12kV and Below) General Guidelines for Planning Purposes Only Hawaiian Electric Build ≥ 1 MW		
Milestone	Duration	Notes
IRS Phase		
Model Validation	2-3 months	May increase depending on # of iterations
System Impact Study (SIS)	150 calendar days	Following Model Acceptance
Facility Study (FS)	40 business days	Following completion of SIS, SLD Acceptance, and Receipt of Developer Drawings and Schedules
Engineering Phase		
30% Design & Review	40 business days	Designs & Reviews for Company-Owned Interconnection Facilities (COIF) & review of Proposer-Owned Interconnection Facilities (SOIF) supporting/impacting COIF
60% Design & Review	50 business days	Designs & Reviews for COIF & review of SOIF supporting/impacting COIF. Following 30% Design acceptance.
90% Design & Review	50 business days	Designs & Reviews for COIF & review of SOIF supporting/impacting COIF. Following 60% Design acceptance
Issued for Construction (IFC) Design & Review	30 business days	Designs & Reviews for COIF & review of SOIF supporting/impacting COIF. Following 90% Design acceptance.
Procurement Phase		
Procurement	9 months	Procurement of materials typically happens at 60% design completion

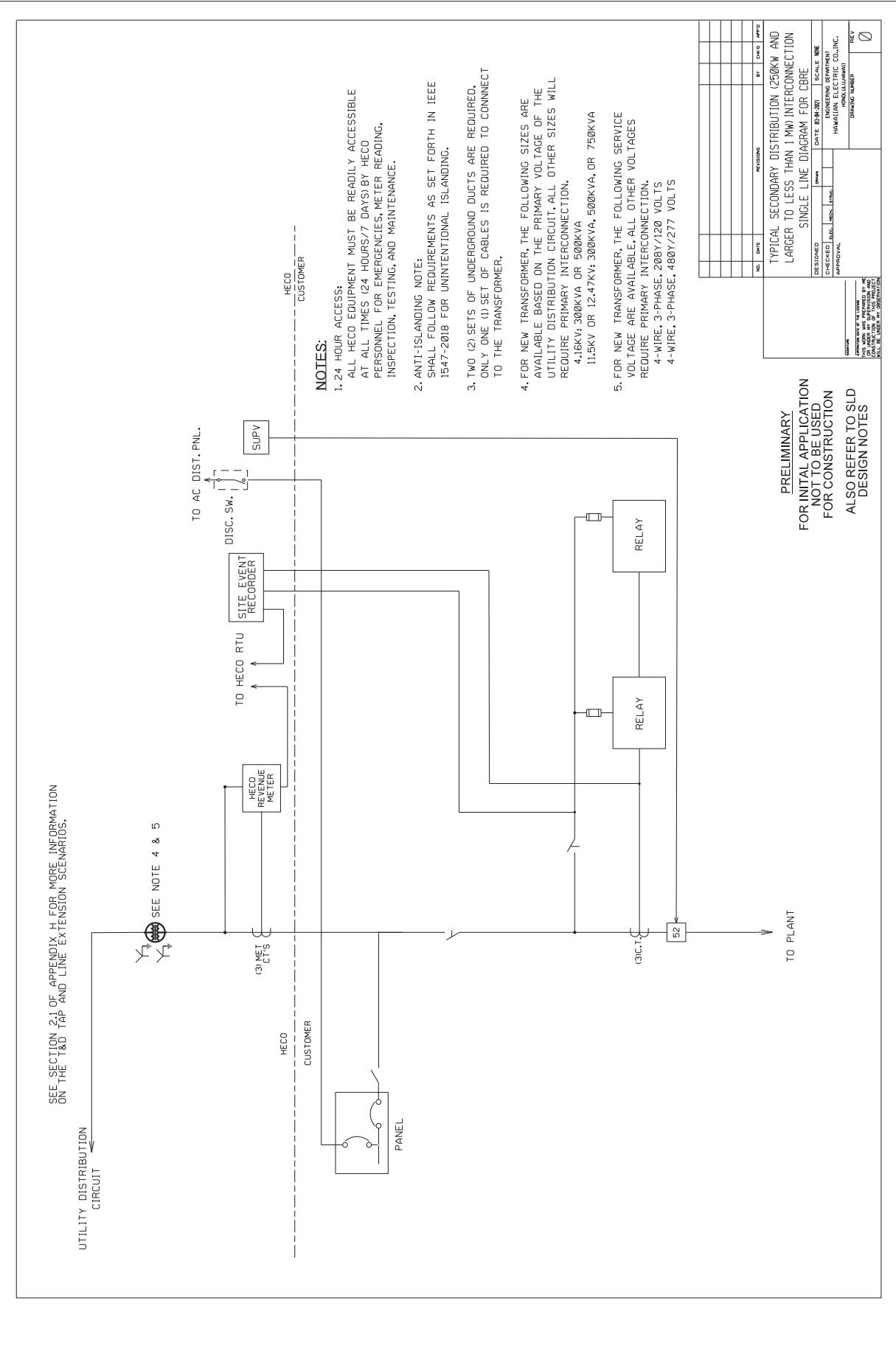
Hawaiian Electric Company
 APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
 INFORMATION

Hawaiian Electric Durations to be Considered in Schedules (12kV and Below) General Guidelines for Planning Purposes Only Hawaiian Electric Build \geq 1 MW		
Milestone	Duration	Notes
Construction Phase		
Construction	7-8 months	Based on scope/complexity of work
Acceptance Testing	10 business days	Approximately 2 weeks after construction completion
CSAT	30 business days	To occur after commissioning of Proposer's Facility. Duration depends on Proposer's ability to meet the Performance Standards. Required for project \geq 1 MW

4.2 – [NOT USED]

4.3 – [NOT USED]

4.4 – [NOT USED]



NOTES:

1. 24 HOUR ACCESS:
ALL HECO EQUIPMENT MUST BE READILY ACCESSIBLE AT ALL TIMES (24 HOURS/7 DAYS) BY HECO PERSONNEL FOR EMERGENCIES, METER READING, INSPECTION, TESTING, AND MAINTENANCE.
2. ANTI-ISLANDING NOTE:
SHALL FOLLOW REQUIREMENTS AS SET FORTH IN IEEE 1547-2018 FOR UNINTENTIONAL ISLANDING.
3. TWO (2) SETS OF UNDERGROUND DUCTS ARE REQUIRED, ONLY ONE (1) SET OF CABLES IS REQUIRED TO CONNECT TO THE TRANSFORMER.
4. FOR NEW TRANSFORMER, THE FOLLOWING SIZES ARE AVAILABLE BASED ON THE PRIMARY VOLTAGE OF THE UTILITY DISTRIBUTION CIRCUIT, ALL OTHER SIZES WILL REQUIRE PRIMARY INTERCONNECTION.
4.16KV: 300KVA OR 500KVA
11.5KV OR 12.47KV: 300KVA, 500KVA, OR 750KVA
5. FOR NEW TRANSFORMER, THE FOLLOWING SERVICE VOLTAGE ARE AVAILABLE, ALL OTHER VOLTAGES REQUIRE PRIMARY INTERCONNECTION.
4-WIRE, 3-PHASE, 208Y/120 VOLTS
4-WIRE, 3-PHASE, 480Y/277 VOLTS

PRELIMINARY
FOR INITIAL APPLICATION
NOT TO BE USED
FOR CONSTRUCTION
ALSO REFER TO SLD
DESIGN NOTES

NO.	DATE	REVISIONS	BY	CHKD	APPD

DESIGNED	DATE	SCALE	NO.
CHECKED	DATE	SCALE	NO.
APPROVAL	DATE	SCALE	NO.
ENGINEERING DEPARTMENT HAWAIIAN ELECTRIC CO., INC. (HAWAIIAN ELECTRIC COMPANY)			
DRAWING NUMBER			REV#
			0

Template Notes to be added to the 12kV PV/BESS (250kW and larger to less than 1MW) Project Single Line Diagram

Additional requirements may be added based on project design.

PROPOSED PROJECT NAME:	
PROPOSED PROJECT SIZE:	
CUSTOMER SLD REVISION NUMBER AND DATE:	
UTILITY SLD REVISION NUMBER AND DATE:	
UTILITY SUBSTATION:	
UTILITY 12KV CIRCUIT:	
UTILITY 12KV CIRCUIT BREAKER #:	

Section A: Planning Notes

A1. If IRS required, by operation procedure(s), the Project shall be paralleled with the utility system only when the _____ (12kV circuit name) 12 kV circuit is in normal operating configuration served via breaker _____ (utility breaker number) at _____ (utility substation name) Substation.

A2. Customer to ensure manual closing of Customer’s main AC kV breaker CB-A (utility# XXXX) shall be allowed only for hot line _____ (utility 12kV circuit) 12 kV line-side) and dead bus (Customer-side) unless otherwise allowed by the Company. There shall be no auto reclosing on Customer’s main AC breaker CB-A (utility# XXXX).

Section B: System Operation Notes

B1. Utility load dispatcher shall be enabled to issue the following to the Customer via DNP 3.0, or other utility-approved protocol interface:

- a. Maximum Power Limit and Power Reference Limit (dispatch) set point control signals. Customer is not allowed to override utility’s curtailment control; and

B2. The following signals provided by the Customer shall be telemetered to Utility load dispatch office:

- a. Status of Customer’s main AC breaker CB-A (utility# XXXX);
- b. Distribution voltage (3 phase L-N);
- c. Facility Power Possible (kW);
- d. Facility Online/Offline Status;
- e. Facility output (kW) that is being exported to Company System;
- f. Facility’s confirmation of a Company control being received and value of that control as implemented.

- B3. The facility equipment should be capable of supporting, at a future date additional telemetry data requested by the Company as applicable:
- a. Distribution line amps (3 phase), frequency, NET kW, NET kVAR, and NET power factor at point of interconnection. Power factor to be a calculated value;
 - b. PV kW and kVAR output;
 - c. BESS kW and kVAR output/charge;
 - d. Received kWh accumulator, sent kWh accumulator, received kVARh accumulator, Sent kVARh accumulator;
 - e. Plane of Array Solar Irradiance in Watts/m²;
 - f. kW output for each inverter;
 - g. Status for each inverter (by DNP status);
 - h. Facility Net Power Possible (kW);
 - i. Volt-Var curve and deadband settings;
 - j. Volt-Var Enabled/Disabled Status;
 - k. Volt-Watt curve and deadband settings;
 - l. Volt-Watt Enabled/Disabled Status;
 - m. Frequency-Watt curve and deadband settings;
 - n. Frequency-Watt Enabled/Disabled Status;
 - o. BESS State of Charge (%);
 - p. BESS Energy remaining (kWH);
 - q. kW set point for each inverter
- B4. The following occurrences shall initiate separate alarm to utility load dispatch office.
- a. RTU Loss of Communication;
 - b. Violation of Maximum Ramp Rate Upward (Performance Standard); and
 - c. Violation of Maximum Ramp Rate Downward (Performance Standard).
- B5. Utility requires 24 hour access to utility-owned SCADA, communication, and utility-owned relaying and monitoring equipment.
- B6. Utility shall own a high-speed digital fault recorder (DFR) (i.e., Tesla Lite Model) near the point of interconnection, which shall be in continuous service and on a rolling window basis monitoring sub-cycle voltages, currents and harmonics, as well as disturbance events and capable of remote interrogation following an event. Utility requires 24 hour access to this equipment. Customer to provide the following hard wired inputs to utility's power quality device:
- a. Status of Customer's main AC breaker CB-A (utility# XXXX);
 - b. line amps (3 phase); and
 - c. line-to-line voltage (3 phase)

Section C: Telecommunication Notes

- C1. Secure and reliable communication is required for the following:

- a. Monitoring and control to/ from Customer's facility;
- b. Revenue metering for power export and consumption readings (for 1MW facility; and
- c. Phone circuits as required.

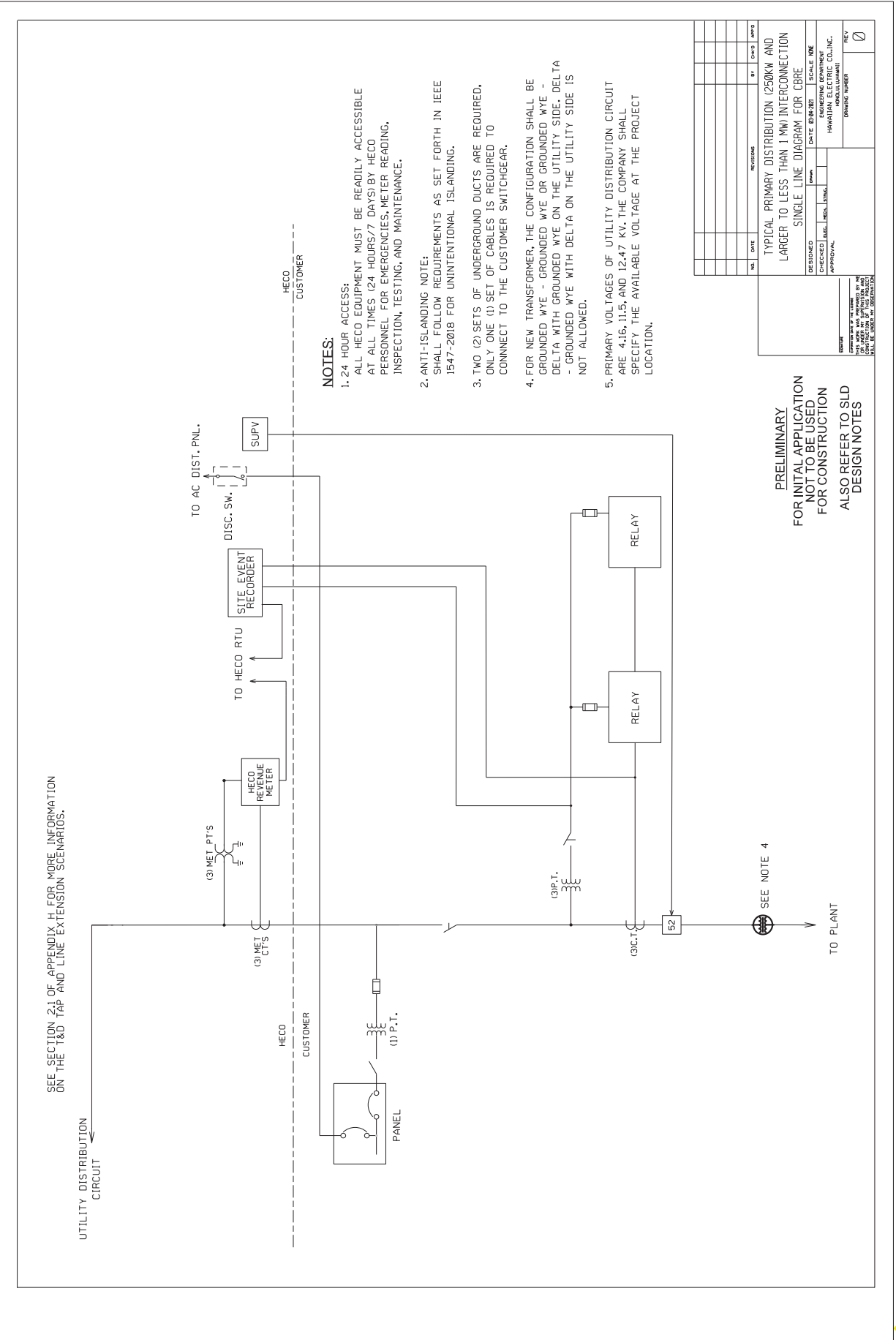
C2. Customer to provide leased service from Hawaiian Telecom as required. Customer to coordinate with utility for details

Section D: Metering Notes

D1. Customer to design revenue metering facilities in accordance with the requirements in Chapter 4 of the Hawaiian Electric Company's Electric Service Installation Manual.

Section E: Design Notes

- E1. Customer to provide a reliable DC source for 12 hour backup period; specific voltage to be determined by utility at a later date.
- E2. Customer to provide a source of station service power for its facility that will remain available when Customer's main AC breaker CB-A (utility# XXXX) is opened and the facility is separated from utility's system.
- E3. PTs and CTs for DFR should be the same quality as the PTs and CTs for the protective relaying.
- E4. Customer to provide raw count (DNP 3.0) for analog points to utility. Customer to provide hardwired dry contact pairs for status points to utility and accept hardwired control points from utility (except for DNP control signals identified in Note B1 and DNP status points identified in Note B3.g).



NOTES:

1. 24 HOUR ACCESS:
ALL HECO EQUIPMENT MUST BE READILY ACCESSIBLE AT ALL TIMES (24 HOURS/7 DAYS) BY HECO PERSONNEL FOR EMERGENCIES, METER READING, INSPECTION, TESTING, AND MAINTENANCE.
2. ANTI-ISLANDING NOTE:
SHALL FOLLOW REQUIREMENTS AS SET FORTH IN IEEE 1547-2018 FOR UNINTENTIONAL ISLANDING.
3. TWO (2) SETS OF UNDERGROUND DUCTS ARE REQUIRED, ONLY ONE (1) SET OF CABLES IS REQUIRED TO CONNECT TO THE CUSTOMER SWITCHGEAR.
4. FOR NEW TRANSFORMER, THE CONFIGURATION SHALL BE GROUNDED WYE - GROUNDED WYE OR GROUNDED WYE - DELTA WITH GROUNDED WYE ON THE UTILITY SIDE. DELTA - GROUNDED WYE WITH DELTA ON THE UTILITY SIDE IS NOT ALLOWED.
5. PRIMARY VOLTAGES OF UTILITY DISTRIBUTION CIRCUIT ARE 4.16, 11.5, AND 12.47 KV. THE COMPANY SHALL SPECIFY THE AVAILABLE VOLTAGE AT THE PROJECT LOCATION.

PRELIMINARY
FOR INITIAL APPLICATION
NOT TO BE USED
FOR CONSTRUCTION
ALSO REFER TO SLD
DESIGN NOTES

NO.	DATE	REVISIONS	BY	DATE	APP'D

TYPICAL PRIMARY DISTRIBUTION (250KW AND LARGER TO LESS THAN 1 MW) INTERCONNECTION SINGLE LINE DIAGRAM FOR CBRE

DATE OF ISSUE: _____
 CHECKED BY: _____
 APPROVAL: _____
 HAWAIIAN ELECTRIC CO., INC.
 HONOLULU, HAWAII
 DRAWING NUMBER: _____
 SCALE: _____
 PROJECT: _____

Template Notes to be added to the 12kV PV/BESS (250kW and larger to less than 1MW) Project Single Line Diagram

Additional requirements may be added based on project design.

PROPOSED PROJECT NAME:	
PROPOSED PROJECT SIZE:	
CUSTOMER SLD REVISION NUMBER AND DATE:	
UTILITY SLD REVISION NUMBER AND DATE:	
UTILITY SUBSTATION:	
UTILITY 12KV CIRCUIT:	
UTILITY 12KV CIRCUIT BREAKER #:	

Section A: Planning Notes

A1. If IRS required, by operation procedure(s), the Project shall be paralleled with the utility system only when the _____ (12kV circuit name) 12 kV circuit is in normal operating configuration served via breaker _____ (utility breaker number) at _____ (utility substation name) Substation.

A2. Customer to ensure manual closing of Customer’s main AC kV breaker CB-A (utility# XXXX) shall be allowed only for hot line _____ (utility 12kV circuit) 12 kV line-side) and dead bus (Customer-side) unless otherwise allowed by the Company. There shall be no auto reclosing on Customer’s main AC breaker CB-A (utility# XXXX).

Section B: System Operation Notes

B1. Utility load dispatcher shall be enabled to issue the following to the Customer via DNP 3.0, or other utility-approved protocol interface:

- a. Maximum Power Limit and Power Reference Limit (dispatch) set point control signals. Customer is not allowed to override utility’s curtailment control; and

B2. The following signals provided by the Customer shall be telemetered to Utility load dispatch office:

- a. Status of Customer’s main AC breaker CB-A (utility# XXXX);
- b. Distribution voltage (3 phase L-N);
- c. Facility Power Possible (kW);
- d. Facility Online/Offline Status;
- e. Facility output (kW) that is being exported to Company System;
- f. Facility’s confirmation of a Company control being received and value of that control as implemented.

- B3. The facility equipment should be capable of supporting, at a future date additional telemetry data requested by the Company as applicable:
- a. Distribution line amps (3 phase), frequency, NET kW, NET kVAR, and NET power factor at point of interconnection. Power factor to be a calculated value;
 - b. PV kW and kVAR output;
 - c. BESS kW and kVAR output/charge;
 - d. Received kWh accumulator, sent kWh accumulator, received kVARh accumulator, Sent kVARh accumulator;
 - e. Plane of Array Solar Irradiance in Watts/m²;
 - f. kW output for each inverter;
 - g. Status for each inverter (by DNP status);
 - h. Facility Net Power Possible (kW);
 - i. Volt-Var curve and deadband settings;
 - j. Volt-Var Enabled/Disabled Status;
 - k. Volt-Watt curve and deadband settings;
 - l. Volt-Watt Enabled/Disabled Status;
 - m. Frequency-Watt curve and deadband settings;
 - n. Frequency-Watt Enabled/Disabled Status;
 - o. BESS State of Charge (%);
 - p. BESS Energy remaining (kWH);
 - q. kW set point for each inverter
- B4. The following occurrences shall initiate separate alarm to utility load dispatch office.
- a. RTU Loss of Communication;
 - b. Violation of Maximum Ramp Rate Upward (Performance Standard); and
 - c. Violation of Maximum Ramp Rate Downward (Performance Standard).
- B5. Utility requires 24 hour access to utility-owned SCADA, communication, and utility-owned relaying and monitoring equipment.
- B6. Utility shall own a high-speed digital fault recorder (DFR) (i.e., Tesla Lite Model) near the point of interconnection, which shall be in continuous service and on a rolling window basis monitoring sub-cycle voltages, currents and harmonics, as well as disturbance events and capable of remote interrogation following an event. Utility requires 24 hour access to this equipment. Customer to provide the following hard wired inputs to utility's power quality device:
- a. Status of Customer's main AC breaker CB-A (utility# XXXX);
 - b. line amps (3 phase); and
 - c. line-to-line voltage (3 phase)

Section C: Telecommunication Notes

- C1. Secure and reliable communication is required for the following:

- a. Monitoring and control to/ from Customer's facility;
- b. Revenue metering for power export and consumption readings (for 1MW facility; and
- c. Phone circuits as required.

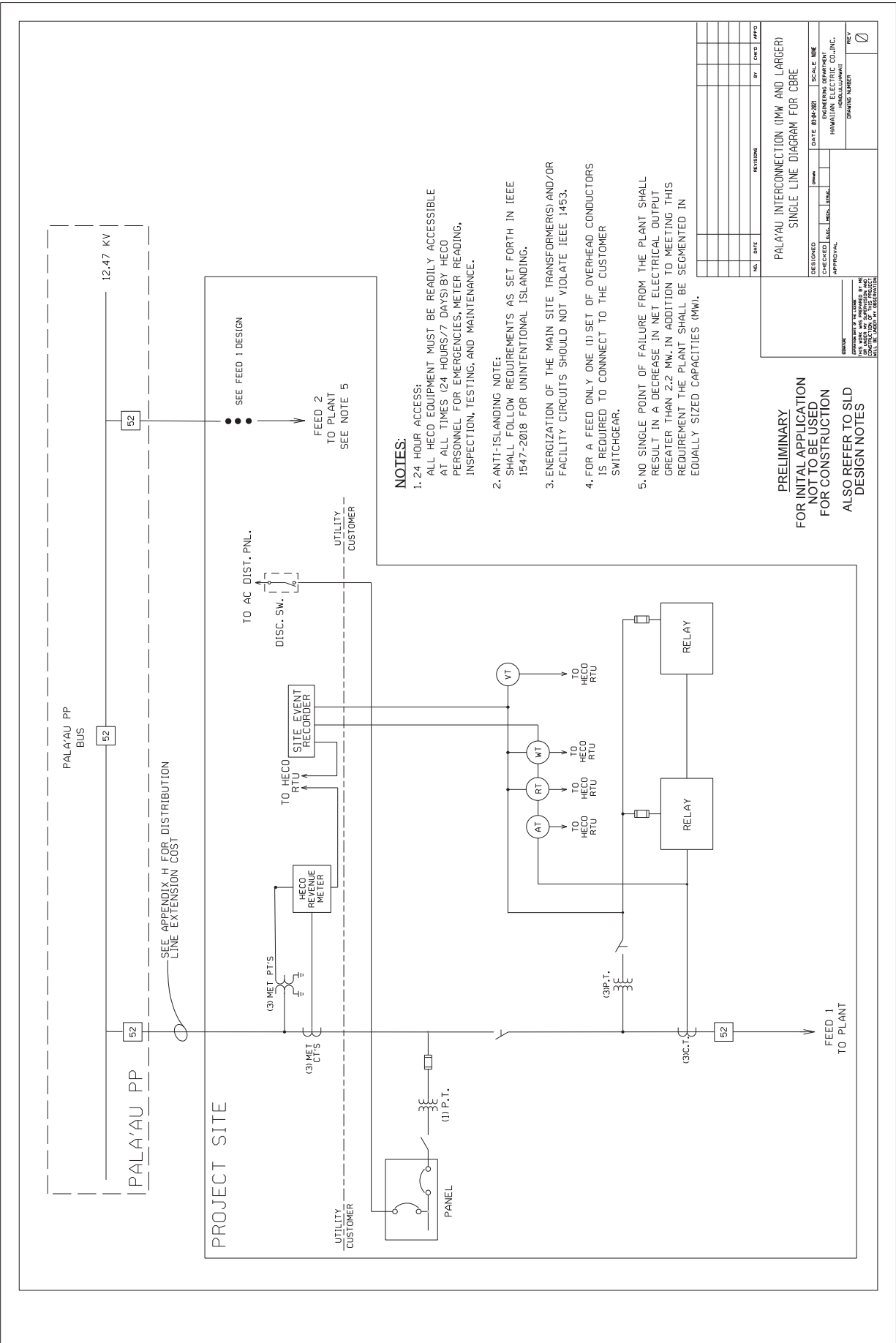
C2. Customer to provide leased service from Hawaiian Telecom as required. Customer to coordinate with utility for details

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D1. Customer to design revenue metering facilities in accordance with the requirements in Chapter 4 of the Hawaiian Electric Company's Electric Service Installation Manual.

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- E1. Customer to provide a reliable DC source for 12 hour backup period; specific voltage to be determined by utility at a later date.
- E2. Customer to provide a source of station service power for its facility that will remain available when Customer's main AC breaker CB-A (utility# XXXX) is opened and the facility is separated from utility's system.
- E3. PTs and CTs for DFR should be the same quality as the PTs and CTs for the protective relaying.
- E4. Customer to provide raw count (DNP 3.0) for analog points to utility. Customer to provide hardwired dry contact pairs for status points to utility and accept hardwired control points from utility (except for DNP control signals identified in Note B1 and DNP status points identified in Note B3.g).



NOTES:

1. 24 HOUR ACCESS:
ALL HECO EQUIPMENT MUST BE READILY ACCESSIBLE AT ALL TIMES (24 HOURS/7 DAYS) BY HECO PERSONNEL FOR EMERGENCIES, METER READING, INSPECTION, TESTING, AND MAINTENANCE.
2. ANTI-ISLANDING NOTE:
SHALL FOLLOW REQUIREMENTS AS SET FORTH IN IEEE 1547-2018 FOR UNINTENTIONAL ISLANDING.
3. ENERGIZATION OF THE MAIN SITE TRANSFORMER(S) AND/OR FACILITY CIRCUITS SHOULD NOT VIOLATE IEEE 1453.
4. FOR A FEED ONLY ONE (1) SET OF OVERHEAD CONDUCTORS IS REQUIRED TO CONNECT TO THE CUSTOMER SWITCHGEAR.
5. NO SINGLE POINT OF FAILURE FROM THE PLANT SHALL RESULT IN A DECREASE IN NET ELECTRICAL OUTPUT GREATER THAN 2.2 MW IN ADDITION TO MEETING THIS REQUIREMENT THE PLANT SHALL BE SEGMENTED IN EQUALLY SIZED CAPACITIES (MW).

PRELIMINARY
FOR INITIAL APPLICATION
NOT TO BE USED
FOR CONSTRUCTION
ALSO REFER TO SLD
DESIGN NOTES

REVISIONS		DATE	BY	CHKD	APPD

PALAU INTERCONNECTION (1MW AND LARGER)
SINGLE LINE DIAGRAM FOR CBRE

DESIGNED	DATE DRAWN	SCALE
CHECKED	DATE	SCALE
APPROVAL	DATE	SCALE

DESIGNED BY: HAWAIIAN ELECTRIC CO., INC.
DRAWING NUMBER: 0

DATE: 01/11/2018

SCALE: 1"=100'

PROJECT: PALAU INTERCONNECTION (1MW AND LARGER)

PROJECT EXAMPLES (MOLOKA'I) - APPENDIX H UNIT COST TABLE

Examples provided for illustrative purposes only and is not binding for actual facility costs.
Estimated costs represent Company costs charged to the Proposer.

250 KW Projects interconnecting to a distribution circuit (secondary interconnection)

Example 1

250kW PV system with secondary interconnection. Line extension includes tap to existing UG fused feeder and 400ft UG to Company transformer. Proposer to install 12kV civil infrastructure. Proposer site built per Attachment 1 of this Appendix H. Proposer to provide cellular communications with another provider. Company to install communications enclosure.

Appx H Item	Description	Quantity	Unit	Unit Price (\$)	Total Cost (\$)
1	Company work at Proposer site	1	EA	\$390,000	\$468,000
4	Tap to UG FF (sec interconnection)	1	EA	\$206,000	\$206,000
33	12kV UG	0.06	MI	\$804,000	\$45,682
	12kV civil infrastructure (by Proposer)	1	LS	\$0	\$0
70	Comm Enclosure (< 1MW)	1	EA	\$43,000	\$52,000
73	Cellular line (by Proposer)	1	EA	\$0	\$0
			ESTIMATED TOTAL =		\$771,682

250 KW Projects interconnecting to a distribution circuit (primary interconnection)

Example 2

250kW PV system interconnecting to an existing 12kV UG circuit. Line extension includes tap to existing UG main and 200ft UG to Company switchgear. Proposer requested additional feeder. Proposer to install 12kV civil infrastructure. Proposer site built per Attachment 2 of this Appendix H. Proposer to provide cellular communications with another provider. Company to install communications enclosure.

Appx H Item	Description	Quantity	Unit	Unit Price (\$)	Total Cost (\$)
10	Company work at Proposer site	1	EA	\$468,000	\$468,000
12	Tap to UG Main (primary interconnection)	1	EA	\$162,000	\$162,000
33	12kV UG	0.02	MI	\$804,000	\$15,227
34	12kV UG add'l feeder	0.04	MI	\$482,000	\$19,170
	12kV civil infrastructure (by Proposer)	1	LS	\$0	\$0
70	Comm Enclosure (< 1MW)	1	EA	\$43,000	\$52,000
73	Cellular line (by Proposer)	1	EA	\$0	\$0
			ESTIMATED TOTAL =		\$716,398

Pala'au Interconnection

Example 3

2.5MW project interconnecting to Pala'au substation. Project interconnects with two (2) outgoing feeders to Pala'au, sized at 1.25MW each. The 12kV line extension for each feeder includes 200ft total UG. Each feeder risers and taps to a single OH line extension 0.25 miles long. All lines are accessible. Proposer to install 12kV civil infrastructure. Proposer site built per Attachment 3 of this Appendix H (Pala'au Interconnection for Projects 1 MW or larger). Proposer to provide leased line telecommunications with another provider; back-up communications is required. Company to install Company-owned equipment in Proposer-provided communications cabinet at Proposer site.

Appx H Item	Description	Quantity	Unit	Unit Price (\$)	Total Cost (\$)
21	Company work at Proposer site	2	EA	\$486,000	\$972,000
22	Company work at Pala'au PP	2	EA	\$600,000	\$1,200,000
24	UG Termination to OH Extension	2	EA	\$114,000	\$228,000
30	12kV OH accessible	0.5	MI	\$773,000	\$386,500
33	12kV UG	0.04	MI	\$804,000	\$30,455
35	12kV 3ph riser	2	EA	\$45,000	\$90,000
72	Comm Cabinet (SCADA, 2 circuits)	1	EA	\$192,000	\$192,000
73	Primary Leased line (by Proposer)	1	LS	\$0	\$0
73	Backup Leased line (by Proposer)	1	LS	\$0	\$0
			ESTIMATED TOTAL =		\$3,098,955

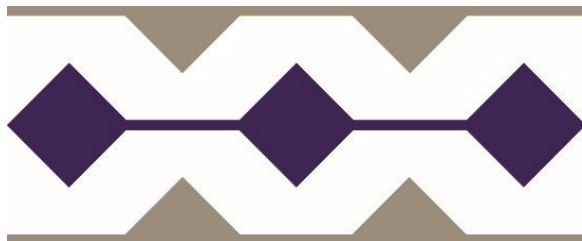
DRAFT
REQUEST FOR PROPOSALS
FOR
COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

March 30, 2021

Docket No. 2015-0389

Appendix I – Grid Needs Assessment



**Maui
Electric**

This Appendix provides the definitions for the grid services considered in the CBRE RFPs and charts for the grid needs and marginal avoided cost values. The grid services were defined as part of the Integrated Grid Planning (“IGP”) Solution Evaluation & Optimization Working Group (“SEOWG”) activities. Bidders may use the information provided in this appendix to understand the grid needs in order to structure their proposals to provide the most value to the Company.

Grid Service Definitions

The following grid services are used to identify the grid needs.

Table 1: Grid Service Definitions

Grid Service	Definition
Energy	A continuous, controllable, and predictable supply of megawatt-hours to serve system load needs in response to Company Dispatch. ¹
Regulating Reserves	A reserve capacity provided by generating and load resources to allow continuous energy balance over the next 1 minute and 20 to 30-minute time interval due to the variability in renewable resources and load that can be called upon in response to Company Dispatch

Grid Needs

The charts below describe the seasonal and annual hourly need for the services described in Table 1.

¹ “Company Dispatch” as defined in the PPA and SFC means Company’s right, through supervisory equipment or otherwise, to direct or control both the capacity and the energy output of the Facility from its minimum output rating to its maximum output rating consistent with this Agreement (including, without limitation, Good Engineering and Operating Practices and the requirements set forth in Section 3 (Performance Standards) of Attachment B (Facility Owned by Subscriber Organization to this Agreement), which dispatch shall include real power, reactive power, voltage, frequency, the determination to cycle a unit off-line or to restart a unit, the droop control setting, the ramp rate setting, and other characteristics of such electric energy output whose parameters are normally controlled or accounted for in a utility dispatching system.

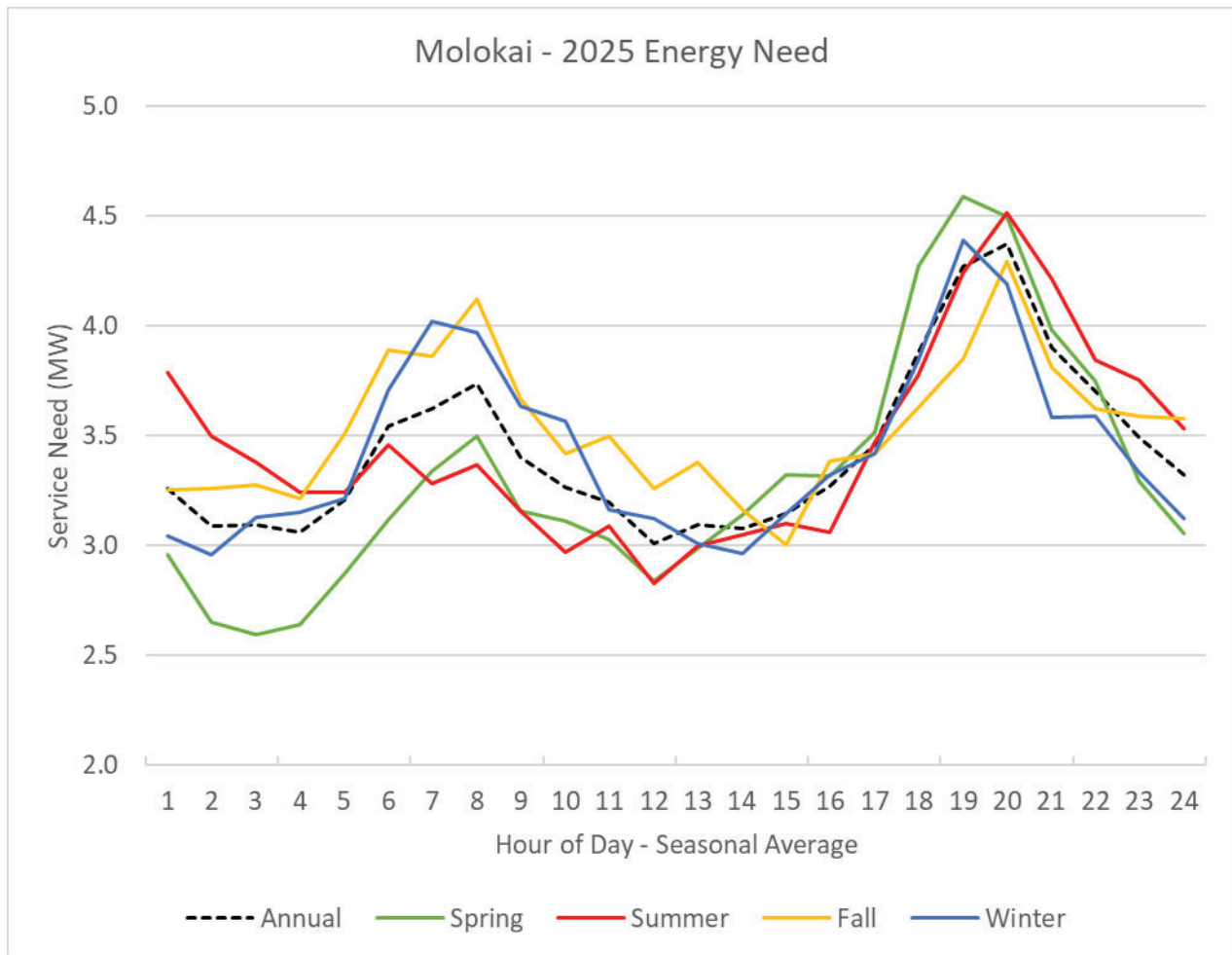


Figure 1: Moloka'i 2025 Need for Energy

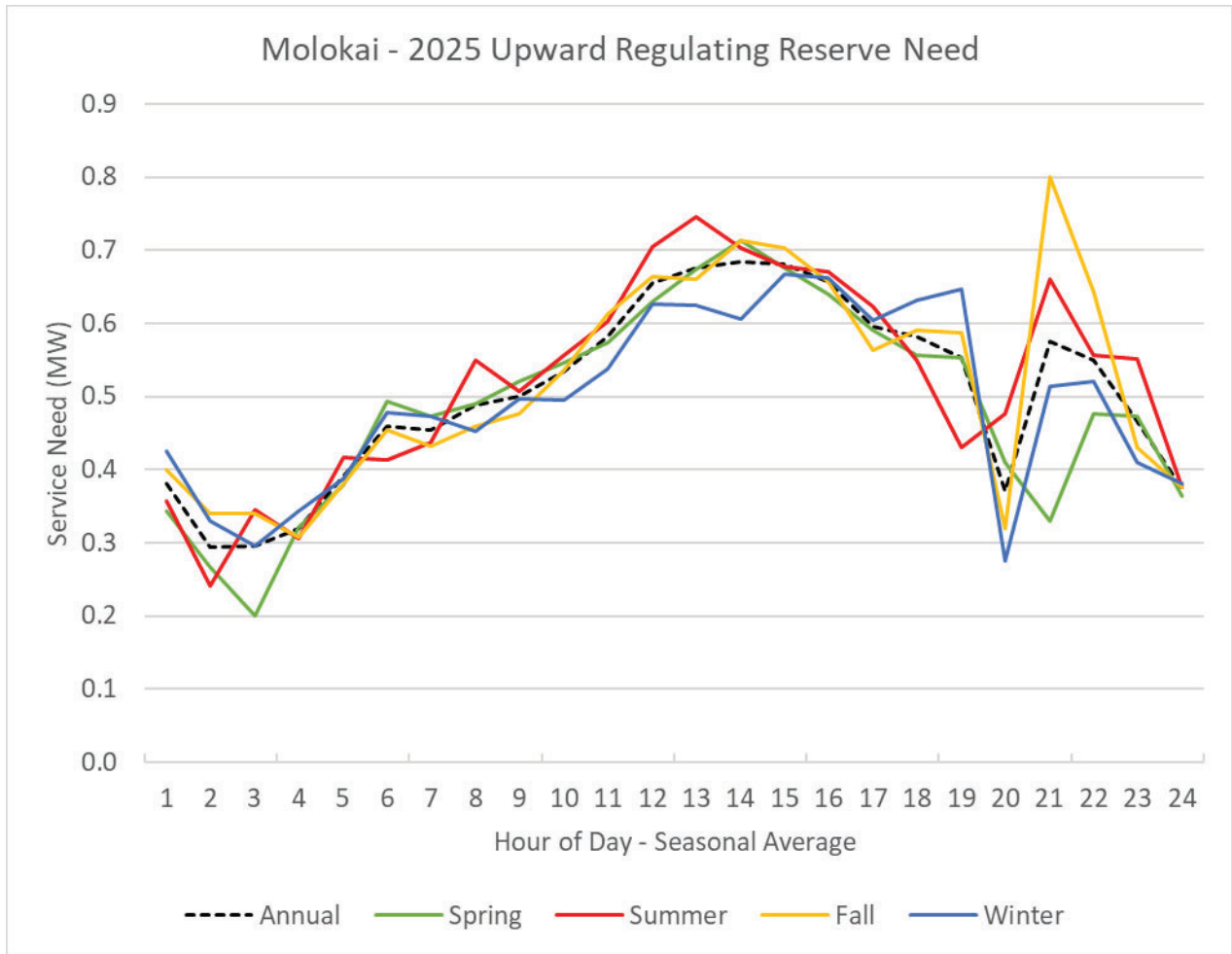


Figure 2: Moloka'i 2025 Need for Upward Regulating Reserve

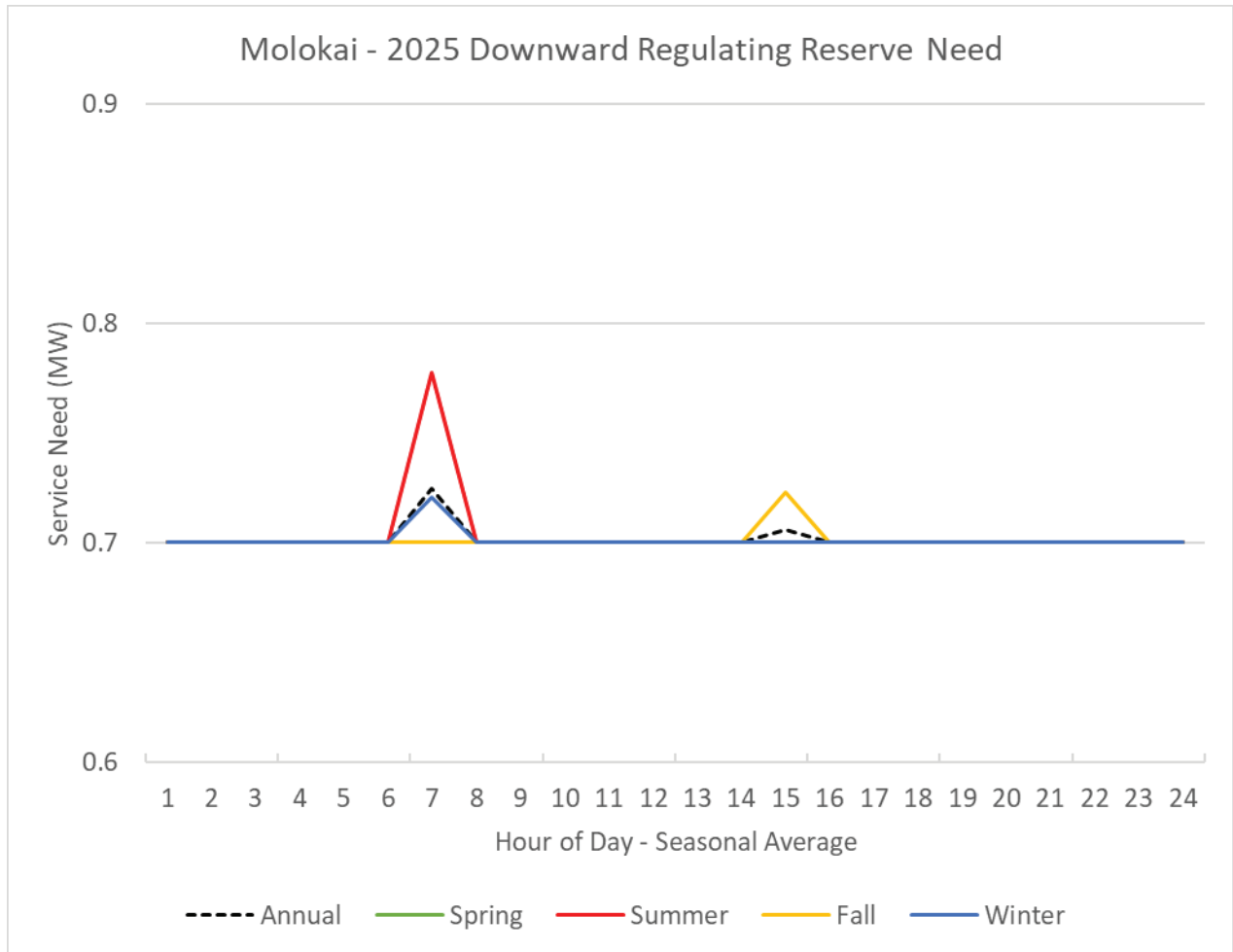


Figure 3: Moloka'i 2025 Need for Downward Regulating Reserve

Grid Service Values

The charts below provide the relative marginal avoided costs for the grid services provided in Table 1.

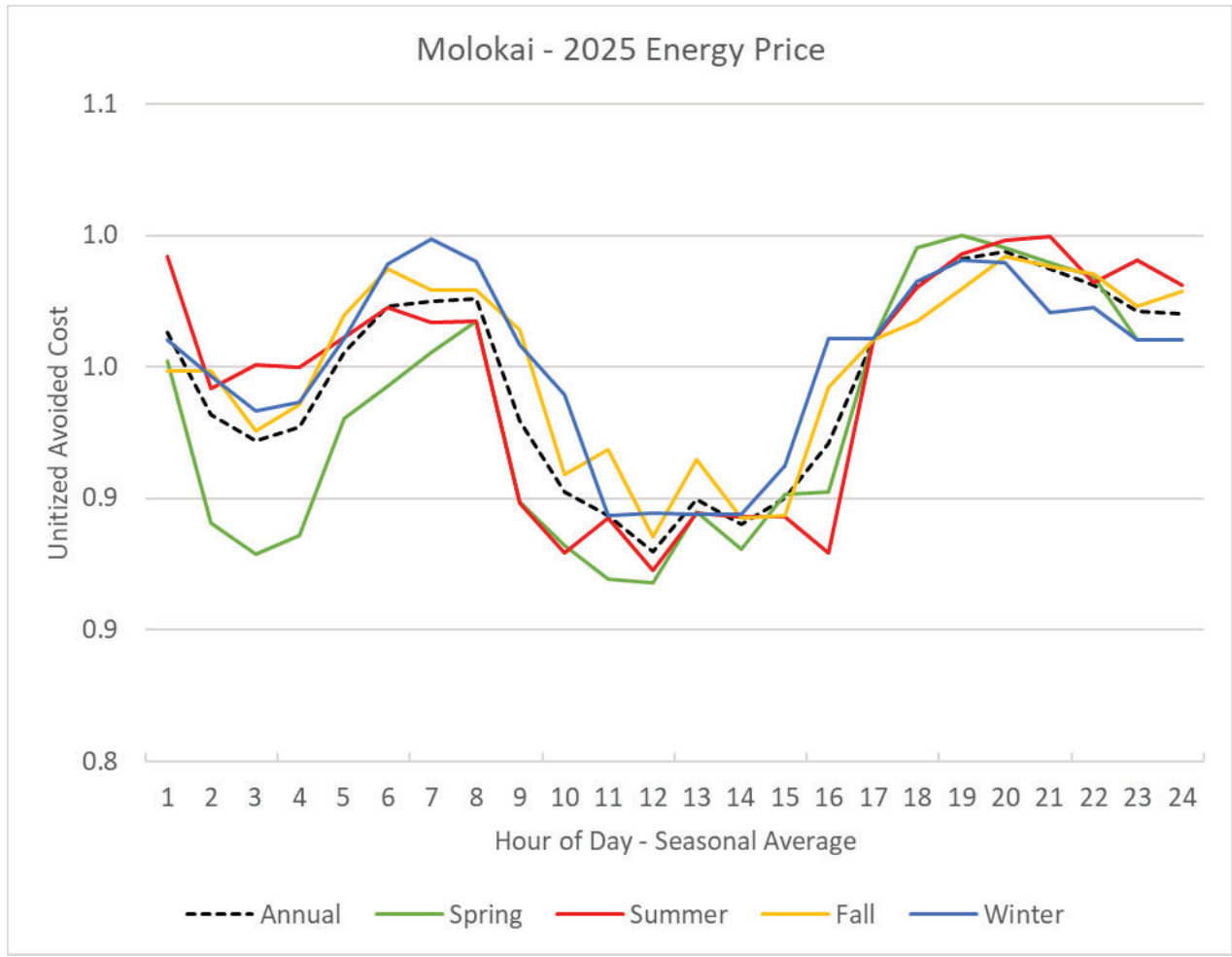


Figure 4: Moloka'i 2025 Price for Energy

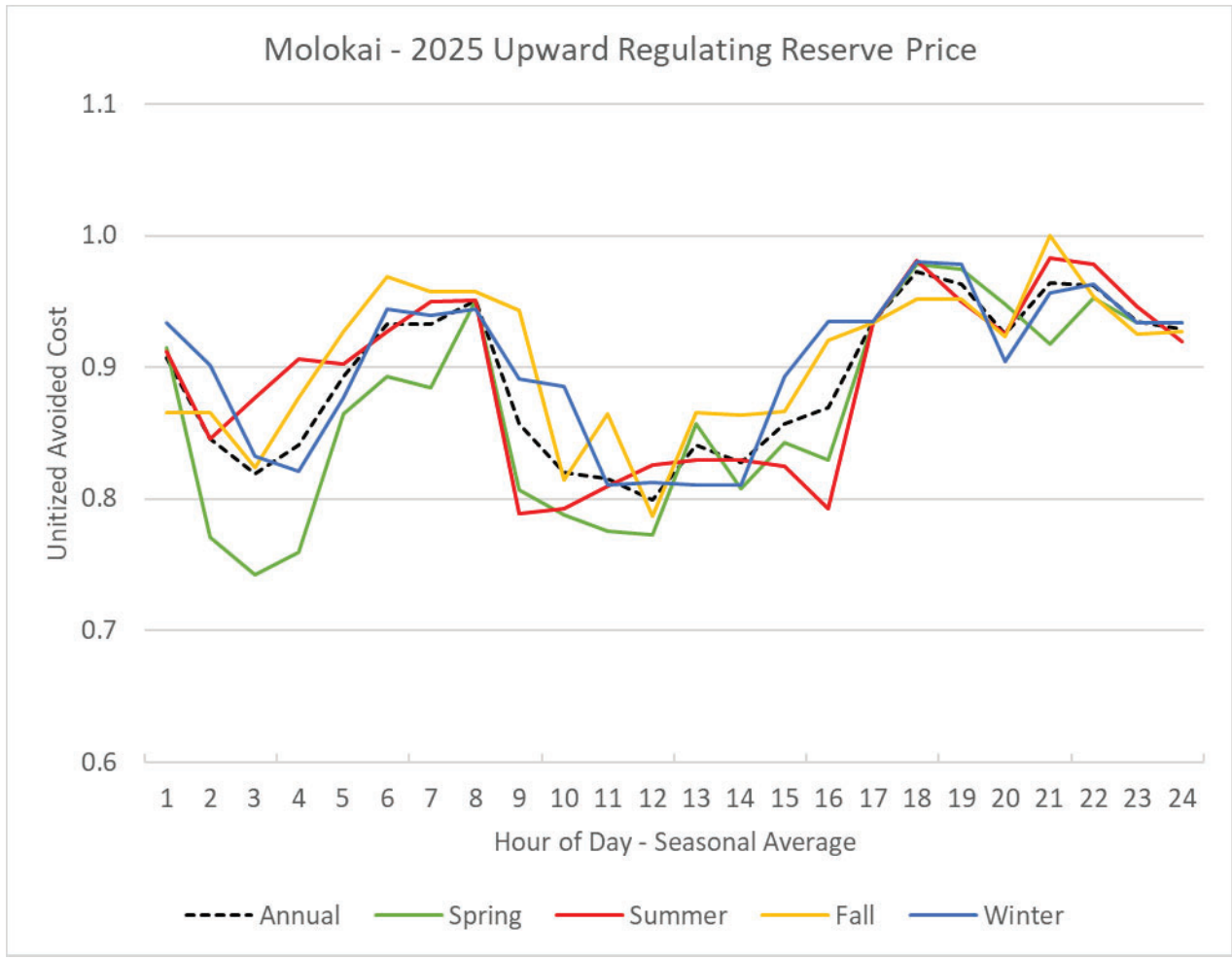


Figure 5: Moloka'i 2025 Price for Upward Regulating Reserve

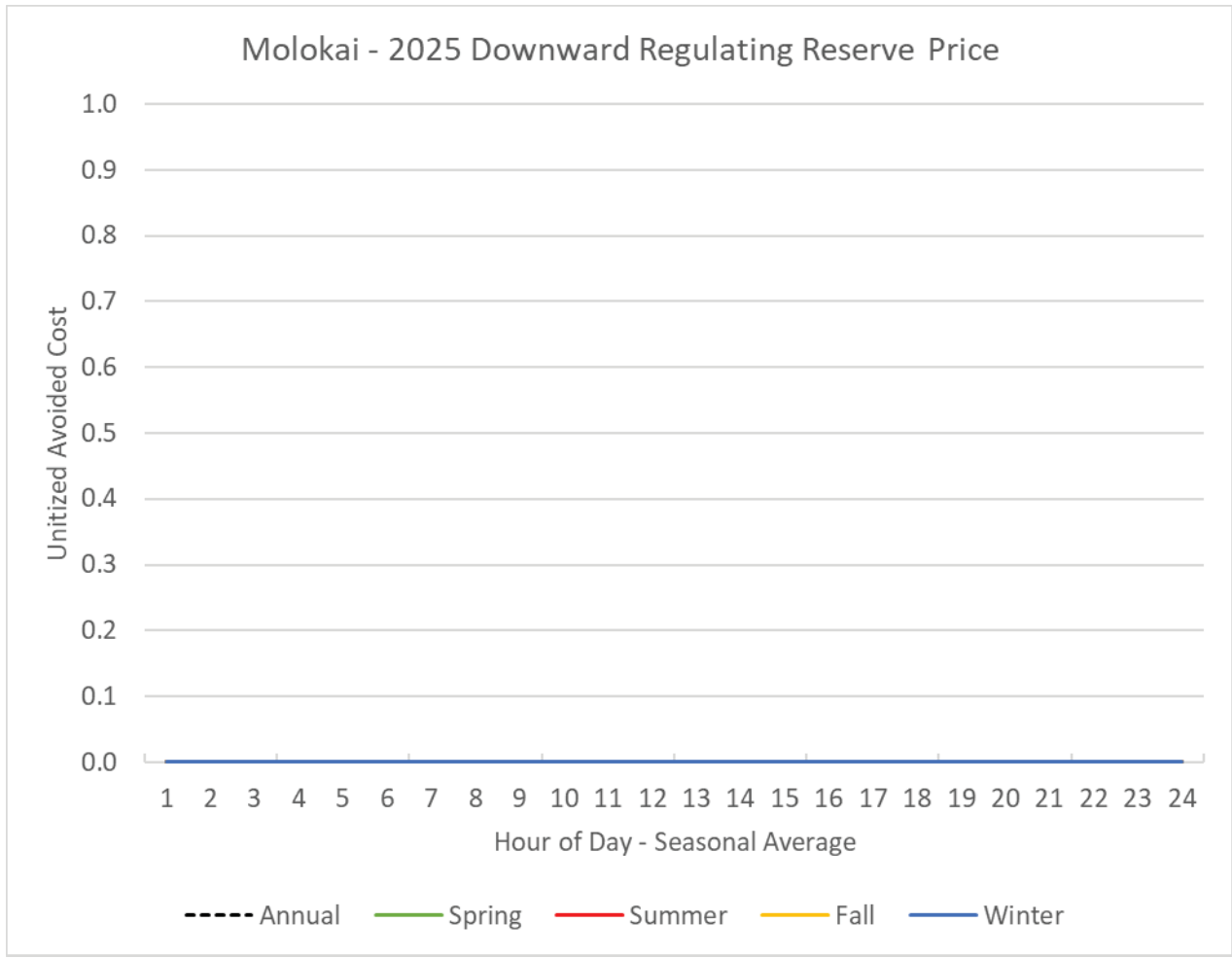


Figure 6: Moloka'i 2025 Price for Downward Regulating Reserve

DRAFT

REQUEST FOR PROPOSALS

FOR

COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

Appendix J – Rule 29 Tariff

[NOTE: Please refer to Exhibit 4 of the March 30, 2021 filing for the proposed Maui Electric Rule No. 29 CBRE Phase 2.]



**Maui
Electric**

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FOR
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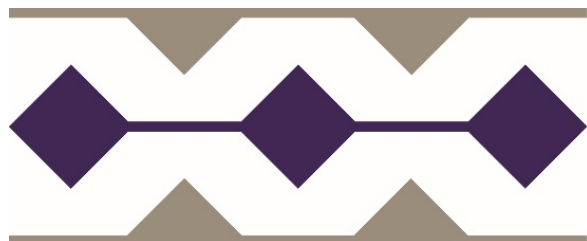
ISLAND OF MOLOKA‘I

MARCH 30, 2021

Docket No. 2015-0389

*Appendix K – Model PV Mid-Tier Standard Form
Contract*

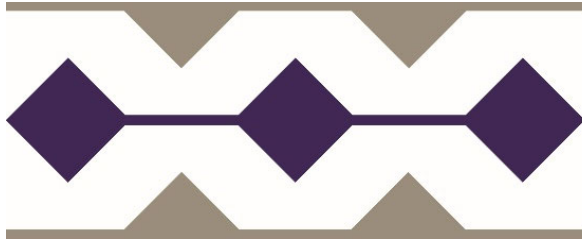
**[NOTE: Please refer to Exhibit 9 of the March 30, 2021 filing for the Draft
Mid-Tier Standard Form Contract For Renewable Dispatchable Generation.]**



**Maui
Electric**

EXHIBIT 8

Draft RFP for Variable Renewable Dispatchable Generation
Paired with Energy Storage and CBRE for Lanai



**Maui
Electric**

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

MARCH 30, 2021

Docket No. 2015-0389

This Request for Proposals (“RFP”) is a DRAFT only. Maui Electric Company, Ltd. (“Maui Electric”) will employ a competitive bidding process to select renewable energy projects including Community Based Renewable Energy consistent with the State of Hawai‘i Public Utilities Commission’s (“PUC”) Competitive Bidding Framework. Under the Competitive Bidding Framework. Maui Electric filed drafts of the RFP with the (PUC). The proposed final RFP is being submitted to the PUC for approval and is subject to further revision based upon direction received from the PUC. After approval by the PUC, Maui Electric will issue the final RFP.

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Appendix K	Lāna'i Community Comments
Appendix L	Lāna'i RDG PPA (PV+Storage only)
Appendix M	Term Sheet for Large CBRE DC-Coupled Projects (PV + BESS)

Chapter 1: Introduction and General Information

Maui Electric Company, Ltd. (“Maui Electric” or the “Company”) seeks proposals for the supply of qualified variable renewable dispatchable generation paired with energy storage for the Maui Electric System on the island of Lāna‘i in accordance with this Request for Proposals (“RFP”). The total amount of variable renewable dispatchable generation being solicited in this RFP is 35,800 megawatt hours (“MWh”) annually of photovoltaic (“PV”) paired with a Battery Energy Storage System (“BESS”) in a single project. The BESS must be sized to store at least 70 percent of the photovoltaic energy.¹ Of the total amount of capacity being solicited 3 MW must be reserved for Community-Based Renewable Energy (“CBRE”), also referred to as shared solar². The total targeted amount assumes Lāna‘i Sustainability Research (“LSR”) and Mānele Bay Combined Heat and Power (“CHP”) facilities are no longer available as further described in this RFP.

The Company or its Affiliates may submit a Proposal in response to this RFP subject to the requirements of this RFP.

The Company seeks a PV project that is paired with a BESS in this RFP. The Company intends to contract for a single project through this RFP using its Model Renewable Dispatchable Generation Power Purchase Agreement (“RDG PPA”), which treats variable renewable generation facilities as fully dispatchable. The Company has created a PV + BESS version of its RDG PPA attached as Appendix L to this RFP.³

The successful Proposer will provide variable renewable dispatchable generation paired with a BESS to the Company pursuant to the terms of the RDG PPA, which will be subject to review and approval by the State of Hawai‘i Public Utilities Commission (“PUC”).

The Company’s RDG PPA employs an innovative contracting mechanism which is very different than traditional PPA structures. Proposers are instructed to thoroughly review the RDG PPA attached as Appendix L. The structure of the RDG PPA intends to provide payments to the Proposer by the Company on a monthly lump sum basis, based upon the energy potential of the facility, regardless of the actual energy dispatched. In exchange, the utility maintains full dispatch control of the Facility as needed. Under the RDG PPA, each Facility must meet certain requirements to receive the full lump sum payment each month. These requirements ensure that the plant is available to the Company for dispatch to meet system needs.

The Company will evaluate Proposals using the evaluation and selection process described in Chapter 4. The Company will evaluate and select a Proposal based on both price and non-price

¹ For example, 17.5MW/35,800MWh of PV paired with 17.5MW/70MWh energy storage or 14MW/35,800 MWh of PV paired with 15 MW/70MWh energy storage.

² In response to some confusion in the community over the acronym “CBRE” that the Companies have experienced during its latest efforts to publicize the CBRE Program, the Companies are introducing the more descriptive term “shared solar” for the CBRE Program in an effort to alleviate any further confusion in the community. The Companies intent is to use both terms, “CBRE” in regulatory filings and “shared solar” in marketing and other Company literature to refer to the Community-Based Renewable Energy Program first introduced by the CBRE Framework. The term, “shared solar” will be used even though the CBRE Program is not necessarily limited to PV projects only.

³ The RDG PPA for PV + BESS is available on the Company’s RFP website and through the Electronic Procurement Platform for the RFP.

factors that impact the Company, its customers, and communities affected by the proposed Project.

All requirements necessary to submit a Proposal(s) are stated in this RFP. A description of the technical requirements for Proposers is included in the body of this RFP, Appendix B, and in the RDG PPA attached as Appendix L.

All capitalized terms used in this RFP shall have the meaning set forth in the glossary of defined terms attached as Appendix A. Capitalized terms that are not included in Appendix A shall have the meaning ascribed in this RFP.

1.1 Authority and Purpose of the Request for Proposals

- 1.1.1 This RFP is issued in response to Order No. 36776 issued on November 15, 2019 in Docket No. 2019-0178 and Order No. 37070 issued on April 20, 2020 and Order No. 37139 issued on May 14, 2020 in Docket No. 2015-0389 as part of a procurement process established by the PUC. On June 8, 2020, the Company filed a letter in Docket No. 2019-0178 explaining its intention to combine its Request for Proposals for Variable Renewable Dispatchable Generation Paired with Energy Storage, Island of Lāna‘i with the Community Based Renewable Energy Request for Proposals for the Island of Lāna‘i specified in Order No. 37070.
- 1.1.2 This RFP is subject to Decision and Order (“D&O”) No. 23121 in Docket No. 03-0372 (To Investigate Competitive Bidding for New Generating Capacity in Hawai‘i), which sets forth the PUC’s Framework for Competitive Bidding (“Framework” or “Competitive Bidding Framework”).
- 1.1.3 Proposers should review Appendix I, Grid Needs Assessment, to inform Proposers as to the system needs and costs based on inputs and assumptions developed through the Company’s integrated grid planning process, and recent renewable dispatchable generation procurements.⁴ The Grid Needs Assessment is intended to inform the development of their Proposals that best meets the needs of the system.

1.2 Scope of the RFP

- 1.2.1 The targeted amount of variable renewable dispatchable generation is 35,800 MWh annually. This amount assumes both the LSR and CHP facilities will be removed from service. The Company consulted with the Independent Observer during the selection of the targeted amount of variable renewable dispatchable generation and the modeling assumptions, including assumptions of maximum displacement of fossil generation.
- 1.2.2 The Company will only accept Proposals that utilize PV technology combined with a BESS and include a CBRE portion as specified in this Chapter 1. No other generation technologies may be proposed.

⁴ See <https://www.hawaiianelectric.com/clean-energy-hawaii/our-clean-energy-portfolio/renewable-project-status-board>

- 1.2.3 The proposed Project must reserve 3 MW of its contract capacity for the Project’s CBRE portion (the “CBRE Project”). The Proposer’s CBRE Project must meet the CBRE Program and eligibility requirements identified in Part II of Rule 29 Community-Based Renewable Energy Program Phase 2 attached as Appendix J. Throughout the term of the RDG PPA, the Proposer shall endeavor to achieve 3 MW of CBRE subscriptions at all times and will be required to accept eligible CBRE subscriptions up to 3 MW. Notwithstanding the required 3 MW CBRE Project capacity, only the first 1 MW of CBRE Project capacity shall be subject to the CBRE Project subscription requirements for (a) number of CBRE Subscribers, (b) limit on percentage of Unsubscribed RDG for the CBRE portion of the Project, (c) minimum percentage of residential Subscribers and (d) any Proposer-submitted Low to Moderate Income (“LMI”) Subscriber percentage for the CBRE Project. Accordingly, and to ensure understanding of the above, at least 1 MW of CBRE subscriptions is required for purposes of determining whether liquidated damages are assessed under Rule 29, and the CBRE Project will not be measured or assessed liquidated damages on CBRE subscriptions above 1 MW. Such provisions are more fully set forth in the RDG PPA.
- 1.2.4 Based on the required 1 MW of subscriptions for the CBRE Project, under Rule 29, at least 40% or 400 kilowatts (kW) (0.40 MW) must be reserved for residential Subscribers. Preference will be given to proposed Projects that reserve an amount greater than 0.40 MW for residential Subscribers. In addition, preference will be given to proposed Projects that reserve a percentage of CBRE subscriptions for LMI Customers, as defined in Rule 29. As these Proposer-submitted percentages (for residential and/or LMI subscriptions) will be used and evaluated in the RFP evaluation process, Proposers will be held to their provided values. Additional liquidated damages, to a lesser extent, may be assessed if a Proposer fails to meet the greater amount of residential Subscribers (above 40%) or LMI Customers (any percentage) that a Proposer commits to in its Proposal. Proposers are directed to Rule 29 which more fully sets forth such terms.
- 1.2.5 Each Proposal submitted in response to this RFP must represent a Project that is capable of meeting the requirements of this RFP without having to rely on the completion or implementation of any other Project, or without having to rely on a proposed change in law, rule, or regulation.
- 1.2.6 Proposed Projects must be located on the Site specified in Section 3.11; no other Project locations may be proposed. Projects must interconnect to the Company’s System at the Miki Basin switchyard located on the Island of Lāna‘i (see Section 3.11 and Appendix F).
- 1.2.7 To prevent adverse impacts to a single point of failure of 2.2 MW the interconnection designs must limit single point of failure to no greater than 2.2 MW to meet this requirement. When dispatched by the Company, the Facility must be configured such that no single point of failure from the equipment will exceed 2.2 MW loss to the interconnection. Revisions will need to be made to the RDG PPA to account for multiple points of interconnection. The Company will provide such revisions upon completion of the Interconnection Requirements Study for the Final Award Group.

- 1.2.8 The contract for the project selected through this RFP shall use the RDG PPA, as described in Section 3.8. Under the RDG PPA, the Company will maintain exclusive rights to fully direct dispatch of the Facility, subject to availability of the resource and Section 1.2.9 below. The term of the PPA will be 20 years.
- 1.2.9 Proposals must be submitted with a BESS component. The BESS component can be charged during periods when full potential export of the generation Facility is not being dispatched by the Company and can be used to provide energy to the Company during other times that are beneficial to the system. The BESS component must be able to store and discharge 70 percent of the PV produced energy, continuously charge and discharge at a minimum of 10 MVA (8.5 MW at a 0.85 power factor), and be sufficiently sized to be capable of accepting the rated power (MW) capacity of the paired PV system and achieve the energy target throughout the term of the PPA.
- 1.2.10 After the 5-year federal Investment Tax Credit (“ITC”) recapture period has lapsed, the energy storage component must be capable of being 100% charged from the grid at the direction of the Company. BESS components that are incapable of claiming the ITC must be capable of being 100% charged from the grid from the GCOD.
- 1.2.11 The maximum amount of energy discharged from the BESS component in a year will be limited to 70 percent of the MWh target (or approximately 70 MWh) BESS contract capacity multiplied by the number of Days in that year. The BESS component may be dispatched more than once per Day, subject to such discharge energy limitations.
- 1.2.12 Proposals must specify a Guaranteed Commercial Operations Date (“GCOD”) no later than August 31, 2025. Preference will be given to Proposals that specify an earlier GCOD during the non-price evaluation.
- 1.2.13 A Proposer’s GCOD set forth in its Proposal will be the GCOD in any resulting PPA if such Proposal is selected to the Final Award Group. Proposers will not be able to request a change in the GCOD set forth in their Proposals.
- 1.2.14 The selected Proposer will be responsible for all Project costs throughout the term of the PPA, including but not limited to Project development, completion of an Interconnection Requirements Study (“IRS”), the cost of conducting a greenhouse gas analysis, land leasing, permitting, financing, construction of the Facility and all Interconnection Facilities, and the operations and maintenance (“O&M”) of the Facility.
- 1.2.15 The selected Proposer will be solely responsible for the decommissioning of the Project and the restoration of the Site upon the expiration of the PPA, as described in Attachment G, Section 7 of the RDG PPA.
- 1.2.16 The selected Proposer shall pursue all available applicable federal and state tax credits. Proposal pricing must be set to incorporate the benefit of such available federal tax credits. However, to mitigate the risk on Proposers due solely to potential changes to the state’s tax credit law before a selected project reaches commercial operations, Proposal pricing shall be set without including any state tax credits. If a Proposal is selected, the PPA for the project will require the Proposer to pursue the maximum available state tax

credit and remit tax credit proceeds to the Company for customers' benefit as described in Attachment J of the RDG PPA. The PPA will also provide that the Proposer will be responsible for payment of liquidated damages for failure to pursue the state tax credit.

1.3 Competitive Bidding Framework

Consistent with the Framework, this RFP outlines the Company's requirements in relation to the resources being solicited and the procedures for conducting the RFP process. It also includes information and instructions to prospective Proposers participating in and responding to this RFP.

1.4 Role of the Independent Observer

1.4.1 Part III.C.1 of the Framework sets forth the circumstances under which an Independent Observer is required in a competitive bidding process. The Independent Observer will advise and monitor all phases of the RFP process and will coordinate with PUC staff throughout the RFP process to ensure that the RFP is undertaken in a fair and unbiased manner. In particular, the Company will review and discuss with the Independent Observer decisions regarding the evaluation, disqualification, non-selection, and selection of Proposals.

1.4.2 The role of the Independent Observer, as described in the Framework, will include but is not limited to:

- Monitor all steps in the competitive bidding process
- Monitor communications (and communications protocols) with Proposers
- Monitor adherence to the Company's Code of Conduct
- Submit comments and recommendations, if any, to the PUC concerning the RFP
- Review the Company's Proposal evaluation methodology, models, criteria, and assumptions
- Review the Company's evaluation of Proposals
- Advise the Company on its decision-making
- Participate in dispute resolution as set forth in Section 1.10
- Monitor contract negotiations with Proposers
- Report to the PUC on monitoring results during each stage of the competitive bidding process
- Provide an overall assessment of whether the goals of the RFP were achieved
- Monitor the ongoing discussions between Maui Electric and Pūlama Lāna'i

1.4.3 The Independent Observers for this RFP is **Arroyo Seco Consulting**.

1.5 Communications Between the Company and Proposers – Code of Conduct Procedures Manual

1.5.1 Communications and other procedures under this RFP are governed by the "Code of Conduct Procedures Manual," (also referred to as the "Procedures Manual") developed by the Company as required by the Framework, and attached as Appendix C.

- 1.5.2 All pre-Proposal communication with prospective Proposers will be conducted via the Company's RFP website, Electronic Procurement Platform, and/or electronic mail ("Email") through the address specified in Section 1.6 (the "RFP Email Address"). Phone communication or face-to-face meetings will not be supported. Frequently asked questions submitted by prospective Proposers and the answers to those questions may be posted on the Company's RFP website. The Company reserves the right to respond only to comments and questions it deems are appropriate and relevant to the RFP. Proposers shall submit questions no later than fifteen Days before the Proposal Due Date (see RFP Schedule in Section 3.1, Items 6 and 7). The Company will endeavor to respond to all questions no later than five Days before the Proposal Due Date.
- 1.5.3 After Proposals have been submitted, the Company may contact individual Proposers for purposes of clarifying their Proposal(s).
- 1.5.4 Any confidential information deemed by the Company, in its sole discretion, to be appropriate to share, will only be transmitted to the requesting party after receipt of a fully executed Mutual Confidentiality and Non-Disclosure Agreement⁵ ("NDA") (see Appendix E).
- 1.5.5 Except as expressly permitted and in the manner prescribed in the Procedures Manual, any unsolicited contact by a Proposer or prospective Proposer with personnel of the Company pertaining to this RFP is prohibited.

1.6 Company Contact for Proposals

The primary contact for this RFP is:

Mery Apple
Energy Contract Manager
Hawaiian Electric Company, Inc.

RFP Email Address: cbrrfp@hawaiianelectric.com

1.7 Proposal Submission Requirements

- 1.7.1 All Proposals must be prepared and submitted in accordance with the procedures and format specified in the RFP. Proposers are required to respond to all questions and provide all information requested in the RFP, as applicable, and only via the communication methods specified in the RFP.
- 1.7.2 Detailed requirements regarding the form, submission, organization and information for the Proposal are set forth in Chapter 3 and Appendix B.
- 1.7.3 Proposals must not rely on any information that is not contained within the Proposal itself in demonstrating compliance for any requirement in this RFP.

⁵ See Section 3.12.1 of this RFP.

- 1.7.4 In submitting a Proposal in response to this RFP, each Proposer certifies that the Proposal has been submitted in good faith and without fraud or collusion with any other unaffiliated person or entity. The Proposer shall acknowledge this in the Response Package submitted with its Proposal. Furthermore, in executing the NDA provided as Appendix E, the Proposer agrees on behalf of its Representatives (as defined in the NDA) that the Company's negotiating positions will not be shared with other Proposers or their respective Representatives.

In addition, in submitting a Proposal, a Proposer will be required to provide Company with its legal counsel's written certification in the form attached as Appendix B Attachment 1 certifying in relevant part that irrespective of any Proposer's direction, waiver, or request to the contrary, that the attorney will not share a Proposer's confidential information associated with such Proposer with others, including, but not limited to, such information such as a Proposer's or Company's negotiating positions. If legal counsel represents multiple unaffiliated Proposers whose Proposals are selected for the Final Award Group, such counsel will also be required to submit a similar certification at the conclusion of power purchase agreement negotiations that he or she has not shared a Proposer's confidential information or the Company's confidential information associated with such Proposer with others, including but not limited to, such information as a Proposer's or Company's negotiating positions.

- 1.7.5 All proposals must be submitted via the Electronic Procurement Platform by 2:00 pm Hawai'i Standard Time ("HST") on the Proposal Due Date shown in the RFP Schedule in Section 3.1, Table 1, Item 9 and Item 10. No hard copies of these Proposals will be accepted by the Company.

It is the Proposer's sole responsibility to ensure that complete and accurate information has been submitted on time and consistent with the instructions of this RFP. With this assurance, Company shall be entitled to rely upon the completeness and accuracy of every Proposal. Any errors identified by the Proposer or Company after the Proposal Due Date has passed may jeopardize further consideration and success of the Proposal. If an error or errors are later identified, Company, in consultation with the Independent Observer, may permit the error(s) to be corrected without further revision to the Proposal, or may require Proposer to adhere to terms of the Proposal as submitted without correction. Additionally, and in Company's sole discretion, if such error(s) would materially affect the Final Award Group, Company reserves the right, in consultation with the Independent Observer, to remove or disqualify a Proposal upon discovery of the material error(s). The Proposer of such Proposal shall bear the full responsibility for such error(s) and shall have no recourse against Company's decision to address Proposal error(s), including removal or disqualification. The Energy Contract Manager, in consultation with the Independent Observer, will confirm that the Self-Build Proposal is submitted by the Self-Build Proposal Due Date in Section 3.1, Table 1, Item 9. The Electronic Procurement Platform automatically closes to further submissions after the IPP and Affiliate Proposal Due Date in Section 3.1, Table 1, Item 10.

1.8 Proposal Fee

- 1.8.1 IPP and Affiliate proposers are required to tender a non-refundable Proposal Fee of \$5,000 for each Proposal submitted.
- 1.8.2 The Proposal Fee must be in the form of a cashier's check or equivalent from a U.S.-chartered bank made payable to "Maui Electric Company, Ltd." and must be delivered and received by the Company by 2:00 pm HST on the Proposal Due Date shown in the RFP Schedule in [Section 3.1, Table 1, Item 10](#). The cashier's check should include a reference to the Proposal(s) for which the Proposal Fee is being provided. Proposers must identify in the Proposal Response Package (instructions in [Appendix B Section 1.3.1](#)) the delivery information for its Proposal Fee. Proposers are strongly encouraged to utilize a delivery service method that provides proof of delivery to validate delivery date and time.

If the Proposal Fee is delivered by U.S. Postal Service (with registered, certified, receipt verification), the Proposer shall address it to:

Mery Apple
Energy Contract Manager
Hawaiian Electric Company, Inc.
Mail Code CP21-IU
PO Box 2750
Honolulu, Hawai'i 96840

If the Proposal Fee is delivered by other courier services, the Proposer shall address it to:

Hawaiian Electric Company, Inc
Ward Receiving
Attention: Mery Apple, Energy Contract Manager
Mail Code CP21-IU
799 S. King St.
Honolulu, Hawai'i 96813

Due to COVID-19 disease prevention measures, Proposal Fees cannot be delivered in person.

1.9 Procedures for the Self-Build or Affiliate Proposals

- 1.9.1 Order No. 37070 states that the CBRE RFPs will be open to all bidders, including the Company. The Competitive Bidding Framework allows the Company the option to offer a Proposal(s) in response to this RFP ("Self-Build Option" or "SBO"). Accordingly, the Company must follow certain requirements and procedures designed to safeguard against and address concerns associated with: (1) preferential treatment of the SBO or members, agents, or consultants of the Company formulating the SBO (the "Self-Build Team"); and (2) preferential access to proprietary information by the Self-Build Team. These requirements are specified in the Code of Conduct ("CBRE Code of Conduct") required

under the Framework and implemented by certain rules and procedures found in the Procedures Manual submitted to the PUC in Docket No. 2015-0389 on July 9, 2020. The CBRE Code of Conduct will apply to all CBRE Phase 2 RFPs, regardless of whether the Company will submit an SBO Proposal. A copy of the Procedures Manual is attached as Appendix C.

The Competitive Bidding Framework also allows Affiliates of the Company to submit Proposals⁶ to RFPs issued by the Company. All Self-Build and Affiliate Proposals are subject to the Company's Code of Conduct and the Procedures Manual. Affiliate Proposals are also subject to any applicable Affiliate Transaction Requirements issued by the PUC in Decision and Order No. 35962 on December 19, 2018, and subsequently modified by Order No. 36112, issued on January 24, 2019, in Docket No. 2018-0065. Affiliate Proposals will be treated identically to an IPP Proposal and must be submitted electronically through the Electronic Procurement Platform by the IPP and Affiliate Proposal Due Date in RFP Table 1, Item 10.

- 1.9.2 The Company will require that the Proposal for the SBO(s) and Affiliate Proposals be submitted electronically through the Electronic Procurement Platform. SBO Proposals will be due a minimum of one (1) Day before other Proposals are due. A Proposal for the SBO will be uploaded into the Electronic Procurement Platform in the same manner Proposals from other Proposers are uploaded. The Energy Contract Manager, in consultation with the Independent Observer, will confirm that the Self-Build Proposals are timestamped the Self-Build Proposal Due Date found in RFP Section 3.1, Table 1, Item 9.
- 1.9.3 Detailed requirements for an SBO Proposal can be found in Appendix G. These requirements are intended to provide a level playing field between SBO Proposals and third-party Proposals. Except where specifically noted, an SBO Proposal must adhere to the same price and non-price Proposal requirements as required of all Proposers, as well as certain RDG PPA requirements, such as milestones and liquidated damages, as described in Appendix G. The non-negotiability of the Performance Standards shall apply to any SBO to the same extent it would for any other Proposal. Notwithstanding the fact that it will not be required to enter into an RDG PPA with the Company, a Self-Build Proposer will be required to note its exceptions, if any, to the RDG PPA in the same manner required of other Proposers, and will be held to such modified parameters if selected. In addition to its Proposal, the Self-Build Team will be required to submit Appendix G Attachment 1, Self-Build Option Team Certification Form, acknowledging it has followed the rules and requirements of the RFP to the best of its ability and has not engaged in any collusive actions or received any preferential treatment or information providing an impermissible competitive advantage to the Self-Build Team over other Proposers responding to this RFP, as well as adherence to PPA terms and milestones required of all Proposers and the SBO's proposed cost protection measures.

The cost recovery methods between a regulated utility SBO Proposal and IPP Proposals are fundamentally different due to the business environments they operate in. As a result,

⁶ A Proposal will also be treated as an Affiliate Proposal if the Affiliate is a partner for the Proposal.

the Company has instituted a process to compare the two types of proposals for the evaluation of the price related criteria on a ‘like’ basis through comparative analysis.

At the core of an SBO Proposal are its total project capital cost and any associated annual operations and maintenance (“O&M”) costs. During the RFP’s pricing evaluation step, these capital costs⁷ and O&M costs will be used in a revenue requirement calculation to determine the estimated revenues needed from customers which would allow the Company to recover the total cost of the project. The SBO revenue requirements are then used in a levelized benefits calculation to determine a Levelized Benefit (“LB”) (\$/MWh) which will then be used for comparison to IPP and any Affiliate Proposals.

The Company, in conjunction with the Independent Observer, may also conduct a risk assessment of the SBO Proposal to ensure an appropriate level of customer cost protection measures are included in such Proposal.

If the SBO is not included in any shared savings mechanism for this RFP pre-approved by the Commission, the SBO will be permitted to submit a shared savings mechanism with its Proposal to share in any cost savings between the amount of cost bid in the SBO Proposal and the actual cost to construct the Project. If the SBO Proposal is selected to the Final Award Group, the proposed shared savings mechanism will need to be approved by the PUC. Submission of a shared savings mechanism is not required and will not be considered in the evaluation of the SBO Proposal.

1.10 Dispute Resolution Process

- 1.10.1 If disputes arise under the RFP, the provisions of Section 1.10 and the dispute resolution process established in the Framework will control (see Part V of the Framework).
- 1.10.2 Proposers who challenge or contest any aspect of the RFP process must first attempt to resolve their concerns with the Company and the Independent Observer (“Initial Meeting”). The Independent Observer will seek to work cooperatively with the parties to resolve any disputes or pending issues and may offer to mediate the Initial Meeting to resolve disputes prior to such issues being presented to the PUC.
- 1.10.3 Any and all disputes arising out of or relating to the RFP which remain unresolved for a period of twenty (20) Days after the Initial Meeting takes place may, upon the agreement of the Proposer and the Company, be submitted to confidential mediation in Honolulu, Hawai‘i, pursuant to and in accordance with the Mediation Rules, Procedures, and Protocols of Dispute Prevention Resolution, Inc. (“DPR”) (or its successor) or, in its absence, the American Arbitration Association then in effect (“Mediation”). The Mediation will be administered by DPR. If the parties agree to submit the dispute to Mediation, the Proposer and the Company shall each pay fifty percent (50%) of the cost of the Mediation (i.e., the fees and expenses charged by the mediator and DPR) and shall otherwise each bear their own Mediation costs and attorneys’ fees.

⁷ SBO Proposals will be required to provide a table identifying project costs by year. These capital costs should be all inclusive, including but not limited to costs associated with equipment, Engineering, Procurement, and Construction (“EPC”), interconnection, overhead, and Allowance for Funds Used During Construction (“AFUDC”).

- 1.10.4 If settlement of the dispute is not reached within sixty (60) Days after commencement of the Mediation, or if after the Initial Meeting, the parties do not agree to submit any unresolved disputes to Mediation, then as provided in the Framework, the Proposer may submit the dispute to the PUC in accordance with the Framework.
- 1.10.5 In accordance with the Framework, the PUC will serve as the arbiter of last resort for any disputes relating to this RFP involving Proposers. The PUC will use an informal expedited dispute resolution process to resolve the dispute within thirty (30) Days, as described in Parts III.B.8 and V of the Framework.⁸ There will be no right to hearing or appeal from this informal expedited dispute resolution process.
- 1.10.6 If any Proposer initiates a dispute resolution process for any dispute or claim arising under or relating to this RFP, other than that permitted by the Framework and this Section 1.10 of this RFP (e.g., a court proceeding), then such Proposer shall be responsible for any and all attorneys' fees and costs that may be incurred by the Company or the PUC in order to resolve such claim.

1.11 No Protest or Appeal

Subject to Section 1.10, no Proposer or other person will have the right to protest or appeal any award or disqualification of a Project made by the Company.

By submitting a Proposal in response to the RFP, the Proposer expressly agrees to the terms and conditions set forth in this RFP.

1.12 Modification or Cancellation of the Solicitation Process

- 1.12.1 Unless otherwise expressly prohibited, the Company may, at any time up to the final execution of an RDG PPA, as may be applicable, in consultation with the Independent Observer, postpone, withdraw, and/or cancel any requirement, term, or condition of this RFP, including deferral of the award or negotiation of any contract, and/or cancellation of the award all together, all of which will be without any liability to the Company.
- 1.12.2 The Company may modify this RFP subject to requirements of the Framework, whereby the modified RFP will be reviewed by the Independent Observer and submitted to the PUC thirty (30) Days prior to its issuance, unless the PUC directs otherwise. See Framework Part IV.B.10. The Company will follow the same procedure with regard to any potential postponement, withdrawal, or cancellation of the RFP or any portion thereof.

⁸ The informal expedited dispute resolution process does not apply to PUC review of contracts that result from the RFP. See Decision and Order No. 23121 at 34-35. Further, the informal expedited dispute resolution process does not apply to the Framework's process relating to issuance of a draft and final RFP, and/or to the PUC approval of the RFP because: (1) the Framework (and the RFP) set forth specific processes whereby interested parties may provide input through the submission of comments; and (2) the Framework's dispute resolution process applies to "Bidders" and there are no "Bidders" at this stage in the RFP process.

1.13 Community Outreach

The Company held a community meeting on Lāna‘i to explain the RFP process and the Company’s intent to procure a PV with storage project on the island of Lāna‘i. At the community meeting, the Company solicited feedback from the community of Lāna‘i regarding the RFP process and planned procurement. The Company has provided the comments received at the meeting in Appendix K. Proposers are encouraged to review such comments and take such comments into account when developing Proposals in response to this RFP.

Chapter 2: Resource Needs and Requirements

2.1 Performance Standards

Proposals must meet the attributes set forth in this RFP and the requirements of the RDG PPA. This RFP and the RDG PPA set forth the minimum requirements that all Proposals must satisfy to be eligible for consideration in this RFP. Additional Performance Standards may be required based on the results of the IRS.

Facilities must be able to operate in grid-forming mode as defined in the RDG PPA. The ability to startup without requiring energy from the grid (black start capability⁹) is required including energization of the interconnection transformers. The facility may be also utilized as the cranking path for island system restoration, based upon energy availability and storage state of charge.

The functionality and characteristics of the storage must be maintained throughout the term of the PPA. To be clear, Proposers may not propose any degradation for either capacity or efficiency in their Proposals.

2.2 Distribution-Level System Information

The Company has performed a preliminary evaluation of the Distribution System which indicates that a PV project of the requested size is able to be supported at the Miki Basin switchyard. A detailed IRS will be required to assess whether additional system mitigation measures will be required to integrate any specific project selected through this RFP. Per Section 3.11 and Appendix F, projects must interconnect to the Miki Basin switchyard. The estimated configuration of the interconnection is provided in Appendix H. Any questions regarding the interconnection may be directed to the RFP Email Address in Section 1.6.

⁹ The ability to start itself and provide power to the Company's grid without relying on any services or energy from the Company's grid in order to assist the grid in recovering from a total or partial shutdown. During such a total or partial shutdown of the grid, the Project may experience step changes in load and other transient and dynamic conditions as it picks up load without support from other resources on the grid during start-up (if the Project remains connected) or while connecting to the loads the Project is picking up (not the start-up and connecting of the Facility itself).

2.3 Interconnection to the Company System

The Proposer must provide information pertaining to the design, development, and construction of the Interconnection Facilities. Interconnection Facilities include both: (1) Seller-Owned Interconnection Facilities; and (2) Company-Owned Interconnection Facilities.

- 2.3.1 All Proposals must include a description and conceptual or schematic diagrams of the Proposer's plan to transmit power from the Facility to the Company System. The proposed Interconnection Facilities must be compatible with the Company System. In the design, Projects must adequately consider Company requirements to address impacts on the performance and reliability of the Company System.
- 2.3.1.1 In addition to the Performance Standards and findings of the IRS, the design of the Interconnection Facilities, including power rating, Point(s) of Interconnection ("POI") with the Company System, and scheme of interconnection, must meet Company standards. The Company will provide its construction standards and procedures to the Proposer (Engineer, Procure, Construct Specifications for Hawaiian Electric Power Lines and Substations) if requested via the communication methods identified in Section 1.5 and upon the execution of an NDA as specified in Section 3.12.1. These specifications are intended to illustrate the scope of work typically required to administer and perform the design and construction of a Maui Electric substation and power line.
- 2.3.1.2 Interconnection Facilities must be designed such that it meets or exceeds the applicable single line diagram in Appendix H.
- 2.3.1.3 Tariff Rule No. 19 establishes provisions for Interconnection and Transmission Upgrades and can be found at <https://www.hawaiianelectric.com/billing-and-payment/rates-and-regulations/>. While the Lānaʻi System does not have a traditional Transmission System, the tariff provisions are intended to simplify the rules regarding who pays for, installs, owns, and operates interconnection facilities in the context of competitive bidding. The Company will be responsible for building all Company-Owned Interconnection Facilities for a selected Project.
- 2.3.2 The Proposer shall be responsible for all costs required to interconnect a Project to the Company System, including but not limited to any work in the Company's existing energized facilities, the final tap, and all Seller-Owned Interconnection Facilities and Company-Owned Interconnection Facilities.
- 2.3.3 Proposers are required to include in their pricing proposal all costs for interconnection and distribution equipment expected to be required between their Facility and their proposed Point of Interconnection. Appendix H includes some information related to Company-Owned Interconnection Facilities and costs that may be helpful to Proposers. The selected Proposer shall be responsible for the actual final costs of all Seller-Owned Interconnection Facilities and Company-Owned Interconnection Facilities (see Appendix H), whether or not such costs exceed the costs set forth in a Proposer's Proposal. No

adjustments will be allowed to the proposed price in a Proposal if actual costs for Interconnection Facilities exceed the amounts proposed.

- 2.3.4 Proposers are required to account for all costs for distribution-level service interconnection for station power in their pricing proposal.
- 2.3.5 All Projects will be screened for general readiness to comply with the requirements for interconnection. The selected Proposal will be subject to further study in the form of an IRS. The IRS process is further described in Section 5.1. The results of the completed IRS, as well as any mitigation measures identified, will be incorporated into the terms and conditions of a final executed RDG PPA.

Chapter 3: Instructions to Proposers

3.1 Schedule for the Proposal Process

Table 1 sets forth the proposed schedule for the proposal process (the “RFP Schedule”). The RFP Schedule is subject to PUC approval. The Company reserves the right to revise the RFP Schedule as necessary. Changes to the RFP Schedule prior to the RFP Proposal Due Date will be posted to the RFP website. Changes to the RFP Schedule after the Proposal Due Date will be communicated via email to the Proposers and posted on the RFP Website.

**Table 1
RFP Schedule**

Milestone	Schedule Dates
(1) Draft RFP filed	July 9, 2020
(2) Technical Status Conference	July 29, 2020
(3) Parties and Participants file Comments by	August 12, 2020
(4) Proposed Final RFP filed	September 8, 2020
(5) Updated RFP Draft filed Per Order 37592	March 30, 2021
(6) Parties and Participants file Comments by	April 14, 2021
(7) Proposed Updated RFP filed	May 14, 2021 ¹⁰
(8) Final RFP is Issued	June 14, 2021 ¹¹
(9) Self-Build Proposal Due Date	August 12, 2021 at 2:00 pm HST
(10) IPP and Affiliate Proposal Due Date	August 13, 2021 at 2:00 pm HST
(11) Selection of Final Award Group	October 12, 2021
(12) Contract Negotiations Start	October 19, 2021

¹⁰ This date and all subsequent dates in the proposed schedule are dependent on any further guidance provided by the PUC.

¹¹ Per Section IV.B.6.e.ii of the Competitive Bidding Framework “[t]he utility shall have the right to issue the RFP if the Commission does not direct the utility to do otherwise within thirty (30) days after the Commission receives the proposed RFP and the Independent Observer's comments and recommendations.” June 14, 2021 is an offered issue date that provides the Commission at least thirty (30) days to review the Proposed Updated RFP. .

3.2 Company RFP Website/Electronic Procurement Platform

The Company has established a website for general information to share with potential Proposers. The RFP website is located at the following link:

www.hawaiianelectric.com/competitivebidding

The Company will provide general notices, updates, schedules and other information on the RFP website throughout the process. Proposers should check the website frequently to stay abreast of any new developments. This website will also contain the link to the Electronic Procurement Platform employed by the Company for the receipt of Proposals.

“Sourcing Intelligence” developed by Power Advocate is the Electronic Procurement Platform that the Company has licensed and will utilize for the receipt of Proposals in this RFP. Proposers who do not already have an existing account with PowerAdvocate and who intend to submit a Proposal for this RFP will need to register as a “Supplier” with PowerAdvocate.

- 3.2.1 There are no license fees, costs, or usage fees to Proposers for the use of the Electronic Procurement Platform.

See Appendix D for user information on and screenshots of PowerAdvocate’s Sourcing Intelligence procurement platform.

3.3 Information Exchange

The PUC conducted a Technical Status Conference on July 29, 2020 to discuss this draft RFP. Parties and Participants had the opportunity to submit comments on the draft RFP. The Company then revised the RFP after considering comments received and filed a final RFP for PUC review and approval. Subsequently, the PUC issued Order No. 37592 which among other things, directed the Companies to further collaborate with the Parties and Participants. As a result, the Company held several meetings with the Parties and Participants, which helped inform further updates to the RFP that were reflected in the Company’s submittal of an updated RFP to the PUC.

Additionally, the Company will hold a prerecorded webinar for CBRE in accordance with the Competitive Bidding Framework for prospective Proposers to learn about the provisions and requirements of this RFP. This prerecorded webinar will be posted to the Company’s website within one week of the issuance of the final RFP.

Prospective Proposers may also submit written questions regarding the RFP to the RFP Email Address set forth in Section 1.6. The Company will endeavor to address all questions that will be helpful to prospective Proposers via a Q&A section on the RFP website.

Prospective Proposers should review the RFP Website’s Q&A section prior to submission of their Proposal. Duplicate questions will not be answered.

3.4 Preparation of Proposals

- 3.4.1 Each Proposer shall be solely responsible for reviewing the RFP (including all attachments and links) and for thoroughly investigating and informing itself with respect to all matters pertinent to this RFP, the Proposer's Proposal, and the Proposer's anticipated performance under the RDG PPA. It is the Proposer's responsibility to ensure it understands all requirements of the RFP, to seek clarification if the RFP's requirements or Company's request is not clear, and to ask for any confirmation of receipt of submission of information. Under Section 1.7.5, the Proposer is solely responsible for all errors in its Proposal(s). The Company will not accept any assertion by a Proposer that it was incumbent on the Company to catch any error.
- 3.4.2 Proposers shall rely only on official information provided by the Company in this RFP when preparing their Proposal. The Company will rely only on the information included in the Proposals and additional information solicited by the Company to Proposers in the format requested, to evaluate the Proposals received. Evaluation will be based on the stated information in this RFP and on information submitted by Proposers in response to this RFP. Proposals must clearly state all capabilities, functionality and characteristics of the Project; must clearly detail plans to be performed; must explain applicability of information; and must provide all referenced material if it is to be considered during the Proposal evaluation. Referencing previous RFP submissions or projects for support will not be considered. Proposers should not assume that any previous RFP decisions or preferences also apply to this RFP.
- 3.4.3 Each Proposer shall be solely responsible for, and shall bear all of its costs incurred in the preparation of its Proposal and/or its participation in this RFP, including, but not limited to, all costs incurred with respect to the following: (1) review of the RFP documents; (2) status conference participation; (3) site visits; (4) third-party consultant consultation; and (5) investigation and research relating to its Proposal and this RFP. The Company will not reimburse any Proposer for any such costs, including the selected Proposer.
- 3.4.4 Each Proposal must contain the full name and business address of the Proposer and must be signed by an authorized officer or agent¹² of the Proposer.

3.5 Organization of the Proposal

- 3.5.1 The Proposal must be organized as specified in Appendix B. It is the Proposer's responsibility to ensure the information requested in this RFP is submitted and contained within the defined Proposal sections as specified in Appendix B.

3.6 Proposal Limitations

Proposers expressly acknowledge that Proposals are submitted subject to the following limitations:

¹² Proposer's officer or agent must be authorized to sign the Proposal. Such authorization must be in writing and may be granted via Proposer's organizational documents (i.e., Articles of Incorporation, Articles of Organization, By-laws, etc.), resolution, or similar documentation.

The RFP does not commit or require the Company to award a contract, pay any costs incurred by a Proposer in the preparation of a Proposal, or procure or contract for products or services of any kind whatsoever. The Company reserves the right, in consultation with the Independent Observer, to accept or reject, in whole or in part, any or all Proposals submitted in response to this RFP, to negotiate with any or all Proposers eligible to be selected for award, or to withdraw or modify this RFP in whole or in part at any time.

- The Company reserves the right, in consultation with the Independent Observer, to request additional information from any or all Proposers relating to their Proposals or to request that Proposers clarify the contents of their Proposals. Proposers who are not responsive to such information requests may be eliminated from further consideration upon consultation with the Independent Observer.
- The Company reserves the right, in consultation with the Independent Observer, to solicit additional Proposals from Proposers after reviewing the initial Proposals. Other than as provided in this RFP, no Proposer will be allowed to alter its Proposal or add new information to a Proposal after the Proposal Due Date.
- All material submitted in response to this RFP will become the sole property of the Company, subject to the terms of the NDA.

3.7 Proposal Compliance and Bases for Disqualification

Proposers may be deemed non-responsive and/or Proposals may not be considered for reasons including, but not limited to, the following:

- Any unsolicited contact by a Proposer or prospective Proposer with personnel of the Company pertaining to this RFP as described in Section 1.5.5.
- Any illegal or undue attempts by or on behalf of the Proposer or others to influence the Proposal Review process.
- The Proposal does not meet one or more of the Eligibility Requirements specified in Section 4.2.
- The Proposal does not meet one or more of the Threshold Requirements specified in Section 4.3.
- The Proposal is deemed to be unacceptable through a fatal flaws analysis as described in Section 4.4.2.
- The Proposer does not respond to a Company request for additional information to clarify the contents of its Proposal within the timelines specified by the Company.

- The Proposal contains misrepresentations or errors.

3.8 Power Purchase Agreement

- 3.8.1 The Power Purchase Agreement for proposals selected under this RFP will be in the form of the RDG PPA, attached as Appendix L.
- 3.8.2 If selected, any Affiliate Proposer will be required to enter into the RDG PPA with the Company.
- 3.8.3 If selected, a Self-Build Proposer will not be required to enter into a PPA with the Company. However, the Self-Build Proposer will be held to the proposed modifications to the RDG PPA, if any, it submits as part of the SBO in accordance with Section 3.8.5. Moreover, the SBO will be held to the same performance metrics and milestones set forth in the RDG PPA to the same extent as all Proposers, as attested to in the SBO's Appendix G, Attachment 1, Self-Build Option Certification submittal. If liquidated damages are assessed, they will be paid from shareholder funds and returned to customers through the Purchased Power Adjustment Clause ("PPAC") or other appropriate rate adjustment mechanisms.

To retain the benefits of operational flexibility of a Company-owned facility, the SBO Proposal will be permitted to adjust operational requirements and performance metrics with the approval of the PUC. The process for adjustment would be similar to a negotiated amendment to a PPA with PUC approval.

- 3.8.4 In general, under the RDG PPA, payment to the Seller consists of a Lump Sum Payment component to cover the costs of the Project. In return, the Seller shall guarantee minimum performance and availability metrics to ensure that the Facility is maintained and available for energy storage and dispatch, as well as provide an indication of the available energy in near real-time for the Company's dispatch. Company shall not be obligated to accept, nor shall it be required to pay for, test energy generated by the Facility during acceptance testing or other test conditions.
- 3.8.5 The Performance Standards identified in Section 2.1 in the RDG PPA establish the minimum requirements a Proposal must satisfy to be eligible for consideration in this RFP. A proposed Facility's ability to meet these Performance Standards is both a Threshold Requirement and a Non-Price Related Criteria under Sections 4.3 and 4.4.2, respectively. As such, these Performance Standards included in the RDG PPA are non-negotiable. Proposers may propose modifications to other sections of the RDG PPA but are encouraged to accept such terms as written in order to expedite the overall RFP process and potential contract negotiations. As a component of their Proposals, Proposers who elect to propose modifications shall provide a Microsoft Word red-line version of the relevant document identifying specific proposed modifications to the model language that the Proposer is agreeable to, as well as a detailed explanation and supporting rationale for each modification.

- 3.8.5.1 General comments, drafting notes and footnotes such as “parties to discuss”, and reservation of rights to propose modifications at a later time are unacceptable and will be considered non-responsive. Proposed modifications to the RDG PPA shall be limited to targeted revisions to, and not deletions or waivers of, the agreement’s terms, conditions, covenants, requirements or representations. Proposed modifications will also be evaluated as a non-price evaluation criterion as further described in Section 4.4.2. In order to facilitate this process, the Company will make available an electronic version of the model agreement on the RFP website and through the Electronic Procurement Platform for the RFP. Any proposed modifications to the RDG PPA will be subject to negotiation between the Company and the Final Award Group and should not be assumed to have been accepted either as a result of being selected to the Final Award Group or based on any previously executed PPA. As stated above, since general comments, drafting notes, and footnotes without accompanying specific proposed language modifications are unacceptable and non-responsive, the Company will not negotiate provisions simply marked by such general comments, drafting notes, and footnotes.
- 3.8.5.2 The Company has an interest in maintaining consistency for certain provisions of the RDG PPAs, such as the calculation of availability and payment terms. Therefore, for such provisions, the Company will endeavor to negotiate similar and consistent language across PPAs for the Final Award Group.
- 3.8.6 Proposals that do not include specific proposed modifications to the attached RDG PPA will be deemed to have accepted the RDG PPA in its entirety.

3.9 Pricing Requirements

- 3.9.1 Proposers are responsible for understanding the terms of the RDG PPA. Pricing cannot be specified as contingent upon other factors (e.g., changes to federal tax policy or receiving all Investment Tax Credits assumed).
- 3.9.2 Escalation in pricing over the term of the RDG PPA is prohibited.
- 3.9.3 Pricing information must only be identified within specified sections of the Proposal as instructed by this RFP’s Appendix B Proposer’s Response Package (i.e., Proposal pricing information must be contained within defined Proposal sections of the Proposal submission). Pricing information contained anywhere else in a Proposal will not be considered during the evaluation process.
- 3.9.4 The Proposer’s Response Package must include the following prices for each Proposal:

For IPP or Affiliate proposals:

- **Lump Sum Payment (\$/year):** Payment amount for full dispatchability of the Facility. Payment will be made in monthly increments.

For the Self-Build Proposal:

- **Total Project Capital Costs (\$/year):** Total capital costs for the project (identified by year).
- **Annual O&M Costs (\$/year):** Initial year operations and maintenance costs, annual escalation rate.
- **Annual Revenue Requirement (\$/year):** Annual revenue requirements (ARR) calculated for each year.

Additional description and detail on the Total Project Capital Costs, Annual O&M Costs, and Annual Revenue Requirement for the SBO Proposal is located in Appendix G.

3.9.5 As identified in the Schedule of Defined Terms in the PPA under “BESS Allocated Portion of the Lump Sum Payment”, the allocated portion of the Lump Sum Payment specified for energy storage for the Facility is 50% and shall be a non-negotiable percentage in the PPA.

3.10 Project Description

3.10.1 Proposals are required to provide a Net Energy Potential (“NEP”) RFP Projection for the Project. The NEP RFP Projection associated with the proposed Project represents the estimated annual net energy (in MWh) that could be produced by the Facility and delivered to the Point of Interconnection over a ten-year period with a probability of exceedance of 95%. The energy generated by the Facility in excess of Company dispatch but below the Facility’s Allowed Capacity that is stored in the Facility’s BESS component and can later be discharged to the POI considering the BESS Contract Capacity and Maximum Rated Output should be included in the NEP RFP Projection. Any energy in excess of what is allowed to be delivered to the POI and would exceed the BESS Contract Capacity shall be excluded from the Net Energy Potential. Any energy generated outside of the proposed Facility that is used to charge the BESS component should not be factored into the NEP RFP Projection. Any losses that may be incurred from energy being stored and then discharged from the energy storage (round trip efficiency losses) should be excluded from the NEP RFP Projection, but the NEP should consider auxiliary loads in developing the value relative to the POI. The NEP RFP Projection will be used in the RFP evaluation process and therefore Proposers will be held to their provided value.¹³

3.10.2 Proposals are required to provide a single value Round Trip Efficiency (“RTE”), measured at the Point of Interconnection, that the Facility’s BESS component is required to maintain throughout the term of the PPA. This RTE value will be used in the RFP

¹³ If a PPA is executed between the Company and the selected Proposer, the NEP RFP Projection will be further evaluated at several steps throughout the process as set forth in the RDG PPA, and adjustments to the Lump Sum Payment will be made accordingly. Additionally, because the Company will rely on an accurate representation of the NEP RFP Projection in the RFP evaluation, a one-time liquidated damage as described in the RDG PPA will be assessed if the First NEP benchmark is less than the Proposer’s NEP RFP Projection. After the Facility has achieved commercial operations, the performance of the Facility will be assessed on a continuing basis against key metrics identified in the RDG PPA. See Article 2 and Attachment U of the RDG PPA.

evaluation process and therefore Proposers will be held to this provided value as it will become the RTE Performance Metric in Section 2.10 of the RDG PPA. Please review the RDG PPA for potential liquidated damages assessed against the Seller if the BESS does not maintain the required RTE. The RTE is further specified in Appendix B Section 2.

- 3.10.3 Each Proposer must also agree to provide Project financial information, including proposed Project finance structure information specified in Appendix B. Such information will be used to evaluate Threshold Requirements and non-price criteria (e.g., Financial Viability of Proposer, Financial Strength and Financing Plan, State of Project Development and Schedule) set forth in Sections 4.3 and 4.4.2. Upon selection, the Final Award Group may be requested to provide further detailed cost information if requested by the PUC or the Consumer Advocate as part of the PPA approval process. If requested, such information would be provided to the PUC, Consumer Advocate, and Company pursuant to a protective order in the docket.
- 3.10.4 The Proposer agrees that no material changes or additions to the Facility from what is submitted in its Proposal will be made without the Proposer first having obtained prior written consent from the Company. Evaluation of all Proposals in this RFP is based on the information submitted in each Proposal at the Proposal Due Date. If any Proposer requests that any Proposal information be changed after that date, the Company, in consultation with the Independent Observer, and in consideration of whether the evaluation is affected, will determine whether the change is permitted.

3.11 Project Site

All proposals must be sited on a pre-determined Project Site owned by Pūlama Lāna‘i, referred to as the Pūlama Site.¹⁴ The available area is approximately seventy-three (73) acres and is located adjacent to Miki Road and Miki Basin Plant, less than one (1) mile from the airport.

The selected Proposer will be required to execute a lease for the Pūlama Site coterminous with the term of the PPA with the landowner. A draft copy of the proposed form of lease and lease term sheet are included as Attachment 2 and Attachment 3, respectively, to Appendix F. The terms of the lease will be negotiable with the landowner. Additional information regarding the site, including a link to an Environmental Assessment and associated studies can also be found in Appendix F.

Due to COVID-19 travel restrictions, a site visit will not be available at this time. The Company will endeavor to provide as much information as possible to interested potential Proposers. Additional site information, beyond the details included in Appendix F, may be provided by the Company. Information on how to request such additional information, if available, will be posted on the Company’s website.

¹⁴ The location and acreage of the Pūlama Site in this RFP is different from the Pūlama Site identified in the RFP for Variable Renewable Dispatchable Generation Paired with Energy Storage, Island of Lāna‘i, dated November 27, 2019 and revised March 10, 2020.

3.12 Confidentiality

- 3.12.1 Each prospective Proposer must submit an executed NDA in the form attached as Appendix E by the Proposal Due Date specified in the RFP Schedule in Section 3.1. If a Proposer had previously executed an NDA for the Request for Proposal for Variable Renewable Dispatchable Generation Paired with Energy Storage, Island of Lāna‘i, dated November 29, 2019, that executed NDA will be accepted. The form of the NDA is not negotiable. Information designated as confidential by the Company will be provided on a limited basis, and only those prospective Proposers who have submitted an executed NDA will be considered. Proposers must clearly identify all confidential information in their Proposals. However, Proposers should designate as confidential only those portions of their Proposals that genuinely warrant confidential treatment. The Company discourages the practice of marking every page of a Proposal as confidential. The Company will make reasonable efforts to protect any such information that is clearly marked as confidential. Consistent with the terms of the NDA, the Company reserves the right to share any information, even if marked confidential, with its agents, contractors, or the Independent Observer for the purpose of evaluating the Proposal and facilitating potential contract negotiations.
- 3.12.2 Proposers, in submitting any Proposal to Company in response to this RFP, certify that such Proposer has not shared its Proposal, or any part thereof, with any other Proposer of a Proposal responsive to this RFP.
- 3.12.3 The Company will request that the PUC issue a Protective Order to protect confidential information provided by Proposers to the Company and to be filed in a proceeding before the PUC. A copy of the Protective Order, once issued by the PUC, will be provided to Proposers. Proposers should be aware that the Company may be required to share certain confidential information contained in Proposals with the PUC, the State of Hawai‘i Department of Commerce and Consumer Affairs, Division of Consumer Advocacy , and the parties to any docket instituted by the PUC, provided that recipients of confidential information have first agreed in writing to abide by the terms of the Protective Order. Notwithstanding the foregoing, no Proposer will be provided with Proposals from any other Proposer, nor will Proposers be provided with any other information contained in such Proposals or provided by or with respect to any other Proposer.

3.13 Credit Requirements Under the PPA

- 3.13.1 The Proposer with whom the Company enters into a PPA must post Development Period Security and Operating Period Security in the form of an irrevocable standby letter of credit from a bank chartered in the United States as required and set forth in Article 14 of the RDG PPA. Cash, a parent guaranty, or other forms of security will not be accepted in lieu of the irrevocable standby letter of credit.
- 3.13.2 The Development Period Security and Operating Period Security identified in the RDG PPA are minimum requirements. Proposers shall not propose an amount lower than that set forth in the RDG PPA.

- 3.13.3 Each Proposer shall be required to provide a satisfactory irrevocable standby letter of credit in favor of the Company from a bank chartered in the United States to guarantee Proposer's payment of interconnection costs for all Company-Owned Interconnection Facilities in excess of the Total Estimated Interconnection Costs and/or all relocation costs in excess of Total Estimated Relocation Costs that are payable to Company as required and set forth in Attachment G to the RDG PPA.
- 3.13.4 Proposers may be required to provide an irrevocable standby letter of credit in favor of the Company from a bank chartered in the United States in lieu of the required Source Code Escrow in an amount and as required and set forth in Attachment B to the RDG PPA.

Chapter 4: Evaluation Process and Evaluation Criteria

4.1 Proposal Evaluation and Selection Process

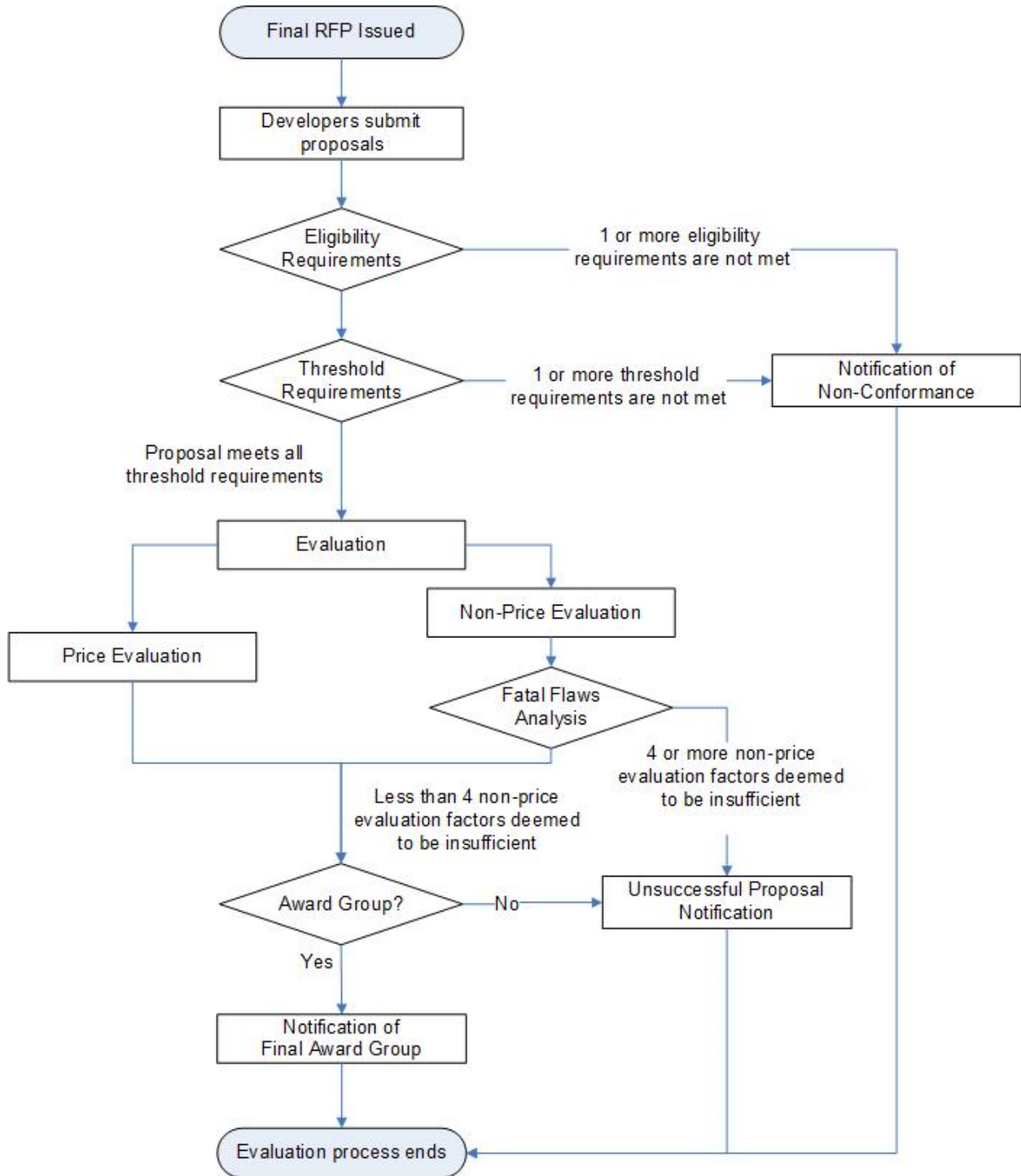
The Company will employ a multi-step evaluation process. This Chapter provides a description of each step of the process, along with the requirements of Proposers at each step. Figure 1 sets forth the flowchart for the proposal evaluation and selection process.

Upon receipt of the Proposals, the Company will review each Proposal submission to determine if it meets the Eligibility Requirements and the Threshold Requirements. The Company, in coordination with the Independent Observer will determine if a Proposer is allowed to cure any aspect of its Proposal or whether the Proposal will be eliminated based on failure to meet either Eligibility or Threshold Requirements.¹⁵ If a Proposer is provided the opportunity to cure any aspect of its Proposal, the Proposer shall be given three (3) business days to cure from the date of notification to cure¹⁶. Proposals that have successfully met the Eligibility and Threshold Requirements will then enter a price and non-price evaluation process, ultimately ending in a Proposal being selected to the Final Award Group.

¹⁵ As a general rule, if a Proposer does not include a requested document, inadvertently excludes minor information or provides inconsistencies in its information, it may be given a chance to cure such deficiency. If a Proposer fails to provide material required information in its Proposal and providing the Proposer an opportunity to cure is deemed by the Company, in consultation with the Independent Observer, as an unfair advantage to such Proposer, the Proposal could be classified as non-conforming and eliminated for failure to meet Eligibility Requirements.

¹⁶ The initial request will be offered 3 business days to cure. Succeeding inquiries on the deficiencies will be offered cure periods deemed sufficient by the Company and Independent Observer.

Figure 1 – Evaluation Workflow



4.2 Eligibility Requirements Assessment

Upon receipt of the Proposals, each Proposal will be reviewed to ensure that it meets the following Eligibility Requirements.

- The Proposer is not eligible to participate in this RFP if the Proposer, its parent company, or an affiliate of the Proposer has:
 - defaulted on a current contract with the Company, or
 - had a contract terminated by the Company, or
 - any pending litigation in which the Proposer has made claims against the Company.
- The Proposal, including required uploaded files, must be received on time via the Electronic Procurement Platform.
- The Proposal Fee must be received on time on or before the Proposal Due Date.¹⁷
- The Proposal must not contain material omissions.
- The Proposal must be signed and certified by an officer or other authorized agent of the Proposer.
- The Proposer must fully execute the NDA and any other documents required pursuant to this RFP.
- The Proposer must provide a Certificate of Vendor Compliance from the Hawai'i Compliance Express dated issued within 60 days of the date of Proposal submission (a certificate of good standing from the State of Hawai'i Department of Commerce and Consumer Affairs and also federal and Hawai'i state tax clearance certificates for the Proposer may be substituted for the Certificate of Vendor Compliance).
- The Proposal must not be contingent upon changes to existing county, state, or federal laws or regulations.
- The Proposal must be sited on the Pūlama Site.
- The Proposal must be for a PV project and must include an energy storage component.
- The largest contingency size shall be limited to 2.2 MW net export at the Miki Basin switchyard. The design to achieve this must be acceptable to the Company.
- The Proposal must reserve 3 MW of the Facility's contract capacity for CBRE subscriptions.
- A minimum of 0.40 MW of the CBRE Project capacity must be reserved for residential Subscribers as described in Section 1.2.4.
- The energy storage component must be able to be charged from the grid at the direction of the Company as described in Section 1.2.11.
- The Proposal must provide grid-forming and black start capabilities as described in Section 2.1.
- The Proposal must specify a GCOD no later than August 31, 2025.
- The Proposer shall agree to post Development Period Security and Operating Period Security as described in Section 3.13.

¹⁷ Proposal Fees will not be required for the SBO Proposal.

4.3 Threshold Requirement Assessment

Proposals that meet all the Eligibility Requirements will then be evaluated to determine compliance with the Threshold Requirements, which have been designed to screen out Proposals that are insufficiently developed, lack demonstrated technology, or will impose unacceptable execution risk for the Company.

Proposals must provide explanations and contain supporting information demonstrating how and why the Project proposed meets each of the Threshold Requirements. Proposals that fail to provide this information or meet a Threshold Requirement will be eliminated from further consideration upon concurrence with the Independent Observer.

The Threshold Requirements for this RFP are the following:

1. **RESERVED**

2. **Performance Standards:** The proposed Facility must be able to meet the performance attributes identified in this RFP and the Performance Standards identified in Section 2.1 of this RFP. Proposals should include sufficient documentation to support the stated claim that the Facility will be able to meet the Performance Standards. The Proposal should include information required to make such a determination in an organized manner to ensure this evaluation can be completed within the evaluation review period.

3. **Proven Technology:** This criterion is intended as a check to ensure that the technology proposed is viable and can reasonably be relied upon to meet the objectives of this RFP. The Company will only consider Proposals utilizing technologies that have successfully reached commercial operations in commercial applications (i.e., a PPA) at the scale being proposed. Proposals should include any supporting information for the Company to assess the commercial and financial maturity of the technology being proposed as noted in Attachment B, Section 2.12.

4. **Experience of the Proposer:** The Proposer, its affiliated companies, partners, and/or contractors and consultants on the Proposer's Project team must have experience in financing, designing, constructing, interconnecting, owning, operating, and maintaining at least one (1) electricity generation project, including all components of the project (i.e., BESS or other attributes), similar in size, scope, technology, and structure to the Project being proposed by Proposer. The Company will consider a Proposer to have reasonably met this Threshold Requirement if the Proposer can provide sufficient information in its Proposal's RFP Appendix B Section 2.13 tables demonstrating that at least one member of the Proposer's team (identified in the Proposal) has specific experience in each of the following categories: financing, designing, constructing, interconnecting, owning, operating, and maintaining projects similar to the Project being proposed.

5. **Financial Compliance:** The proposed Project must not cause the Company to be subject to consolidation, as set forth in Financial Accounting Standards Board ("FASB") Accounting Standards Codification Topic 810, Consolidation ("ASC 810"), as issued and

amended from time to time by FASB. Proposers are required to state to the best of their knowledge, with supporting information to allow the Company to verify such conclusion, that the Proposal will not result in the Seller under the PPA being a Variable Interest Entity (“VIE”) and result in the Company being the primary beneficiary of the Seller that would trigger consolidation of the Seller’s finances on to the Company’s financial statements under FASB ASC 810. The Company will perform a preliminary consolidation assessment based on the Proposals received. The Company reserves the right to allow a Proposal to proceed through the evaluation process through selection of the Priority List and work with the Proposer on this issue prior to or during PPA negotiations. The Company has determined that for purposes of FASB ASC 842, a generation plus BESS facility will be treated as two separate measurements of account. For accounting purposes, the BESS portion (if applicable) will be treated as a lease, while the generation facility will not. As a result, no lease evaluation will be completed as part of the Proposal evaluation.

6. Community Outreach: Gaining community support is an important part of a Project’s viability and success. A comprehensive community outreach and communications plan (“Community Outreach Plan”) is an essential roadmap that guides a developer as they work with various communities and stakeholders to gain their support for a Project. Proposers must include a Community Outreach Plan that describes the Proposer’s commitment to work with the neighboring community and stakeholders and to provide them timely Project information during all phases of the Project. The Community Outreach Plan shall include, but not be limited to, the following information: Project description, community scoping (including stakeholders and community concerns), Project benefits, government approvals, development process (including Project schedule), and a comprehensive communications plan.

4.4 Evaluation – Price and Non-Price Analysis

Proposals that meet both the Eligibility and Threshold Requirements are Eligible Proposals which will then be subject to a price and non-price assessment. Two teams have been established to undertake the Proposal evaluation process: a Price Evaluation Team and Non-Price Evaluation Team. The results of the price and non-price analysis will be a relative ranking and scoring of all Eligible Proposals. Price-related criteria will account for fifty-one percent (51%) of the total score and non-price-related criteria will account for forty-nine percent (49%) of the total score. The non-price criteria and methodology for applying the criteria are explained in Section 4.4.2.

The Company will employ a closed-bidding process for this solicitation in accordance with Part IV.H.3 of the Framework where the price and non-price evaluation models to be used will not be provided to Proposers. However, the Company will provide the Independent Observer with all necessary information to allow the Independent Observer to understand the evaluation models and to enable the Independent Observer to observe the entire analysis to ensure a fair process.

4.4.1 Evaluation of the Price Related Criteria

For the evaluation price analysis, an avoided cost screening approach will be used to rank proposals. Using the forecast and planning assumptions developed for the Company's Integrated Grid Planning process and evaluation methodology proposed in the Solution Evaluation & Optimization Working Group, a resource portfolio will be developed using a capacity expansion model to identify proxy resources that serve the grid needs and inform their marginal avoided costs. For each Proposal, the avoided cost of each grid service would be multiplied by the expected ability of the Proposal to provide that service or others, and summed across the services to determine the potential benefit of the Proposal. The benefit would then be reduced by the Proposal cost and normalized by the NEP provided in the Proposal to calculate a Levelized Benefit ("LB") (\$/MWh).

The Company will conduct the comparative evaluation and award evaluation points to Proposals in accordance with the relative ranking based on LB. The Eligible Proposal with the highest LB will receive 510 points. All other Eligible Proposals will receive points based on a proportionate reduction using the percentage by which the Eligible Proposal's LB is lower than the highest LB. For example, if a Proposal's LB is ten percent (10%) lower than the highest LB, the Proposal will be awarded 459 points (that is, 510 points less 10%). The result of this assessment will be a ranking and scoring of the Proposals.

4.4.2 Evaluation of the Non-Price Related Criteria

For the non-price analysis, each Proposal will be evaluated on each of the non-price criteria categories set forth below:

1. Community Outreach
2. State of Project Development and Schedule
3. Performance Standards
4. RESERVED
5. Commitment to Residential Subscriber Participation
6. CBRE Program
7. Environmental Compliance and Permitting Plan
8. Experience and Qualifications
9. Financial Strength and Financing Plan
10. RDG PPA Contract Exceptions
11. Guaranteed Commercial Operations Date
12. Cultural Resource Impacts

Criteria 1 through 6 (as applicable) – will be weighted twice as heavily as the others to reflect the impact these categories have to achieve a successful and timely procurement. The non-price criteria are generally scored on a scale of 1 (poor) to 5 (highly preferable). A score of 3 means that a Proposal meets the minimum standard for that criteria.

The total non-price score will be the sum of the scores for each of the applicable individual non-price criteria. The Company will then award non-price evaluation points in accordance with the relative ranking of scores. The Proposal with the highest total

non-price score will receive 490 points, and all other Proposals will receive points equal to the Proposal's score divided by the top score, multiplied by 490.

During the non-price criteria evaluation, a fatal flaws analysis will also be conducted such that any Proposal that is deemed not to meet the minimum standards level for four (4) or more applicable non-price criteria will be disqualified given that the Proposal has failed to meet the required number of non-price factors that are indicative as to the general feasibility and operational viability of a proposed Project. Non-price criteria numbers 5 and 11 above will be excluded from the fatal flaws analysis.

The Company's evaluation of the non-price criteria will be based on the materials provided by a Proposer in its Proposal. Acceptance of any Proposal into the Final Award Group shall not be assumed or construed to be an endorsement or approval that the materials provided by Proposer are complete, accurate or in compliance with applicable law. The Company assumes no obligation to correct, confirm or further research any of the materials submitted by Proposers. Proposers retain sole responsibility to ensure their Proposals are accurate and in compliance with all laws.

The non-price criteria are:

1. **Community Outreach** – Gaining community support is an important part of a Project's viability and success. An effective Community Outreach Plan will call for early meaningful communications with stakeholders and will reflect a deep understanding and respect for the community's desire for information to enable them to make informed decisions about future projects in their communities. Therefore, Proposals will be evaluated on the quality of the Community Outreach Plan to inform the Project's impacted communities.

Proposals should include a Community Outreach Plan that describes the Proposer's commitment to work with the neighboring community and stakeholders and to provide timely Project information during Project development, construction and operation. The Community Outreach Plan shall include, but not be limited to the following:

- 1) Project description. A thorough description including a map of the location of the Project. This information will help the community understand the impact that the Project may have on the community.
- 2) Community scoping. Identify stakeholders (individuals, community leaders, organizations), community issues and concerns, and community sentiment.
- 3) Project benefits. An explanation of the need for the Project. This will help the community to understand how the Project might benefit their community.
- 4) Government approvals. Required government permits and approvals, public hearings and other opportunities for public comment. This information will help the community to understand the level of public scrutiny and participation that might occur for the Project and the opportunities to provide public comments.
- 5) Development process. A Project schedule that identifies key milestones will facilitate the community's understanding of the development process.

- 6) **Communications Plan.** A communications plan including a detailed community outreach schedule that will keep the affected communities and stakeholders informed about the Project's outreach efforts during early Project development period through construction and operations.

Preference will be given to Proposers who have already identified established contacts to work with the local community, have used community input to incorporate changes to the final design of the Project and mitigate community concerns, have proposed a community benefits package (including details of the community recipients and benefits package), or have community consultants as part of the Project team doing business in Hawai'i that have successfully worked with communities in Hawai'i on the development of two or more energy projects or projects with similar community issues. These criteria are aligned with the Company's community engagement expectation whereby all developers will be required to engage in community outreach prior to signing a PPA with the Company. This process is also outlined in RFP Section 5.3. Further information and instructions regarding expectations for the Community Outreach Plan are included as Attachment 4 and 5 to Appendix B.

2. **State of Project Development and Schedule** – Projects that are further along in development generally have lower project execution risk and a greater probability of being able to be successfully placed into service prior to the GCOD (specifically identified in each Proposal). At a minimum, Projects should demonstrate how they plan to capture any ITC safe harbor and reach their GCOD specified, including identification of risks and schedule assumptions. (Schedules must identify the IRS completion date and PUC approval dates assumed.) Proposals should also demonstrate, via a detailed critical path schedule, that there is a high likelihood that the Project will be able to reach commercial operations as specified. Proposals shall include a Gantt chart that clearly illustrates the overall schedule and demonstrates achievement of any ITC safe harbor, if applicable, and commercial operations by their specified GCOD. The Gantt chart shall include task durations and dependencies, identify tasks that will be fast tracked, and identifies slack time and contingencies. This criterion will also look at the high-level Project costs set forth in the Proposal including: costs for equipment, construction, engineering, Seller-Owned Interconnection Facilities, Company-Owned Interconnection Facilities, land, annual O&M, the reasonableness of such costs and the assumptions used for such costs. Project costs that do not appear reasonable for a project of the size proposed may result in a lower ranking for this criterion if the Company reasonably determines that the cost information is unrealistic based on prior experience in the market which may result in a risk that the Project can be built on time and for the price proposed by the Proposer. The Company reserves the right to discuss any cost and financial information with a Proposer to ensure the information provided is accurate and correct.
3. **Performance Standards:** The proposed Facility must be able to meet the performance attributes identified in this RFP and the Performance Standards

identified in the RDG PPA. The Company will review the Proposal information received, including design documents and operating procedures materials provided in the Proposal, and evaluate whether the Project as designed is able to meet the Performance Standards identified in the RDG PPA or and in this RFP. At a minimum, in addition to meeting the Performance Standards, the Proposal should include sufficient documentation, provided in an organized manner, to support the stated claim that the Facility will be able to meet the Performance Standards. The Proposal should include information required to make such a determination in an organized manner to ensure this evaluation can be completed on a timely basis. Preference will be given to Proposals that provide detailed technical and design information showing how each standard can be met by the proposed Facility. Preference will also be provided on facilities that offer additional capabilities.

4. **RESERVED**

5. **Commitment to Residential Subscriber Participation** – Proposals will be evaluated on the stated commitments of the Project’s Subscriber Organization to residential Subscribers. At a minimum, Subscriber Organizations will be required to set aside 0.40 MW of the CBRE Project capacity for residential Subscribers. Proposers that commit to reserving a portion larger than 0.40 MW of their CBRE Project capacity for residential Subscribers will be given more favorable scoring. In addition, Proposals will also be evaluated on the stated commitments of the Project’s CBRE Subscriber Organization to LMI Customers. Proposers that commit to reserving a portion of the CBRE Project capacity for LMI Customers will be given more favorable scoring.

6. **CBRE Program:** Proposals will be evaluated on several facets of the CBRE Program being proposed.

1) **Program Offering:** Proposals will be evaluated to give preference to program offerings that provide the most benefits to residential and LMI Customers, as applicable. Financing options, upfront fees, payment over time, public funding options, and other creative approaches will be preferred along with programs that offer higher expected customer level savings, favorable payback periods and mechanisms, and other customer benefits. In addition, Proposals shall describe the extent to which residential Subscribers will be financially responsible for the Facility’s underperformance.

2) **Marketing and Outreach Plans:** Proposals will be evaluated on the proposed strategies and methods to educate, inform, and stimulate the market in order to achieve their target levels of participation.

3) **Program Experience:** Proposals will also be evaluated on Proposers documented success in reaching and retaining participation of residential and LMI Customers, as applicable, in other community-based renewable energy programs.

7. **Environmental Compliance and Permitting Plan** – This criterion relates to the potential (short- and long-term) environmental impacts associated with each project, the quality of the plan offered by the Proposer to mitigate and manage any environmental impacts (including any pre-existing environmental conditions), and the plan of Proposers to remain in environmental compliance over the term of the contract. These impacts are reflected on a technology-specific basis. Completing any necessary environmental review and obtaining the required permitting in a timely manner is also important and Proposals will be evaluated on their plan to identify, apply for, and secure the required permits for the Project, any permitting activity that has been completed to date, including having initial discussions with the applicable regulating agencies such as U.S. Fish and Wildlife and the State of Hawai‘i Department of Land and Natural Resources’ Division of Forestry and Wildlife, prior to submitting a Proposal, and the degree of certainty offered by the Proposer in securing the necessary permits.

At a minimum, proposed Projects should be expected to have minimal environmental impact for most areas and Proposals should provide a comprehensive plan to mitigate the identified potential or actual significant environmental impacts to remain in environmental compliance. The proposed mitigation plans should be included in the Project timeline. Preference will be given to Proposals that provide a more detailed plan as well as those that have proactively taken steps to mitigate potential environmental impacts.

Also, this criterion requires that, at a minimum, Proposers should have identified, and disclosed in their Proposal(s) all major permits, approvals, appurtenances and entitlements (including applicable access, rights of way and/or easements) (collectively, the “permits”) required and have a preliminary plan for securing such permits. Preference will be given to Proposals that are able to provide a greater degree of certainty that its plan to secure the required permits is realistic and achievable, or have already received all or a majority of the required permits. The Proposer should disclose all identified (a) discretionary permits required, i.e., those requiring public or contested case hearings and/or review and discretionary approval by an appropriate government agency and (b) ministerial conditions without discretionary approval conditions. In all cases, the Proposer must provide a credible and viable plan to secure all necessary and appropriate permits necessary for the project. For example, if the project is located within an agricultural district, the Proposer shall provide evidence of Proposer’s verification with the appropriate government agency that the project complies with HRS Section 205-2 and Section 205-4.5, relating to solar energy facilities placed on agricultural land, provided, however that where a special use permit (under Section 205-6), exemption (under Section 205-6), or amendment to land use district boundary lines (under Section 205-4) is required to secure such compliance, Proposer shall identify the need for such permit, exemption or amendment and provide a list of required prerequisites and/or conditions and a realistic timeline necessary to obtain such permit, exemption or amendment satisfactory for Proposer to still meet its designated Guaranteed Commercial Operations Date.

8. **Experience and Qualifications** – Proposals will be evaluated based on the experience of the Proposer in financing, designing, constructing, interconnecting, owning, operating, and maintaining projects (including all components of the project) of similar size, scope and technology. At a minimum, Proposals must show via the table format specified in RFP Appendix B Section 2.13 that at least one (1) member must have specific experience in each of the following categories: financing, designing, constructing, interconnecting, owning, operating, and maintaining at least one electricity generation project including all components of the project similar to the Project being proposed. Preference will be given to Proposers with experience in successfully developing multiple projects that are similar to the one being proposed and/or that have prior experience successfully developing and interconnecting a utility scale project to the Company's System.
9. **Financial Strength and Financing Plan** – This criterion addresses the comprehensiveness and reasonableness of the financial plan for the Project as well as assesses the financial strength and capability of the Proposer to develop the Project. A complete financial plan addresses the following issues: Project ownership, capital cost and capital structure, sources of debt and equity, and evidence that credit-worthy entities are interested in financing the Project. The financial strength of Proposers or their credit support providers will be considered, including their credit ratings. The financing participants are expected to be reasonably strong financially. Developers and their sources of capital that have investment grade credit ratings from a reputable credit rating agency (S&P, Moody's, Fitch) will also be given preference, with those that have higher credit ratings ranked higher.
10. **RDG PPA Contract Proposed Modifications** – Proposers are encouraged to accept the contract terms identified in the model RDG PPA in its entirety in order to expedite the overall RFP process and potential contract negotiations. Proposers who accept the model RDG PPA without edits, will receive a higher score and will be the only proposals that can achieve the highest scoring for this non-price evaluation criterion. Technology-specific or operating characteristic-required modifications, with adequate explanation as to the necessity of such modifications, will not jeopardize a project's ability to achieve the highest score. Proposers who elect to propose modifications to the model agreements shall provide a Microsoft Word red-line version of the applicable document identifying specific proposed modifications to the model agreement language, as well as a detailed explanation and supporting rationale for each modification. General comments without proposed alternate language, drafting notes without explanation or alternate language, footnotes such as "parties to discuss," or a reservation of rights to make additional modifications to the model agreements at a later time are unacceptable, will be considered unresponsive, and will result in a lower score. See also Section 3.8. The Company and Independent Observer will evaluate the impact that the proposed modifications will have on the overall risk assessment associated with the evaluation of each Proposal.
11. **Guaranteed Commercial Operations Date** – Proposers that are able to design for and commit to an earlier GCOD will be given more favorable scoring. Proposers will

be held to the GCOD identified in their Proposal. The GCOD will be a Guaranteed Milestone and will be inserted without amendment into the RDG PPA, as applicable.

12. **Cultural Resource Impacts** – Proposers need to be mindful of the Project’s potential impacts to historical and cultural resources. Proposers should have identified (1) valued cultural, historical, or natural resources in the area in question, including the extent to which traditional and customary native Hawaiian rights are exercised in the area; (2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken to reasonably protect any identified cultural, historical, or natural resources in the area in question, and the reasonable protection of traditional and customary native Hawaiian rights in the affected area.

Also, Proposers should have already contracted with a consultant with expertise in this field to begin a cultural impact plan for the Project. Proposals will be evaluated on the commitment to addressing cultural resource impacts on their Project, if any. Therefore, in order to be evaluated for this criterion, Proposers should, at least, provide the following documentation, as applicable: (1) Proposer’s or its consultant’s experience with cultural resource impacts on past projects; (2) the status of their cultural impact plan. Proposals will be evaluated on the extent to which their cultural impact plan has been developed, and preference will be given to Proposals that are further along in the process, including but not limited to, whether a mitigation/action plan has been provided that addresses any identified cultural resource issues, or a date for when such a plan will be available has been identified, or any portions of such plan have been completed.

4.5 Selection of the Final Award Group

At the conclusion of both the price and non-price analysis, a total score will be calculated for each Eligible Proposal using the 51% price-related criteria/ 49% non-price-related criteria weighting outlined above. The price and non-price analysis, and the summation of both price and non-price scores described above, will result in a ranking of Proposals.

Based on the results of this Evaluation and review with the Independent Observer, the Company will select a Proposal to the Final Award Group from which to begin contract negotiations. All Proposers will be notified at this stage of the evaluation process whether their Proposal is included in the Final Award Group.

Selection to the Final Award Group and/or entering into contract negotiations does not guarantee execution of a PPA.

Further, if at any time during the evaluation process it is discovered that a Proposer’s Proposal contains incorrect or misrepresented information that has a material effect on any of the evaluation processes, including selection of the Final Award Group, the

Company reserves the right, at any time prior to submission of the PPA application with the PUC, in consultation with the Independent Observer, to disqualify the Proposer from the RFP. If discovery of the incorrect or misrepresented information is made after the Company has filed its PUC application for approval of the PPA with the Proposer, the Company will disclose the incorrect or misrepresented information to the PUC for evaluation and decision as to whether such Proposer should be disqualified and the Company's application dismissed.

Following any removal of a Proposal from the Final Award Group, either by disqualification noted immediately above, or via any other removal or withdrawal of a Proposal, including failure to reach agreement on the PPA, the Company, taking into consideration the timing of such removal and the current status of the Company's needs under the RFP, in consultation with and concurrence from the Independent Observer, will determine if another Proposal should be added to the Final Award Group.

Chapter 5: Post Evaluation Process

5.1 Interconnection Requirements Study Process

A summary of the model requirements and impact study scope can be found in Appendix B, Attachment 6.

A complete package of Project Interconnection Data Request worksheets, Project single line and three line diagrams, models for equipment and controls, list(s) to clearly identify the components and respective files (for inverters and power plant controller), and complete documentation with instructions, shall be submitted for each Proposal within 30 days after selection to a Final Award Group (see Section 2.11 of Appendix B).

PSSE Generic models, PSSE User models, and ASPEN models shall be configured to represent all of the functional equipment with settings in place to comply with the Company's performance requirements. These must be checked for functionality by the Proposer or its vendors and consultants prior to submission to the Company. Similarly, fully accurate PSCAD models shall be submitted in a condition that complies with the PSCAD modeling guidelines provided by the Company. PSSE generic models shall be provided promptly after the PSSE user models have been approved by the Company.

After proposals and models are submitted, the Company will inspect the data packages for general completeness. For any incomplete submissions, a list of missing or non-functional items will be provided. Proposers will be given 15 Days to resolve data and modeling deficiencies. The Company, in consultation with the Independent Observer, may remove Proposals from being selected to the Final Award Group or may terminate PPA negotiations or executed PPAs, if their submission requirements are deemed incomplete for the lack of requested models. Proposals that are complete will be considered for further evaluation. A formal, technical model checkout will be deferred until a later date when IRS Agreements and deposits are in place, so that the expert subject matter work can be provided by the Company's IRS consultant(s).

Upon notification of selection to the Final Award Group, the Company will provide a draft IRS Agreement for the selected Project, with a statement of required deposit for individual and prorated work as part of an IRS Scope for a System Impact Study that will involve (a) technical model checkout for the project and (b) any considerations that are specific to the particular project and location. Interconnection cost and schedule, including cost of any required system upgrades, will be determined in a subsequent Facility Study.

The technical model checkouts will be conducted first. Upon identification of any functional problems or deficiencies, corrective action shall be taken immediately and on an interactive basis so that the problems or deficiencies can be resolved within 15 Days, including re-submission of data and updated models, or the Project shall be deemed withdrawn. At the discretion of the Company and provided that there is a demonstration of good faith action to minimize delay that would affect the schedule for IRS analyses, a second round of model checkout and problem solving may proceed. Thereafter any notice that a Project is deemed withdrawn for lack of completeness shall be final. Subject to consultation with the Independent Observer, failure to provide all requested material within the time(s) specified, or changes to the data provided after the due date(s), shall result in elimination from the Final Award Group.

Proposers shall be responsible for the cost of the IRS, under separate agreements for the System Impact Study and the Facility Study. The overall IRS will provide information including, but not limited to, an estimated cost and schedule for the required Interconnection Facilities for a particular Project and any required mitigation measures. Proposers will be responsible for the actual final costs of all Seller-Owned Interconnection Facilities and Company-Owned Interconnection Facilities. Upon reviewing the results of the IRS, Proposers will have the opportunity to declare the PPA (see Section 12.4) null and void in the event that the estimated interconnection costs and schedule for the Project are higher than what was estimated in the Project Proposal.

5.2 Contract Negotiation Process

Within five (5) business days of being notified by the Company of its intent to enter into RDG PPA contract negotiations, the Proposer selected for the Final Award Group will be required to indicate, in writing to the Company's primary contact for this RFP, whether it intends to proceed with its Proposal. The awarded Proposer will be required to keep its Proposal valid through the award period. Contract negotiations will take place in parallel with the IRS process.

The Company intends to execute and file the PPA with the PUC for approval and later amend the PPA to include the results of the IRS.

5.3 Final Award Group Commitments

5.3.1 Community Outreach and Engagement / Cultural Resource Impacts

The public meeting and comment solicitation process described in this Section and Section 29.21 of the RDG PPA (Community Outreach Plan) do not represent the only

community outreach and engagement activities that can or should be performed by a Proposer.

The Company will publicly announce the Final Award Group no more than five (5) business days after the notification is given to Proposers who are selected to the Final Award Group. Selected Proposers shall not disclose their selection to the public before the Company publicly announces the Final Award Group selection.

On the next business day after the Company notifies a Proposer they were selected, the Proposer shall provide the Company with links to their Project website, which the Company will post on the Company's website. The Proposer will launch a Project website that will go-live on the day the Company publicly announces the Final Award Group selection. Information on what should be included on the Project website is identified in Appendix B.

Within five (5) business days of notification of selection to the Final Award Group, Proposers must have provided the Company with an updated comprehensive Community Outreach Plan to work with and inform neighboring communities and stakeholders and to provide them timely information during all phases of the Project. The Community Outreach Plan shall include but not be limited to the following information: Project description, Project stakeholders, community concerns and Proposer's efforts to address such concerns, Project benefits, government approvals, Project schedule, and a comprehensive communications plan. The Proposer's Community Outreach Plan shall be a public document identified on the Proposer's website for the term of the PPA and made available to the public upon request. As an option, Proposers may provide their updated Community Outreach Plan and website information to the Company for review and feedback. If provided at least 30 days prior to the dates required, the Company will endeavor to review such information and provide feedback on the information before it is made available to the public. Details on the Community Outreach Plan can be found in Appendix B, Attachments 4 and 5.

Prior to the execution date of the PPA, Proposers shall also provide reasonable advance notice and host a public meeting in the community where the proposed Project is to be located for community and neighborhood groups in and around the vicinity of the Project Site that provided the neighboring community, stakeholders and the general public with: (i) a reasonable opportunity to learn about the proposed Project; (ii) an opportunity to engage in a dialogue about concerns, mitigation measures, and potential community benefits of the proposed Project; and (iii) information concerning the process and/or intent for the public's input and engagement, including advising attendees that they will have thirty (30) calendar days from the date of said public meeting to submit written comments to Company and/or Proposer for inclusion in the Company's submission to the PUC of its application for a satisfactory PUC Approval Order. The Proposer shall collect all public comments, and then provide the Company copies of all comments received in their original, unedited form, along with copies of all comments with personal information redacted and ready for filing. If a PPA is executed by the Proposer and the Company, the Company may submit any and all public comments (presented in its original, unedited form) as part of its PUC application for this Project. Proposers shall

notify the public at least three weeks in advance of the meeting. The Company shall be informed of the meeting. The Company has provided Proposers with detailed instructions regarding the community meeting requirement after the selection of the Final Award Group (Attachment 4 to Appendix B. (For example, notice will be published in county or regional newspapers/media, as well as media with statewide distribution. The Proposer will be directed to notify certain individuals and organizations. The Proposer will be provided templates to use for the public meeting notices, agenda, and presentation.) Proposers must also comply with any other requirement set forth in the PPA relating to Community Outreach.

Following the submission of the PUC application for the Project, and prior to the date when the Parties' statements of position are to be filed in the docketed PUC proceeding for the Project, the Proposer shall provide another opportunity for the public to comment on the proposed Project.

The Proposer shall be responsible for community outreach and engagement for the Project, and that the public meeting and comment solicitation process described in this section do not represent the only community outreach and engagement activities that can or should be performed.

Within 5 Days of the start of PPA negotiations, the Proposer shall contract with a consultant to begin a cultural impact assessment for the Project. The consultant shall identify (1) valued cultural, historical, or natural resources in the area in question, including the extent to which traditional and customary native Hawaiian rights are exercised in the area; (2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken to reasonably protect native Hawaiian rights if they are found to exist.

5.3.2 Ocular Impact Study

Due to the proximity to the Lāna‘i Airport, the Proposer shall complete an ocular impact study for review by the State of Hawai‘i Department of Transportation and any other federal or state agency that may request such study. When designing the facility, the developer should take care to develop panel placement and select materials that will not result in glint and glare issues for air traffic at the Lāna‘i Airport.

5.4 Greenhouse Gas Emissions Analysis

The Proposer whose Proposal is selected for the Final Award Group shall cooperate with and promptly provide to the Company and/or Company's consultant(s) upon request, all information necessary, in the Company's sole and exclusive discretion, for such consultant to prepare a greenhouse gas ("GHG") emissions analysis and report in support of a PUC application for approval of the PPA for the project (the "GHG Review"). Proposers shall be responsible for the full cost of the GHG Review associated with their project under a Greenhouse Gas Analysis Letter Agreement between the Proposer and the Company. The GHG Review is anticipated to address whether the GHG emissions that

would result from approval of the PPA and subsequent to addition of the Project to the Company's system are greater than the GHG emissions that would result from the operations of the Company's System without the addition of the Project, whether the cost for renewable, dispatchable generation, and/or energy storage services as applicable under the PPA is reasonable in light of the potential for GHG emissions, and whether the terms of the PPA are prudent and in the public interest in light of its potential hidden and long-term consequences.

5.5 PUC Approval of PPA

Any signed PPA resulting from this RFP is subject to PUC approval as described in the RDG PPA, including Article 12 and Section 29.20 thereof.

5.6 Facility In-Service

In order to facilitate the timely commissioning of the project selected through this RFP, the Company requires the following be included with the 60% design drawings: relay settings and protection coordination study, including fuse selection and ac/dc schematic trip scheme.

For the Company to test the Facility, coordination between the Company and Project is required. Drawings must be approved by the Company prior to testing. The entire Facility must be ready for testing to commence. Piecemeal testing will not be allowed. Communication infrastructure and equipment must be tested by the Proposer and ready for operation prior to Company testing.

If approved drawings are not available, or if the Facility is otherwise not test ready as scheduled, the Project may lose its place in the queue, with the Company retaining the flexibility to adjust scheduling as it sees fit. If tests are not completed within the allotted scheduled testing time, the Project will be moved to the end of the Company's testing queue. The Proposer will be allowed to cure if successful testing is completed within the allotted scheduled time. No adjustments will be made to PPA milestones if tests are not completed within the original allotted time. Liquidated damages for missed milestones will be assessed pursuant to the PPA.

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

MARCH 30, 2021

Docket No. 2015-0389

Appendix A – Definitions



**Maui
Electric**

“Affiliate” means any person or entity that possesses an “affiliated interest” in a utility as defined by section 269-19.5, Hawaii Revised Statutes (“HRS”), including a utility’s parent holding company but excluding a utility’s subsidiary or parent which is also a regulated utility.

“Allowed Capacity” has the meaning set forth in the RDG PPA.

“Battery Energy Storage System” or “BESS” has the meaning set forth in the RDG PPA and Mid-Tier SFC.

“BESS Contract Capacity” has the meaning set forth in the RDG PPA and Mid-Tier SFC.

“Code of Conduct” means the code of conduct approved by the PUC in Docket No. 03-0372 (Decision and Order No. 23614, August 28, 2007) with respect to a Self-Build Option. An updated code of conduct was submitted to the PUC in Docket No. 2015-0389 on July 9, 2020.

“Code of Conduct Procedures Manual” or “Procedures Manual” means the manual approved by the PUC, which was put in place to address and to safeguard against preferential treatment or preferential access to information in a Hawaiian Electric, Maui Electric, or Hawaii Electric Light RFP process. The Procedures Manual is attached as Appendix C to this RFP.

“Commercial Operations” has the meaning set forth in the RDG PPA.

“Community Outreach Plan” is a community outreach and communication plan described in Section 4.3 and 4.4.2 of this RFP.

“Company” means Maui Electric Company, Ltd., a Hawai‘i corporation.

“Company-Owned Interconnection Facilities” has the meaning set forth in the RDG PPA.

“Competitive Bidding Framework” or “Framework” means the Framework for Competitive Bidding contained in Decision and Order No. 23121 issued by the Public Utilities Commission on December 8, 2006, and any subsequent orders providing for modifications from those set forth in Order No. 23121 issued December 8, 2006.

“Consumer Advocate” means the Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs of the State of Hawai‘i.

“Day” means a calendar day, unless the term “business day” is used, which means calendar day excluding weekends and federal and State of Hawai‘i holidays.

“Development Period Security” has the meaning set forth in Section 14.2 of the RDG PPA.

“Dispatchable” means the ability to turn on or turn off a generating resource at the request of the utility’s system operators, or the ability to increase or decrease the output of a generating resource from moment to moment in response to signals from a utility’s Automatic Generation Control System, Energy Management System or similar control system, or at the request of the utility’s system operators.

“Electronic Procurement Platform” means the third-party web-based sourcing platform that will be used for the intake of Proposals and associated electronic information, storage and handling of Proposer information, and communication.

“Eligibility Requirements” has the meaning set forth in Section 4.2 of this RFP.

“Eligible Proposals” means Proposals that meet both the Eligibility and Threshold Requirements.

“Energy Contract Manager” is the primary Company contact for this RFP.

“Evaluation Team” means agents of the Company who evaluate Proposals.

“Facility” has the meaning set forth in the RDG PPA.

“Facility Study” means a study to develop the interconnection facilities cost and schedule estimate including the cost associated with the design and construction of the Company-owned interconnection facilities.

“Final Award Group” means the Proposer selected by the Company which the Company will begin contract negotiations with, based on the results of the Company’s evaluation.

“Greenhouse Gas” or “GHG” are gases that contribute to the greenhouse gas effect and trap heat in the atmosphere.

“Guaranteed Commercial Operations Date” or “GCOD” means the date on which a Facility first achieves Commercial Operations.

“Hawaiian Electric” means Hawaiian Electric Company, Inc., a Hawai‘i corporation.

“Hawaiian Electric Companies” or “Companies” means Hawaiian Electric Company, Inc. and its subsidiaries, Hawaii Electric Light Company, Inc. and Maui Electric Company, Limited.

“HRS” means the Hawai‘i Revised Statutes as of the date of this Request for Proposals.

“Imputed Debt” means adjustments to the debt amounts reported on financial statements prepared under generally accepted accounting principles (“GAAP”). Certain obligations do not meet the GAAP criteria of “debt” but have debt-like characteristics; therefore, credit rating agencies “impute debt and interest” in evaluating the financial ratios of a company.

“Independent Observer” has the meaning set forth in Section 1.4 of this RFP.

“Independent Power Producer” or “IPP” means an entity that owns or operates an electricity generating facility that is not included in the Company’s rate base.

“Interconnection Facilities” means the equipment and devices required to permit a Facility to operate in parallel with, and deliver electric energy to, the Company System (in accordance with applicable provisions of the Commission’s General Order No. 7, Company tariffs, operational practices, interconnection requirements studies, and planning criteria), such as, but not limited to, transmission and distribution lines, transformers, switches, and circuit breakers. Interconnection

Facilities includes Company-Owned Interconnection Facilities and Seller-Owned Interconnection Facilities.

“Interconnection Requirements Study” or “IRS” means a study, performed in accordance with the terms of the IRS Letter Agreement, to assess, among other things, (1) the system requirements and equipment requirements to interconnect the Facility with the Company System, (2) the Performance Standards of the Facility, and (3) an estimate of interconnection costs and project schedule for interconnection of the Facility.

“kV” means kilovolt.

“Levelized Benefit” or “LB” means a calculation (\$/MWh) used for comparison of Proposals based on information provided in the Proposal submission in this RFP.

“Low- and Moderate-Income Customer” or “LMI Customer” is as defined in Tariff Rule No. 29 in Appendix J.

“Lump Sum Payment” has the meaning set forth in the RDG PPA. It may also be referred to as a monthly Lump Sum Payment to reflect the portion of the payment made each month.

“Maui Electric” means Maui Electric Company, Ltd., a Hawai‘i corporation.

“Maui Electric System” or “System” means the electric system owned and operated by Maui Electric on the island of Lāna‘i (including any non-utility owned facilities) consisting of power plants, transmission and distribution lines, and related equipment for the production and delivery of electric power to the public.

“Maximum Rated Output” has the meaning set forth in the RDG PPA or Mid-Tier SFC.

“Mediation” means the confidential mediation conducted in Honolulu, Hawai‘i, pursuant to and in accordance with the Mediation Rules, Procedures, and Protocols of Dispute Prevention Resolution, Inc. (or its successor) or, in its absence, the American Arbitration Association then in effect.

“MW” means megawatt.

“MWh” means megawatt hour.

“NDA” means the Mutual Confidentiality and Non-Disclosure Agreement attached to this RFP as Appendix E.

“NEP” means Net Energy Potential.

“NEP RFP Projection” has the meaning set forth in the RDG PPA and Mid-Tier SFC.

“Non-Price Evaluation Team” means Employees and consultants of the Company who evaluate the Proposal non-price related criteria as set forth in Section 4.4 of this RFP. Non-Price Evaluation Team members will not include any Shared Resources and will be solely made up of Company RFP Team Members.

“O&M” means operation and maintenance.

“Operating Period Security” has the meaning set forth in Section 14.4 of the RDG PPA.

“Performance Standards” means the various performance standards for the operation of the Facility to the Company as set forth in Section 2.10 of Appendix B, as such standards may be revised from time to time pursuant to Article 23 of the RDG PPA, and as described in Chapter 2 of this RFP.

“Point of Interconnection” or “POI” has the meaning set forth in the RDG PPA.

“Power Purchase Agreement” or “PPA” means an agreement between an electric utility company and the developer of a renewable energy generation facility to sell the power generated by the facility to the electric utility company.

“Price Evaluation Team” means Employees and consultants of the Company who evaluate the Proposal price related criteria as set forth in Section 4.4 of this RFP. Price Evaluation Team members will not include any Shared Resources and will be solely made up of Company RFP Team Members.

“Project” means a Facility proposed to Maui Electric by a Proposer pursuant to this RFP.

“Proposal” means a proposal submitted to Maui Electric by a Proposer pursuant to this RFP.

“Proposal Due Date” means the date stated in RFP Schedule for the Self-Build Proposal and Row 7 for the IPP and Affiliate Proposal of this RFP.

“Proposal Fee” means the non-refundable fee for each proposal submitted as set forth in Section 1.8 of this RFP.

“Proposer” means a person or entity that submits a Proposal to Maui Electric pursuant to this RFP.

“Proposer’s Response Package” means the form in which the Proposal should be submitted, which is attached as Appendix B to this RFP.

“PUC” means the State of Hawai‘i Public Utilities Commission.

“RDG PPA” means the Model PV + BESS Renewable Dispatchable Generation Power Purchase Agreement attached as Appendix L to this RFP.

“Renewable Portfolio Standards” or “RPS” means the Hawai‘i law that mandates that the Company and its subsidiaries generate or purchase certain amounts of their net electricity sales over time from qualified renewable resources. The RPS requirements in Hawai‘i are currently codified in HRS §§ 269-91 through 269-95.

“Request for Proposals” or “RFP” means a request for Proposals issued pursuant to a competitive bidding process authorized, reviewed, and approved by the PUC.

“RFP Schedule” means the schedule set forth in Table 1, Section 3.1 of this RFP.

“Round Trip Efficiency” or “RTE” has the meaning set forth in the RDG PPA.

“Self-Build Option” or “SBO” means a Proposal submitted by the Company that is responsive to the resource need identified in the RFP, as required by Section VI of the Framework.

“Self-Build Team” means agents of the Company who develop Self-Build Option proposals.

“Seller” means the entity that the Company is contracting with, as set forth in the RDG PPA.

“Seller-Owned Interconnection Facilities” has the meaning set forth in the RDG PPA.

“Site” means the parcel of real property on which the Facility, or any portion thereof, will be constructed and located, together with any Land Rights reasonably necessary for the construction, ownership, operation, and maintenance of the Facility.

“System Impact Study” means a study analyzing the steady-state and dynamic impacts on system power flow, voltage, frequency and transient stability. The analyses includes compatibility of design, construction and operation of the Project with Company engineering standards and operating practices.

“Threshold Requirements” has the meaning set forth in Section 4.3 of this RFP.

Any capitalized term not defined in this RFP has the meaning set forth in the RDG PPA.

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

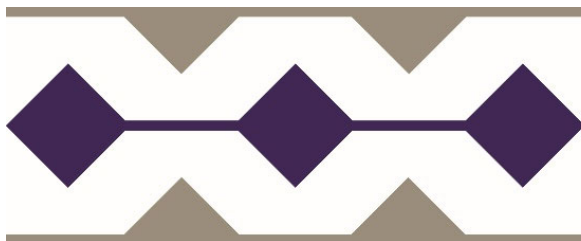
AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

MARCH 30, 2021

Docket No. 2015-0389

*Appendix B – Proposer’s Response Package /
Project Interconnection Data Request*



**Maui
Electric**

1.0 GENERAL INSTRUCTIONS TO PROPOSERS

The Company has elected to use the services of PowerAdvocate®, a third-party electronic platform provider. Sourcing Intelligence®, developed by PowerAdvocate®, is the Electronic Procurement Platform that the Company has licensed and will utilize for the RFP process. All Proposals and all relevant information must be submitted via the Electronic Procurement Platform, in the manner described in this RFP.

Proposers must adhere to the response structure and file naming conventions identified in this Appendix for the Proposer's response package. Information submitted in the wrong location/section or submitted through communication means not specifically identified by the Company will not be considered by the Company.

Proposers must provide a response for every item. If input/submission items in the RFP are not applicable to a specific Proposer or Proposal, Proposers must clearly mark such items as "N/A" (Not Applicable) and provide a brief explanation.

Proposers must clearly identify all confidential information in their Proposals, as described in more detail in Section 3.12 of the RFP.

All information (including attachments) must be provided in English. All financial information must be provided in U.S. Dollars and using U.S. credit ratings.

It is the Proposer's sole responsibility to notify the Company of any conflicting requirements, ambiguities, omission of information, or the need for clarification prior to submitting a Proposal.

The RFP will be conducted as a "Sealed Bid" event within Sourcing Intelligence, meaning the Company will not be able to see or access any of the Proposer's submitted information until after the event closes.

1.1 ELECTRONIC PROCUREMENT PLATFORM

To access the RFP event, the Proposer must register as a "Supplier"¹ on Sourcing Intelligence (Electronic Procurement Platform). One Proposal may be submitted with each Supplier registration.

If a Proposer is already registered on Sourcing Intelligence, the Proposer may use their current login information to submit their Proposal. Proposers are asked to refer to their chosen unique company name throughout when referring to it in text responses.

Proposers can register for an account on Sourcing Intelligence by clicking on the "Registration" button (located in the top right corner of the webpage) on the PowerAdvocate website at the following address:

www.poweradvocate.com

The Proposer's use of the Electronic Procurement Platform is governed by PowerAdvocate's Terms of Use. By registering as a "Supplier" on the Electronic Procurement Platform, the Proposer acknowledges that the Proposer has read these Terms of Use and accepts and agrees that, each time the Proposer uses the Electronic Procurement

¹ The language in Appendix B sometimes refers to "Energy Contract Managers" as "Bid Event Coordinator" and to "Proposers" as "Suppliers" (Bid Event Coordinator and Supplier are terms used by PowerAdvocate).

Platform, the Proposer will be bound by the Terms of Use then accessible through the link(s) on the PowerAdvocate login page.

Once a Proposer has successfully registered as a “Supplier” with PowerAdvocate, the Proposer shall request access to the subject RFP event from the Company Contact via Email through the RFP Email address set forth in Section 1.6 of the RFP. The Email request must list the Company Name field and username under which the Proposer has registered with PowerAdvocate. After being added to the event, the Proposer will see the bid event on their dashboard upon logging into Sourcing Intelligence. Once the RFP event opens, the Proposer may begin submitting their Proposal.

After registering and prior to the opening of the RFP, Proposers are encouraged to familiarize themselves with the Electronic Procurement Platform, including tabs, the dashboard, PowerAdvocate Users Guide (RFP Appendix D), etc. Proposers should note that they will not be able to access any bid documents until the event officially opens.

Proposers may contact PowerAdvocate Support for help with registration or modification of registration if desired. Support is available from 8 AM to 8 PM Eastern Time (2 AM to 2 PM Hawai‘i Standard Time when daylight savings is in effect) Monday to Friday, except for Holidays posted on the PowerAdvocate website, both by phone (857-453-5800) and by Email (support@poweradvocate.com).

Contact information for PowerAdvocate Support can also be found on the bottom border of the PowerAdvocate website: www.poweradvocate.com

Once the RFP event is opened, registered Proposers will have online access to general notices and RFP-related documents via the Electronic Procurement Platform. Proposers should also monitor the RFP Website throughout the RFP event.

1.2 PROPOSAL SUBMISSION PROCEDURES

An Email notification will be sent to all registered Proposers when the event has been opened to receive Proposals.

After logging onto the Electronic Procurement Platform, the RFP will be visible on the Proposer’s dashboard with several tabs, including the following:

- **“1. Download Documents:”** Documents stored under this tab are provided for the Proposer’s use and information. All documents can be downloaded and/or printed, as required.
- **“2. Upload Documents:”** Proposal submission documents requested in Appendix B must be uploaded using this tab.
- Note that “3. Commercial Data:”, “4. Technical Data:”, and “5. Pricing Data:” tabs are NOT USED for this event.

Step-by-step instructions for submitting a complete Proposal are provided below:

1. Proposers must upload their Proposal files, including all required forms and files, to submit a complete Proposal. Self-Build, IPP and Affiliates must upload all files before their respective Proposal Due Date (RFP Section 3.1, Table 1, Item 9 for Self-Build and Item 10 for IPP and Affiliates).

2. Submit (upload) one consolidated PDF representing your Proposal via the “2. Upload Documents” tab. That Proposal PDF must abide by the format specified in this Appendix B. A MSWord.docx template that outlines the format of this document is available under the “1. Download Documents” tab for the Proposer’s use. **Response information must be provided in the order, format, and manner specified in this Appendix B and must clearly identify and reference the Appendix B section number that the information relates to.**
 - a. Proposers shall use a filename denoting: CompanyName.pdf.
(example: AceEnergy.pdf)

3. Proposal information that cannot be easily consolidated into the PDF file described in Step 2 (such as large-scale drawing files) or files that must remain in native file format (such as computer models and spreadsheets) shall be **uploaded separately but must be referenced from within the main Proposal PDF file** (e.g., “See AceEnergy_2.5_SiteMap.kmz”). Such additional files must follow the naming convention below:
 - a. File names must include, in order, Company Name, Appendix B section number, and a file descriptor, as shown in the example file name below:
AceEnergy_2.5_SiteMap.kmz
Proposers may use abbreviations if they are clear and easy to follow.

4. Upload files using the "**2. Upload Documents**" tab on the Electronic Procurement Platform.
 - a. For all documents identify the "Document Type" as “Technical Information.” (Do not identify any documents as “Commercial and Administrative” or “Pricing.”)
 - b. "Reference ID" may be left blank.
 - c. Select "Choose File..." Navigate to and choose the corresponding file from your computer. Select "Open" and then "Submit Document."

There is no limit to the number or size of files that can be uploaded. Multiple files may be grouped into a .zip archive for upload. (Any zipped files must still adhere to the naming directions in #3 above.) When successfully uploaded, documents will appear under the "Bid Submissions" section on the bottom of the tab's page, organized within the “Technical Information” Document Type. Repeat steps a, b, and c, as required for each file upload.

If a file with the same name is uploaded twice, the Platform will automatically append a unique numerical extension to the Document Name. To delete a file that has been previously uploaded, click on the “X” button in the “Actions” column for the file to be deleted. Do not upload any files prior to the issuance of the Final RFP.

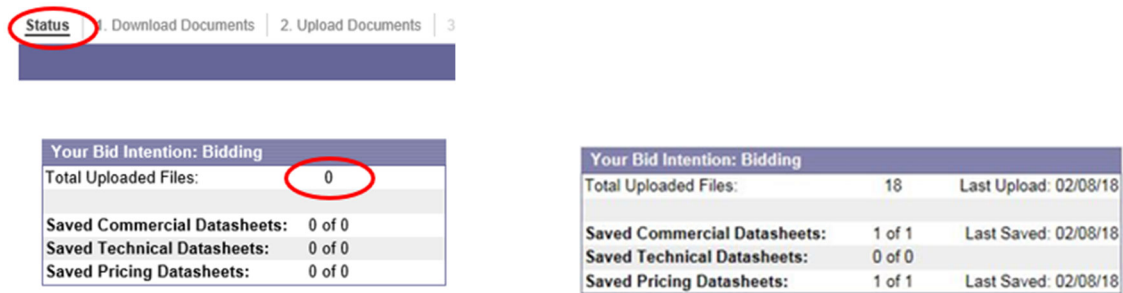
5. The Company will not be responsible for technical problems that interfere with the upload or download of Proposal information. Support is available to answer technical questions about PowerAdvocate’s Sourcing Intelligence from 8 AM to 8 PM Eastern Time (2 AM to 2 PM Hawai‘i Standard Time when daylight savings is in effect) Monday to Friday, except for Holidays posted on the PowerAdvocate website, both by phone (857-453-5800) and by Email (support@poweradvocate.com).

6. Proposers are strongly encouraged to start early and avoid waiting until the last minute to submit the required information. Proposers are allowed to add, modify, and/or delete documents that have been previously submitted any time prior to the event close deadline. For clarity, it is the Proposer’s responsibility to ensure a complete Proposal is uploaded into PowerAdvocate before the Proposal Due Date.
7. Any questions or concerns regarding the RFP may be submitted to the Company Contact via the RFP Email address provided in Section 1.6 of the RFP. Per RFP Section 1.4.2, the Independent Observer will monitor messages within the bid event. Proposers are responsible for following instructions and uploading documents in their appropriate locations. Documents uploaded in the wrong tab will not be considered by the Company.

1.3 PROPOSAL COMPLETION AND CONFIRMATION PROCEDURES

To confirm the submission of all proposal files, in the “Status” tab on the Electronic Procurement Platform, confirm that the “Total Uploaded Files” is the number of expected files to be included in the submission by checking it against your list of submitted files.

Example “Status” tab view:



As stated above in Section 1.2, nothing should be uploaded to the Commercial, Technical, or Pricing Datasheet tabs. Documents uploaded there will not be included in your Proposal submission.

1.3.1 **Proposal Fee Delivery Information.** Provide the Proposal Fee submission information for this Proposal. Include:

- The Date the Proposal Fee was sent.
- The delivery service used and the tracking number for the parcel.
- The U.S.-chartered bank name that issued the cashier’s check and the check number.

2.0 PROPOSAL SUMMARY TABLE

To be filled out completely by IPP or Affiliate Proposers:

1	Proposer Name (Company Name)	
2	Parent Company/Owner/Sponsor/Business Affiliation/etc.	
3	Project Name	
4	Net AC Capacity of the Facility (MW)	
5	Net Energy Potential (NEP) Projection for the Facility (MWh)	
6	Lump Sum Payment (\$/Year)	
7	Project Energy Storage Technology	
8	Energy Storage Capability for the Facility (MW and MWh)	
9	Is the Project capable of being 100% charged from the grid after the 5 year ITC recapture period? (Yes/No)	
10	The Proposer hereby certifies that no single point of failure from the Facility shall result in a decrease in net electrical output greater than 2.2 MW. (Yes/No)	
11	Is the Project grid-forming and black start capable? (Yes/No)	
12	Proposal Guaranteed Commercial Operations Date (MM/DD/YYYY)	
13	The Proposer hereby certifies that the Project meets all performance attributes identified in this Section 2.1 of the RFP? (Yes/No)	
14	The Proposer hereby certifies that the Proposal (including its pricing elements) is not contingent upon changes to existing County, State, or Federal laws or regulations. (Yes/No)	
15	The Proposer hereby agrees to provide Development Period Security and Operating Period Security as set forth in the applicable RDG PPA. (Yes/No)	
16	The Proposer hereby certifies under penalties of perjury that this Proposal has been made in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business partnership, corporation, union, committee, club, or organization, entity, or group of individuals. (Yes/No)	
17	The Proposer hereby certifies that the Proposer, its parent company, or any affiliate of the Proposer has not either defaulted on a current contract with the Company, had a contract terminated by the Company, or has any pending litigation in which the Proposer has made claims against the Company (Yes/No)	
18	Does the Proposer accept the contract terms identified in the RDG PPA in its entirety? (Yes/No)	
18a	If the response to item 18 is “No,” specify the name of the Microsoft Word red-line file that identifies the proposed modifications to the agreement, provided, however, that such proposed modifications shall be limited to targeted revisions to, and not deletions or waivers of, the agreement’s terms, conditions, covenants, requirements or representations.	

To be filled out completely by Self-Build Proposers:

1	Proposer Name (Company Name)		
2	Parent Company/Owner/Sponsor/Business Affiliation/etc.		
3	Project Name		
4	Net AC Capacity of the Facility (MW)		
5	Net Energy Potential (NEP) Projection for the Facility (MWh)		
6	Project Energy Storage Technology		
7	Energy Storage Capability for the Facility (MW and MWh)		
8	Is the Project capable of being 100% charged from the grid after the 5 year ITC recapture period? (Yes/No)		
9	The Proposer hereby certifies that no single point of failure from the Facility shall result in a decrease in net electrical output greater than 2.2 MW. (Yes/No)		
10	Is the Project grid-forming and black start capable? (Yes/No)		
11	Proposal Guaranteed Commercial Operations Date (MM/DD/YYYY)		
12	The Proposer hereby certifies that the Project meets all performance attributes identified in Section 2.1 of the RFP? (Yes/No)		
13	The Proposer hereby certifies that the Proposal (including its pricing elements) is not contingent upon changes to existing County, State or Federal laws or regulations. (Yes/No)		
14	The Proposer hereby agrees to provide Development Period Security and Operating Period Security as set forth in the applicable Model RDG PPA or Model Mid-Tier SFC. (Yes/No)		
15	The Proposer hereby certifies under penalties of perjury that this Proposal has been made in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business partnership, corporation, union, committee, club, or organization, entity, or group of individuals. (Yes/No)		
16	Year (YYYY)	Project Capital Cost (\$)	Extend the table for questions 16, 17, and 18 for as many years as needed up to the 20-year PPA term.
17	Year (YYYY)	O&M Cost (\$)	
18	Year (YYYY)	Annual Revenue Requirement (\$)	

2.1 REQUIRED FORMS ACCOMPANYING PROPOSAL PDF

The following forms must accompany each proposal, must be attached to the Proposal PDF, and uploaded via the “2. Upload Documents” tab:

- Document signed by a representative for the Proposer **authorizing the submission** of the Proposal
- Fully executed **Mutual Confidentiality and Non-Disclosure Agreement (“NDA”)** ([Appendix E](#) to the RFP, may be downloaded from the “1. Download Documents” tab in the Electronic Procurement Platform) or fully executed **NDA** for the Request for Proposal for Variable Renewable Dispatchable Generation Paired with Energy Storage, Island of Lāna‘i, dated November 29, 2019.
- **Certificate of Vendor Compliance** for the Proposer
 - **Certificate of Good Standing** for the Proposer and **Federal and State tax clearance certificates** for the Proposer may be provided in lieu of the Certificate of Vendor Compliance
- **Certification of Counsel for Proposer**, if applicable. (See [Appendix B Attachment 1](#).)
- Completed applicable **Project Interconnection Data Request worksheet** for the proposed technology and **project single line diagram(s)**. **Models for equipment and controls, list(s)** identifying components and **respective files** (for inverters and power plant controller), and **complete documentation with instructions** as specified in the Data Request worksheet shall be submitted within the respective timeframes specified in [Section 5.1](#) of the RFP.² (See [Section 2.11.1](#) below)
- [For Self-Build Only] **Self-Build Option Team Certification Form**. See [Appendix G Attachment 1](#).
- [For Self-Build Only] **Revenue Requirements Worksheets** that support the annual revenue requirements estimates shall be submitted. A starter revenue requirements template file can be requested by the Self-Build Team via email to the RFP Email Address or through the PowerAdvocate Messaging function once the RFP event opens. The revenue requirements worksheets submitted will be modified to reflect the details of the Project’s Proposal. All assumptions used will be reflected in an assumptions input tab.

2.2 PROPOSAL SUMMARY/CONTACT INFORMATION

2.2.1 Provide a **primary point of contact** for the Proposal being submitted:

- Name
- Title
- Mailing Address
- Phone Number
- Email Address - this will be the official communication address used during the RFP process

2.2.2 **Executive Summary of Proposal.** The executive summary must include an approach and description of the important elements of the Proposal.

² If the Models, lists, respective files and complete documentation are not submitted with the Proposal upload, they shall be submitted via PowerAdvocate’s Messaging as attachments within the respective timeframes specified in [Section 5.1](#) of the RFP.

2.2.3 **Pricing information.** Pricing information must be filled out in the Section 2.0 Proposal Summary Table above. Provide any pricing information only in those table sections – do not embed pricing information in any other portion of the Proposal PDF.

2.2.4 Provide a **high-level overview of the proposed Facility**, including at a minimum the following information:

- Facility Generation Size (MW_{AC} and MW_{DC})
- Net Maximum Output Capacity of the Facility at the Point of Interconnection (MW_{AC})
- Technology Type
- Number of Generators
- Rated Output of each Generator
- Generator Facility Design Characteristics

For Storage Component:

- Technology Type (i.e. lithium ion battery)
- Maximum Rated Output, as defined in the applicable contract (MW)
- Discharge Duration at Maximum Rated Output (hours)
- Storage Energy Capacity (MWh) available at the point of interconnection (i.e. BESS Contract Capacity as defined in the applicable contract)
- Operational Limitations, such as, but not limited to: grid charging limits (with respect to ITC), energy throughput limits (daily, monthly, annually), State of Charge restrictions (min/max SOC while at rest (not charging/discharging)), etc. Proposed Operational Limits cannot be in conflict with the energy discharge requirement in Sections 1.2.10 and 1.2.11 of the RFP. If such a conflict is identified, the Proposal may be disqualified.
- Round Trip Efficiency (“RTE”) Specify a single value (percentage) that the Facility is required to maintain throughout the term of the applicable contract. The RTE must consider and reflect:
 - the technical requirements of the Facility (as further set forth in the applicable contract);
 - that the measurement location of charging and discharged energy is at the point of interconnection;
 - electrical losses associated with the point of interconnection measurement location;
 - any auxiliary and station loads that need to be served by BESS energy during charge and discharge that may not be done at Maximum Rated Output or over a fixed duration; and
 - that the data used to validate the RTE will be captured during a full charge cycle (0%-100% SOC) directly followed by a full discharge cycle (100%-0% SOC).
- Describe any augmentation plans for the storage component to maintain the functionality and characteristics of the storage during the term of the applicable contract. Include any expected interval of augmentation (months/years).
- Estimated useful life of the storage component (including augmentation if used) (years).

2.3 FINANCIAL

Provide the following financial information identified below. As specified in the General Instructions in Section 1.0 above, all information (including attachments) must be provided in English, be provided in U.S. Dollars and use U. S. credit ratings.

2.3.1 Identification of Equity Participants

2.3.1.1 Who are the **equity participants** in the Project (or the equity partners' other partners)?

2.3.1.2 Provide an **organizational structure** for the Proposer including any general and limited partners and providers of capital that identifies:

- Associated responsibilities from a financial and legal perspective
- Percentage interest of each party

2.3.2 Project Financing

2.3.2.1 **How will the Project be financed** (including construction and term financing)? Address at a minimum:

- The Project's projected financial structure
- Expected source of debt and equity financing

2.3.2.2 [For IPP and Affiliate Proposals] Identify all **estimated development and capital costs** for, at a minimum:

- Equipment
 - Identify the manufacturer and model number for all major equipment
- Construction
- Engineering
- Seller-Owned Interconnection Facilities
- Company-Owned Interconnection Facilities
- Land
- Annual O&M
- Specify a percentage of the total project cost that is estimated to be attributed to the storage functionality of the Facility. As the storage functionality is treated as a lease, the Company will use the percentage for its preliminary calculation of the lease liability only. This percentage requested for the Company's accounting purposes does not affect nor alter the liquidated damage provisions of the PPA, as those provisions reflect the benefit the Company seeks from the Project's storage functionality.

[For Self-Build Only] Identify all **estimated development and capital costs** for, at a minimum:

- Facility (including any generation and storage components)
- Outside Services
- Interconnection
- Overhead Costs
- Allowance for Funds Used During Construction
- Annual O&M
- Specify a percentage of the total project cost that is estimated to be attributed to the storage functionality of the Facility. As the storage functionality is treated as a lease, the Company will use the percentage for its preliminary calculation of the lease liability only. This percentage requested for the Company's accounting purposes does not affect nor alter the liquidated damage

- provisions of the RDG PPA, as those provisions reflect the benefit the Company seeks from the Project's storage functionality.
- 2.3.2.3 Discuss and/or provide **supporting information on any project financing guarantees**.
- 2.3.2.4 Describe any **written commitments obtained from the equity participants**.
- 2.3.2.5 Describe any **conditions precedent to project financing**, and the Proposer's plan to address them, other than execution of the Power Purchase Agreement or any other applicable project agreements and State of Hawai'i Public Utilities Commission approval of the Power Purchase Agreement and other agreements.
- 2.3.2.6 Provide any **additional evidence to demonstrate that the Project is financeable**.
- 2.3.3 Project Financing Experience of the Proposer
Describe **the project financing experience of the Proposer** in securing financing for projects of a similar size (i.e., no less than two-thirds the size) and technology as the one being proposed including the following information for any referenced projects:
- Project Name
 - Project Technology
 - Project Size
 - Location
 - Date of Construction and Permanent Financing
 - Commercial Operations Date
 - Proposer's Role in Financing of the Project
 - Off-taker
 - Term of the Interconnection Agreement
 - Financing Structure
 - Major Pricing Terms
 - Name(s) of Finance Team Member(s); Time (i.e., years, months) worked on the project and Role/Responsibilities
- 2.3.4 Evidence of the Proposer's Financial Strength
- 2.3.4.1 Provide **copies of the Proposer's audited financial statements** (balance sheet, income statement, and statement of cash flows):
- Legal Entity
 - Three (3) most recent fiscal years
 - Quarterly report for the most recent quarter ended
 - Parent Company
 - Three (3) most recent fiscal years
 - Quarterly report for the most recent quarter ended
- 2.3.4.2 Provide the **current credit ratings** for the Proposer (or Parent Company, if not available for Proposer), affiliates, partners, and credit support provider:
- Standard & Poor's

- Moody's
- Fitch

2.3.4.3 Describe any **current credit issues** regarding the Proposer or affiliate entities raised by rating agencies, banks, or accounting firms.

2.3.4.4 Provide any **additional evidence that the Proposer has the financial resources and financial strength** to complete and operate the Project as proposed.

2.3.5 Provide evidence that the Proposer can provide the required securities

2.3.5.1 Describe the Proposer's **ability (and/or the ability of its credit support provider) and proposed plans to provide the required securities** including:

- Irrevocable standby letter of credit
- Sources of security
- Description of its credit support provider

2.3.6 Disclosure of Litigation and Disputes

Disclose any **litigation, disputes, and the status of any lawsuits or dispute resolution** related to projects owned or managed by the Proposer or any of its affiliates.

2.3.7 State to the best of the Proposer's knowledge: Will the Project result in **consolidation** of the Developer entity's finances onto the Company's financial statements under FASB 810. **Provide supporting information** to allow the Company to verify such conclusion.

2.4 CONTRACT EXCEPTIONS AND FINANCIAL COMPLIANCE

2.4.1 If Proposers elect to propose modifications to the RDG PPA, **provide a Microsoft Word red-line version of the RDG PPA** identifying specific proposed modifications to the model language that the Proposer is agreeable to and a detailed explanation and supporting rationale for each modification. General comments, drafting notes, and footnotes such as "parties to discuss" are unacceptable and will be considered non-responsive.

Proposers that do not upload redlines of the applicable RDG PPA with their Proposal submission will be deemed to have accepted the RDG PPA in its entirety. If no modifications are proposed, please state in this section "no modifications to the RDG PPA".

As set forth in RFP Section 3.8.5.1, proposed modifications to the RDG PPA will be subject to negotiation between the Company and the Final Award Group and should not be assumed to have been accepted either as a result of being selected to the Final Award Group or based on any previously executed PPA.

2.5 PŪLAMA SITE INFORMATION

2.5.1 Provide a **site layout plan** which illustrates:

- Proposed location of all equipment
- Proposed location of all facilities on the Pūlama Site, including any proposed line extensions

- Site boundaries (if the proposed Project does not cover the entire Pūlama Site)

2.5.2 Describe the **Interconnection route** and include:

- Site sketches of how the facility will be interconnected to the Company's System (above-ground and/or underground)
- Description of the rationale for the interconnection route

2.6 ENVIRONMENTAL COMPLIANCE AND PERMITTING PLAN

Scoring of proposals for the non-price evaluation criteria of this section will be based on the completeness and thoroughness of responses to each of the criteria listed below. The Company recommends that each Proposal incorporate the list below as an outline together with complete and thorough responses to each item in the list. Proposals that closely follow this recommendation will typically be awarded higher scores than proposals that do not.

2.6.1 Describe your **overall land use and environmental permits and approvals strategy** and approach to obtaining successful, positive results from the agencies and authorities having jurisdiction, including:

- Explanation of the conceptual plans for siting
- Studies/assessments
- Permits and approvals
- Gantt format schedule which identifies the sequencing of permit application and approval activities and critical path. (Schedule must be in MM/DD/YY format.)

2.6.2 Discuss the **city zoning and state land use classification**:

- Identify present and required zoning and the ability to site the proposed Project within those zoning allowances.
- Identify present and required land use classifications and the ability to site the proposed Project within those classifications.
- Provide evidence of proper zoning and land use classifications for selected site and interconnection route.
- If changes in the above are required for the proposed Project, provide a plan and timeline to secure the necessary approvals.

2.6.3 Identify all required discretionary and non-discretionary **land use, environmental and construction permits, and approvals** required for development, financing, construction, and operation of the proposed Project, including but not limited to zoning changes, Environmental Assessments, and/or Environmental Impacts Statements.

Provide a **listing of such permits and approvals** indicating:

- Permit Name
- Federal, State, or Local agencies and authorities having jurisdiction over the issuance
- Status of approval and anticipated timeline for seeking and receiving the required permit and/or license
- Explanation of your basis for the assumed timeline

- Explain any situation where a permit or license for one aspect of the Project may influence the timing or permit of another aspect (e.g., a case where one permit is contingent upon completion of another permit or license), if applicable.
- Explain your plans to secure all permits and approvals required for the Project.

2.6.4 Provide a **preliminary environmental assessment of the site** (including any pre-existing environmental conditions) and potential short- and long-term **impacts** associated with, or resulting from, the proposed Project – including direct, indirect, and cumulative impacts associated with development, construction, operation, and maintenance of the proposed Project in every area identified below. Discuss if alternatives have been or will be considered. The assessment shall also include Proposer’s short- and long-term plans to mitigate such impacts and explanation of the mitigation strategies for, but not limited to, each of the major environmental areas as presented below:

- Natural Environment
 - Air quality
 - Biology (Natural habitats and ecosystems, flora/fauna/vegetation, and animals, especially if threatened or endangered)
 - Climate
 - Soils
 - Topography and geology
- Land Regulation
 - Land Uses, including any land use restrictions and/or pre-existing environmental conditions/contamination
 - Flood and tsunami hazards
 - Noise
 - Roadways and Road and Air Traffic
 - Utilities
- Socio-Economic Characteristics
- Aesthetic/Visual Resources and Impact
- Solid Waste
- Hazardous Materials
- Water Quality
- Public Safety Services (Police, Fire, Emergency Medical Services)
- Recreation
- Potential Cumulative and Secondary Impacts

2.6.5 Provide a **decommissioning plan**, including:

- Developing and implementing program for recycling to the fullest extent possible, or otherwise properly disposing of installed infrastructure, if any, and
- Demonstrating how restoration of the Site to its original ecological condition is guaranteed in the event of default by the Proposer in the applicable Site Control documentation.

2.7 CULTURAL RESOURCE IMPACTS

2.7.1 Provide a **proposal to ensure cultural sites are identified and carefully protected** as part of a cultural impact plan as it pertains to the Project Site and interconnection route. This proposal must include at a minimum:

- An initial analysis that identifies:

- 1) valued cultural, historical, or natural resources in the area in question, including the extent to which traditional and customary native Hawaiian rights are exercised in the area;
 - 2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and
 - 3) the feasible action, if any, to be taken to reasonably protect any identified cultural, historical, or natural resources in the area in question, and the reasonable protection of traditional and customary native Hawaiian rights in the affected area.
- Proposer’s experience with cultural resource impacts on past projects
 - Consultant’s experience with cultural resource impacts on past projects (name, firm, relevant experience)
 - Status of the cultural impact plan (including, but not limited to: Cultural Impact Assessment, Cultural Landscape Study, Cultural Resource Management Plan, Ethnographic Survey, Consultation on Section 106 Process, and/or Traditional Cultural Property Studies)

2.8 COMMUNITY OUTREACH

Gaining community support is an important part of a Project’s viability and success. An effective Community Outreach Plan will call for early meaningful communications with stakeholders and will reflect a deep understanding and respect for the community’s desire for information. The public meeting and comment solicitation process described in Section 5.3 of the RFP is intended to support that premise and the Commission’s desire to increase bid transparency within the RFP process. When developers neglect to demonstrate transparency and a willingness to engage in early and frequent communication with Hawaii’s communities, costly and timely challenges to their projects have resulted. In some instances, projects have failed. Incorporating transparency during the competitive bidding phase may seem unconventional, but it has become an essential community expectation. Developers must share information and work with communities to address concerns through careful listening, thoughtful responsiveness, and a commitment to respect the environmental and cultural values of Hawai‘i.

2.8.1 Provide a **detailed Community Outreach Plan** to work with and inform neighboring communities and stakeholders and to provide them timely information during all phases of the Project. The plan shall address, but not be limited to, the following items:

- Project description
- Community scoping
- Project benefits
- Government approvals
- Development process
- Identification of communities and other stakeholders that may be affected by the proposed Project:
 - How will they be affected?
 - What mitigation strategies will the Proposer implement?
- Comprehensive communication strategy with affected communities and the general public regarding the proposed Project:
 - Describe frequency of communication
 - Provide source of information
 - Identify communication outlets

- Describe opportunities, if any, for affected communities and general public to provide the developer with feedback and comments on the proposed Project

Proposers are reminded of RFP Section 3.4.2 including Proposals must provide all referenced material if it is to be considered during the Proposal evaluation.

2.8.2 Provide any **documentation of local community support or opposition** including any letters from local organizations, newspaper articles, or communications from local officials.

2.8.3 Provide a **description of community outreach efforts** already taken or currently underway, including the names of organizations and stakeholders contacted about the proposed Project.

2.8.4 Describe any anticipated or negotiated investment in the community and other **community benefits** that the Proposer proposes to provide in connection with the Project, along with an estimated value of the community benefits in dollars (including the cost to Proposers providing the benefits and supporting details on how those costs and benefits were derived).

2.8.5 Proposer selected to the Final Award Group must display the below table of information on their website described in Section 5.3 to provide communities Project information that is of interest to them in a standard format. All information in this table must be included in all community presentations in addition to the Proposer’s project website.

PROJECT SUMMARY AND COMMUNITY OUTREACH PLAN

*	Proposer Name (Company name)	
*	Parent Company/Owner/Sponsor/Business Affiliate/etc.	
*	Project Name	
*	Net AC Capacity of the Facility (MW) (must match Proposal information)	
*	Proposed Facility Location, Street Address if available, or what City/Area on the island it is near	
*	TMK(s) of Facility Location (must match Proposal information)	
*	Point of Interconnection’s Circuit (must match Proposal information)	
*	Project Description (in 200 words or less)	<i>(A description that includes information about the project that will enable the community to understand the impact that the Project might have on the community.)</i>
*	Project site map	<i>(provide a map similar to what was provided in Section 2.5.2)</i>
*	Site layout plan	<i>(provide a layout similar to what was provided in Section 2.5.3)</i>

*	Interconnection route	<i>(provide a map of the route similar to what was provided in Section 2.5.4)</i>
Environmental Compliance and Permitting Plan		
*	Overall land use and environmental permits and approvals strategy	<i>(provide information in level of detail as provided in Section 2.6.1)</i>
*	Gantt format schedule which identifies the sequencing of permit applications and approval activities and critical path. Schedule must be in MM/DD/YY format)	<i>(provide information in level of detail as provided in Section 2.6.1)</i>
*	City Zoning and Land Use Classification	<i>(provide information in level of detail as provided in Section 2.6.2)</i>
*	Discretionary and non-discretionary Land use, environmental and construction permits and approvals	<i>(provide information in level of detail as provided in Section 2.6.3)</i>
*	Listing of Permits and approvals	<i>(provide information in level of detail as provided in Section 2.6.3)</i>
*	Preliminary environmental assessment of the Site (including any pre-existing environmental conditions)	<i>(provide information in level of detail as provided in Section 2.6.4)</i>
Cultural Resource Impacts		
*	Proposer's updated Community Outreach Plan must include a plan that (1) identifies any cultural, historic or natural resources that will be impacted by the Project (2) describes the potential impacts on these resources and (3) identifies measures to mitigate such impacts.	<i>(provide information in level of detail as provided in Section 2.7)</i>
Community Outreach		
*	Detailed Community Outreach Plan	<i>(provide key information from Community Outreach Plan as specified in Section 2.8.1 or provide a link to updated comprehensive Community Outreach Plan)</i>
*	Local community support or opposition	<i>(provide latest comprehensive information)</i>
*	Community outreach efforts	<i>(provide latest comprehensive information)</i>
*	Community benefits	<i>(provide latest comprehensive information)</i>

2.9 OPERATIONS AND MAINTENANCE (O&M)

2.9.1 To demonstrate the long-term operational viability of the proposed Project, describe the **planned operations and maintenance**, including:

- Operations and maintenance funding levels, annually, throughout the term of the contract.
- Description of the operational requirements by frequency (daily, weekly, monthly, yearly, as-necessary, run hour interval) and maintenance requirements by frequency (daily, weekly, monthly, yearly, as-necessary, run hour interval).
- A discussion of the staffing levels proposed for the Project and location of such staff. If such staff is offsite, describe response time and ability to control the Project remotely.
- Technology specific maintenance experience records.
- Identification of any O&M providers.
- The expected role of the Proposer (Owner) or outside contractor.
- Scheduling of major maintenance activity.
- Plan for testing equipment.
- Estimated life of Generation and/or Storage Facilities and associated Interconnection Facilities.
- Safety plan, including historical safety records with environmental history records, violations, and compliance plans.
- Security plan.
- Site maintenance plan.
- Substation equipment maintenance plan.

2.9.2 State whether the Proposer would **consider 24-hour staffing**. Explain how this would be done.

2.9.3 Describe the **Proposer's contingency plan**, including the Proposer's mitigation plans to address failures. Such information should be described in the Proposal to demonstrate the Project's reliability with regard to potential operational issues.

2.9.4 Describe if the Proposer will **coordinate their maintenance schedule** for the Project with the Company's annual planned generation maintenance. See Article 5 of the RDG PPA.

2.9.5 Describe the **status of any O&M agreements or contracts** that the Proposer is required to secure. Include a discussion of the Proposer's plan for securing a long-term O&M contract.

2.9.6 Provide **examples of the Proposer's experience** with O&M services for other similar projects.

2.10 PERFORMANCE STANDARDS

2.10.1 Design and operating information. Provide a **description of the project design**. Description shall include:

- Configuration description, including conceptual or schematic diagrams. Overview of the Facility Control Systems – central control and inverter- or resource-level control.
- Diagrams approved by a Professional Electrical Engineer registered in the State of Hawai'i, indicated by the presence of the Engineer's Professional seal on all drawings and documents. Including but not limited to:

- A single-line diagram, relay list, trip scheme and settings of the generating facility, which identifies the Point of Interconnection, circuit breakers, relays, switches, synchronizing equipment, monitoring equipment, and control and protective devices and schemes.

2.10.1.1 Provide the projected **hourly annual energy potential production profile of the Facility**³ (24 hours x 365 days, 8760 generation profile) for the provided NEP RFP Projection.

2.10.1.2 Provide the **sample rate of critical telemetry** (i.e., frequency and voltage) based on inputs to the facility control systems.

2.10.1.3 Provide a description of the Facility's **capability to be grid-forming and have black-start capability**.

2.10.1.4 Provide the explanation of the methodology and underlying **information used to derive the Project's NEP RFP Projection**, including the preliminary design of the Facility and the typical meteorological year file used to estimate the Renewable Resource Baseline, as required in Article 6.6 of the RDG PPA. The explanation of the methodology should include, but not be limited to, the long-term resource data used, the gross and net generation MWh, and assumptions (loss factors, uncertainty values, any grid or project constraints).

2.10.2 **Capability of Meeting Performance Standards.** The proposed Facility must meet the performance attributes identified in Section 2.1 of the RFP. Provide **confirmation that the proposed Facility will meet the requirements identified** or provide clarification or comments about the Facility's ability to meet the performance standards. Proposals should include sufficient documentation to support the stated claim that the Facility will be able to meet the Performance Standards. The Proposal should include information required to make such a determination in an organized manner to ensure this evaluation can be completed within the evaluation review period.

2.10.3 **Reactive Power Control:** Provide the facility's **ability to meet the Reactive Power Control capabilities**, including Voltage Regulation at the point of interconnection, required in the Performance Standards, including contribution from the inverters of generation and/or storage and means of coordinating the response. Provide the inverter capability curve(s). Confirm ability to provide reactive power at zero active power.

2.10.4 **Ramp Rate** for Generation Facilities: Confirm the ability to meet the ramp rate requirement specified in the RDG PPA.

2.10.5 **Undervoltage ride-through:** Provide the facility's terminal voltage level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.6 **Overvoltage ride-through:** Provide the facility's terminal voltage level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to

³ The projected hourly annual energy production profile is the projected output from the generating facility without curtailment and before any energy is directed to an energy storage component.

meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.7 **Transient stability ride-through:** Provide the facility's ability to stay online during Company System: (1) three-phase fault located anywhere on the Company System and lasting up to __ cycles; and (2) a single line to ground fault located anywhere on the Company System and lasting up to __ cycles. Provide the Facility's ability to withstand subsequent events.

2.10.8 **Underfrequency ride-through:** Provide the facility's terminal frequency level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.9 **Overfrequency ride-through:** Provide the facility's terminal frequency level(s) and elapsed time at which the facility will disconnect from the utility system during the disturbance, if any. Confirm the ability to meet ride-through requirements and include supporting documentation regarding inverter design, control parameters, etc.

2.10.10 **Frequency Response:** Provide the facility's frequency response characteristics as required by the RDG PPA, including time of response, tunable parameters, alternate frequency response modes, and means of implementing such features.

2.10.11 **Auxiliary Power Information:** Proposer must provide the maximum auxiliary power requirements for:

- Start-up
- Normal Operations (from generator)
- Normal Operating Shutdown
- Forced Emergency Shutdown
- Maintenance Outage

2.10.12 **Coordination of Operations:** Provide a description of the control facilities required to coordinate generator operation with and between the Company's System Operator and the Company's System.

- Include a description of the equipment and technology used to facilitate dispatch to the Company and communicate with the Company.
- Include a description of the control and protection requirements of the generator and the Company's System.

2.10.13 **Cycling Capability:** Describe the Facility's ability to cycle on/off and provide limitations.

2.10.14 **Active Power Control Interface:** Describe the means of implementing active power control and the Power Possible, including the contribution to the dispatch signal from paired storage, if any. Provide the Proposer's **experience** dealing with active power control, dispatch, frequency response, and ride-through.

2.10.15 Provide the details of the **major equipment** (i.e., batteries, inverters, battery management system), including, but not limited to, name of manufacturer, models, key metrics, characteristics of the equipment, and performance specifications.

2.10.16 **Energy Storage performance standards:** Provide additional performance standard descriptions as follows:

- MWh storage output for a full year
- Ramp Rate: Provide the Facility's ramp rate, which should be no more than 2 MW/minute for all conditions other than those under control of the Company System Operator and/or those due to desired frequency response.
- System Response Time – Idle to Design Maximum (minutes)
- Discharge Start-up time (minutes from notification)
- Charge Start-up time (minutes from notification)
- Start and run-time limitations, if any
- Ancillary Services provided, if any (i.e., Spinning Reserves, Non-Spinning Reserves, Regulation Up, Regulation Down, Black Start capability, other)

2.10.17 Provide the description and details of the **grid-charging capabilities of the Facility**. Include a description on the ability to control the charging source.

2.11 INTERCONNECTION SUBMITTAL REQUIREMENTS

2.11.1 A summary of the model requirements and impact study scope can be found in Appx B Att 6 from the "1. Download Documents" tab.

2.11.2 Provide the completed **Project Interconnection Requirement Study Data Request worksheet** for the proposed technology with the Proposal submission. (The form can be found in the "1. Download Documents" tab as Appx B Att 2 Project Interconnection Data Request Worksheet (PV Generation) MS Excel file.) Also provide all **project single line diagram(s)** with the Proposal submission. **Models for equipment and controls, list(s)** identifying components and **respective files** (for inverters and power plant controller), and **complete documentation with instructions** shall be submitted within the timeframes specified in Section 5.1 of the RFP. Proposers may also download the PSCAD model requirements memo labelled as Appx B Att 3 from the "1. Download Documents" tab.

2.12 PROVEN TECHNOLOGY

2.12.1 Provide all supporting information for the Company to assess the **commercial and financial maturity of the technology** being proposed. Provide any supporting documentation that shows examples of projects that:

- Use the technology at the scale being proposed
- Have successfully reached commercial operations (for example, by submitting a PPA)
- Demonstrate experience in providing Active Power dispatch

2.13 EXPERIENCE AND QUALIFICATIONS

Proposers, its affiliated companies, partners, and/or contractors and consultants are required to demonstrate project experience and management capability to successfully develop and operate the proposed Project.

2.13.1 Provide a hierarchical **organizational / management chart** for the Project that lists all key personnel and project participants dedicated to this Project and that identifies the management structure and responsibilities. In addition to the chart, Proposers must provide biographies / resumes of the key personnel, including position, years of relevant experience and similar project experience. Proposers must provide specifics as they relate to financing of renewable energy projects. Identify architects and engineers or provision to provide same that are licensed to practice in the State of Hawaii. Providers must also provide a completed table:

- For each of the project participants (including the Proposer, partners, and proposed contractors), fill out the table below and provide statements that list the specific experience of the individual in: financing, designing, constructing, interconnecting, owning, operating, and maintaining renewable energy generating or storage facilities, or other projects of similar size and technology, and
- Provide any evidence that the project participants have worked jointly on other projects.

Participant Name:	EXPERIENCE:						
	Financing	Designing	Constructing	Interconnecting	Owning	Operating	Maintaining
1.							
2.							
3.							
...							

2.13.2 Identify those **member(s) of the team** the Proposer is submitting to meet the experience and qualifications requirement, including the Threshold Requirement. Identify those **members of the team with experience and qualifications**, including affiliates, and their principal personnel who will be involved in the project. If the Proposer consists of multiple parties, such as joint ventures or partnerships, demonstrate each member(s) firm commitment to provide services to the project (e.g., letter of intent); provide this information for each party, clearly indicating the proposed role of each party, including an ownership chart indicating direct and indirect ownership, and percentage interests in the partnership or joint venture.

2.13.3 Provide a **listing in the table format below, of all renewable energy generation or energy storage projects** the Proposer has successfully developed or that are currently under construction. Describe the Proposer’s role and responsibilities associated with these projects (lead developer, owner, investor, etc.). Provide the following information as part of the response:

Project Name	Location (City, State)	Technology (wind, PV, hydro, plus storage, etc.)	Size (MW/ MWh)	Commercial Operation Date	Offtaker (if applicable)	Role & Responsibilities
1.						
2.						
3.						
...						

2.14 STATE OF PROJECT DEVELOPMENT AND SCHEDULE

2.14.1 Provide a **project schedule in GANTT chart format** with complete **critical path activities** identified for the Proposal from the Notice of Selection of the Proposal to the start of Commercial Operations.

- The **schedule** must include:
 - Interconnection Requirement Study (IRS) assumptions
 - Anticipated contract negotiation period assumptions
 - Regulatory assumptions
 - Anticipated submittal and approval dates for permitting (including but not limited to environmental and archaeological compliance)
 - Cultural Resource implications and mitigation activities
 - Community outreach and engagement activities
 - Energy resource assessment
 - Financing
 - Engineering
 - Procurement
 - Facility construction including construction management events
 - Applicable reporting milestone events specified in the RDG PPA
 - Testing
 - Interconnection (including engineering, procurement, and construction)
 - Commercial Operations Date
 - All other important elements outside of the direct construction of the Project
- For each project element, list the start and end date (must be in MM/DD/YY format), and include predecessors to clearly illustrate schedule dependencies and durations.
- Proposers must also list and describe critical path activities and milestone events, particularly as they relate to the integration and coordination of the project components and the Company's Electric System. Proposers must ensure that the schedule provided in this section is consistent with the milestone events contained in the RDG PPA and/or other agreements.

2.14.2 Describe the **construction execution strategy** including:

- Identification of contracting/subcontracting plans
- Modular construction
- Safety plans⁴
- Quality control and assurance plan
- Labor availability
- Likely manufacturing sites and procurement plans
- Similar projects where these construction methods have been used by the Proposer.

2.14.3 Provide a description of any **project activities that have been performed to date**.

2.14.4 Explain how you plan to reach **safe harbor milestones** (if applicable) and **guaranteed commercial operations**, including durations and dependencies which support this achievement.

⁴ A document that describes the various safety procedures and practices that will be implemented on the Project and how applicable safety regulations, standards, and work practices will be enforced on the Project.

3.0 PROPOSED CBRE PROGRAM

Provide a detailed description of the CBRE program that will be offered to eligible subscribers, including at a minimum, but not limited to, a discussion of the following:

- Financing Options
 - Subscriber fees and payments
 - Upfront payments
 - Ongoing payments
 - Public funding options
 - Extent to which subscribers will be financially responsible for any facility underperformance
- Percentage of the project’s capacity that will be available to subscribers vs. unsubscribed capacity
 - Commitments to residential Subscribers
 - Commitments to Low- and Moderate- Income Customers (“LMI Customers”)
- Marketing or outreach plans to advertise the proposed project/program to LMI (if applicable) and non-LMI eligible customers
- Strategies for LMI (if applicable) and non-LMI customer retention and maintaining LMI (if applicable) and non-LMI customer participation levels
- Estimated benefits to LMI (if applicable) and non-LMI customer participants
 - Expected savings
 - Payback periods
 - Payback mechanisms
 - Other benefits
- Prior experience, specifically relating to community-based renewable energy projects
- Plans for CBRE program administration

**Certification of Counsel for Proposer
Hawaiian Electric Company, Inc., Maui Electric Company, Ltd, and Hawai'i Electric
Light Company, Inc.**

Pursuant to Section 1.7.4 of Hawaiian Electric Company, Inc., Hawai'i Electric Light Company, Inc. and Maui Electric Company, Limited's (each a "Company" and collectively, the "Companies") Request For Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Island of Maui ("RFP"), the Companies may require legal counsel who represent multiple unaffiliated proposers to sign a certification that they have not shared confidential information obtained through the representation of one proposer with any other unaffiliated proposer.

Accordingly, by signing below, I hereby acknowledge, agree and certify that:

(1) in connection with the RFP, I represent the following company that has submitted a proposal(s) for the RFP: _____ ("Proposer");

(2) irrespective of any proposer's direction, waiver or request to the contrary, I will not share a proposer's confidential information or the Company's confidential information associated with such proposer, including, but not limited to, a proposer's or Company's negotiating positions, with third parties unaffiliated with Proposer (by contract or organizational structure), including other proposers responding to the RFP;

(3) the Companies may rely on this certification for purposes of the RFP; and

(4) at the conclusion of power purchase agreement negotiations, if any, the Company may require me to sign a certificate certifying that I have not shared a proposer's confidential information or the Company's confidential information associated with such proposer, including, but not limited to, a proposer's or Company's negotiating positions, with third parties unaffiliated with Proposer (by contract or organizational structure), including other proposers responding to the RFP.

Name (print)

Law Firm (if applicable)

Signature

Date

Section 1.7.4 of the RFP provides in relevant part that:

In submitting a Proposal in response to this RFP, each Proposer certifies that the Proposal has been submitted in good faith and without fraud or collusion with any other unaffiliated person or entity. The Proposer shall acknowledge this in the Response Package submitted with its Proposal. Furthermore, in executing the NDA provided as Appendix E, the Proposer agrees on behalf of its Representatives (as defined in the NDA) that the Company's negotiating positions will not be shared with other Proposers or their respective Representatives.

In addition, in submitting a Proposal, a Proposer will be required to provide Company with its legal counsel's written certification in the form attached as Appendix B Attachment 1 certifying in relevant part that irrespective of any proposer's direction, waiver, or request to the contrary, that the attorney will not share a proposer's confidential information associated with such Proposer with others, including, but not limited to, such information such as a Proposer's or Company's negotiating positions. If legal counsel represents multiple unaffiliated proposers whose Proposals are selected for the Final Award Group, such counsel will also be required to submit a similar certification at the conclusion of power purchase agreement negotiations that he or she has not shared a proposer's confidential information or the Company's confidential information associated with such Proposer with others, including but not limited to, such information as a Proposer's or Company's negotiating positions.

**Project Interconnection - Data Request
FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

	Response
1) Please provide a plan map of the Renewable Generation facility. Please indicate the interconnection point to the HECO system.	
2) Please provide the following generation and load information for the Renewable Generation facility:	
a. Gross and net output of the facility	
b. Expected KW and KVAR loads including, but not limited to, generators' auxiliary load curve, process load(s) profile(s), etc.	
c. Expected minimum and maximum MW and MVAR "import from" AND "export to" HECO.	
3) Please provide Single-Line Diagram(s), Three-Line Diagram(s), and Protective Relay List & Trip Schedule for the generation and interconnection facilities:	
a. The Single-line diagram(s) and Three-line diagram (s) should include:	
i. For main and generator step up transformer(s), please show:	
• Transformer voltage and MVA ratings.	
• Transformer impedance(s).	
• Transformer winding connections and grounding. If neutrals are grounded through impedance, please show the impedance value.	
ii. The protective relaying and metering for the generators, transformers, buses, and all other main substation equipment.	
iii. For the potential transformers, please indicate the type, quantity, ratio, and accuracy rating.	
iv. For the current transformers, please indicate the type, quantity, ratio, and accuracy rating, and thermal rating factor.	
v. Auxiliary power devices (e.g. capacitors, reactors, storage systems, etc.) and their rating(s); additional inquiries may be made to obtain technical data for these devices.	
vi. For the interconnection / tie lines (overhead or underground) and the plant's generation system, please provide the following, as applicable:	
• Installation details such as cross-section(s), plan and profiles, etc.	
• Conductor data such as size, insulation, length etc.	
• Continuous and emergency current ratings.	
• Voltage rating (nominal and maximum KV).	
• BIL rating.	
• Positive, negative, and zero-sequence impedances (resistance, reactance, and susceptance)	
• Capacitance or charging current.	
• Short-circuit current capability.	
vii. Include station power for facility and all applicable details.	
viii. All applicable notes pertaining to the design and operation of the facility.	
b. The Protective relay list & trip schedule should list the protected equipment; the relay description, type, style number, quantity, ANSI Device No., and range; and the breaker(s)/switching device(s) tripped, for both the generator protection and the interconnection facilities protection.	
c. Please provide both a paper and an electronic version (e.g. dgn, dxf, or pdf) of the single-line diagram(s) and the protective relay list & trip schedule.	
d. Single-line diagrams should be provided for both the generation plant and the interconnection substation.	

**Project Interconnection - Data Request
 FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

	Response
4) For the PV Inverter Based Generating Facility, please provide the following data:	
a. Inverter manufacturer, Type, Size, Impedances. Attach copy of inverter data sheet.	
b. Power Factor Range Capability	
c. Inverter Reactive Power Capability Curve	
d. Auxillary loads (P, Q, Power Factor)	
e. Inverter's Internal Isolation Transformer Grounding Method, if used (i.e. effectively grounded, resonant grounded, low inductance grounded, high-resistance grounded, low-resistance grounded, ungrounded). If the transformer is not solidly grounded, provide the impedance value for the grounding neutral and the impedance for the isolation transformer.	
f. Diagram for Inverter's internal isolation transformer	
g. Switching and service restoration practice	
h. Protection data (voltage ride-through and trip settings, frequency ride-through and trip settings etc.). Include setpoint and clearing time ranges for voltage and frequency settings.	
i. Description of harmonic spectrum of inverter injection (order, magnitude)	
5) Energy Storage System, if applicable	
a. Operation characteristics	
b. Voltage level	
c. Capacity (how long and how much can the battery support)	
d. Deployment strategy/schedule	
e. Energy storage system data sheet	
6) For the PV plant's collector system, please provide the following, as applicable:	
a. Conductor data such as size, insulation, etc.	
b. Continuous and emergency current ratings.	
c. Voltage rating (nominal and maximum kV).	
d. BIL rating.	
e. Positive, negative, and zero-sequence impedances (resistance, reactance, and susceptance).	
f. Capacitance or charging current.	
g. Short-circuit current capability.	

**Project Interconnection - Data Request
FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

	Response
7) Please provide the following software models that accurately represent the Facility: (For model requirements, refer to the HECO Facility Technical Model Requirements and Review Process and PSCAD Model Requirements Rev.9)	
a. Validated PSS/E load flow model up to the point of interconnection. The PSS/E model shall include the main transformer, collection system, generator step-up transformers, inverter systems, and any other components including capacitor banks, energy storage systems, DVAR, etc. An equivalent representation of the collection system, generator step-up transformers, and inverter systems is acceptable. Documentation on the model shall be provided.	
b. Validated PSS/E dynamic model for the inverter; and other components including energy storage system, DVAR, etc. if applicable. The inverter model shall include the generator/converter, electrical controls, plant-level controller, and protection relays. Generic and Detailed models shall be provided. Documentation on the model(s) shall be provided, including the PSS/E dyre file with model parameters.	
i. Generic models shall parameterize models available within the PSS/E standard model library.	
ii. Detailed models shall be supplied by the vendor/manufacturer as user-written models. The uncompiled source code for the user-written model shall be provided to ensure compatibility with future versions of PSS/E. In lieu of the uncompiled source code, a compiled object file and applicable library files shall be provided in PSS/E versions 33 AND 34 format. Updates of the object file compatible with future PSS/E versions must be provided as requested for the life of the project as written in the power purchase agreement. Documentation shall include the characteristics of the model, including block diagrams, values, names for all model parameters, and a list of all state variables.	
c. Validated PSCAD model of the inverter; and other components including energy storage system, DVAR, auxiliary plant controllers, etc. if applicable. Documentation on the model(s) shall be provided. Refer to PSCAD Model Requirements Memo for model requirements.	
d. Overlaid plots validating the performance of the three dynamic models for a three-phase fault. Plots shall include voltage, real and reactive power, real and reactive current.	
e. Validated Aspen Oneliner short circuit model that accurately represents the facility (including energy storage system if applicable), and is valid for all faults conditions anywhere on the Utility system. Documentation on the model(s) shall be provided. (OTHERWISE SEE ADDITIONAL TABS FOR REQUIRED INFORMATION TO MODEL INVERTER AS A GENERATOR OR A VOLTAGE CONTROLLED CURRENT SOURCE)	
8) For the main transformer and generator step-up transformers, please provide:	
a. Transformer voltage and MVA ratings, and available taps. Attach copy of transformer test report or data sheet	
b. The tap settings used.	
c. The LTC Control Scheme.	
d. Transformer winding connections and grounding used. If the transformer is not solidly grounded, provide the impedance value for the grounding method.	
e. Positive, negative, and zero sequence impedance values.	
9) For the circuit breakers and fault-clearing switching devices, including the generator breakers, please provide:	
a. The voltage, continuous current and interrupting capability ratings.	
b. The trip speed (time to open).	

**Project Interconnection - Data Request
 FOR PV GENERATION**

PROJECT: _____

DATE: _____

(Nonexclusive Preliminary List)

ALL ITEMS ARE REQUIRED AND ALL RESPONSES MUST BE FILLED UNLESS NOT APPLICABLE.

		Response
10)	For the power fuses, please provide:	
	a. The manufacturer, type, size, and interrupting capability.	
	b. The minimum melt and total clearing curves.	
11)	For the protective relaying, please provide:	
	a. Data for the CTs used with the relaying including the manufacturer, type of CT, accuracy class, and thermal rating factor.	
	b. Data for the PTs used with the relaying including the manufacturer, type of PT, voltage ratings, and quantity.	

Instructions:

Please fill in the data in the green blanks below

(Note: This does not include the internal isolation transformer, if used)

[1] Maximum rated output power = kVA

[2] Impedances in **Per Unit** based on kVA from [1]

	R	X
Subtransient =	<input type="text"/>	<input type="text"/>
Transient =	<input type="text"/>	<input type="text"/>
Synchronous =	<input type="text"/>	<input type="text"/>
Negative Sequence =	<input type="text"/>	<input type="text"/>
Zero Sequence =	<input type="text"/>	<input type="text"/>

[3] Neutral impedance (if any) in actual **Ohms**:

R	X
<input type="text"/>	<input type="text"/>

NOTE: These parameters should reflect the inverter response for all types of faults at any point on the electrical system to which the inverter is connected. This includes faults at the inverter output terminals, and also on the 138 kV transmission system. If the stated parameters do not cover this range, please state the adjustments needed to these parameters to accurately represent the inverter response across this range.

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:

Generating Unit Info

ID= Unit rating= 0.25 MVA

Impedances (pu based on unit MVA)

Subtransient +j

Transient +j

Synchronous +j

- sequence +j

o sequence +j

Neutral Impedance (in actual Ohms)

+j

Scheduled generation. Enter MVAR for PQ buses only

MW= MVAR=

P and Q limits (MW and MVAR)

Pmax= Qmax=

Pmin= Qmin=

Instructions:

Please fill in the data in the green blanks below

- [1] Internal open circuit voltage
Magnitude = Per Unit
Angle = Degrees
- [2] AC Output Current Limit = Amps

NOTE: These parameters should reflect the inverter response for all types of faults at any point on the electrical system to which the inverter is connected. This includes faults at the inverter output terminals, and also on the 138 kV transmission system. If the stated parameters do not cover this range, please state the adjustments needed to these parameters to accurately represent the inverter response across this range.

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:

Generator Data

Generators at 200 INVERTER 0.2kV

Unit '1' On-Line

Edit
On/Off-Line
New
Delete

Internal V-Source
p.u. = 1.
Ref. angle = 0.

Current Limits (A)
A: 900. B: 0.

Power Flow Regulation
 Regulates voltage Fixed P+iQ output

Memo:

Tags: None

Done Help

Last changed Apr 18, 2010

Instructions:

Please fill in the data in the green blanks below

[1] Inverter MVA Rating: MVA

[2] Voltage-Current Characteristics:

Voltage PU	Current (A)	PF Angle (deg)
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

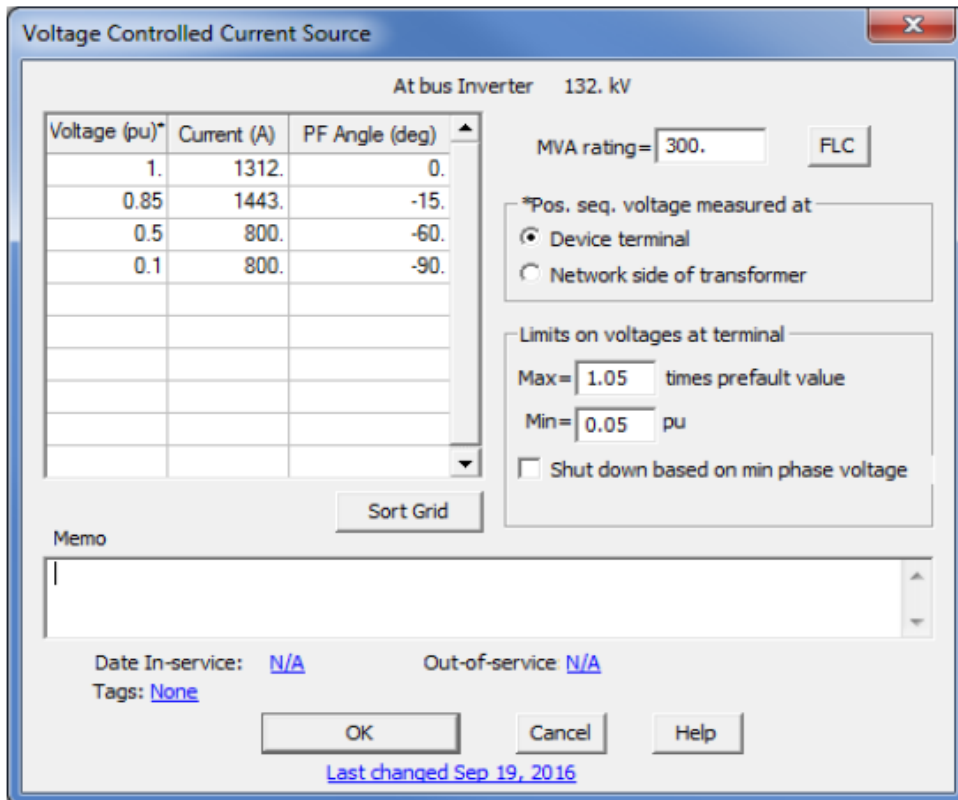
[3] Location of Voltage Measurement:

Device Terminal OR
 Network side of Transformer

[4] Maximum Voltage: Times prefault value

[5] Minimum Voltage Per Unit

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:



Instructions:

Please fill in the data in the green blanks below

(Note: This is not required if an internal isolation transformer is not used)

[1] Transformer rated power = kVA

[2] Winding Configuration
 Inverter Side = Delta/Wye
 Customer Side = Delta/Wye

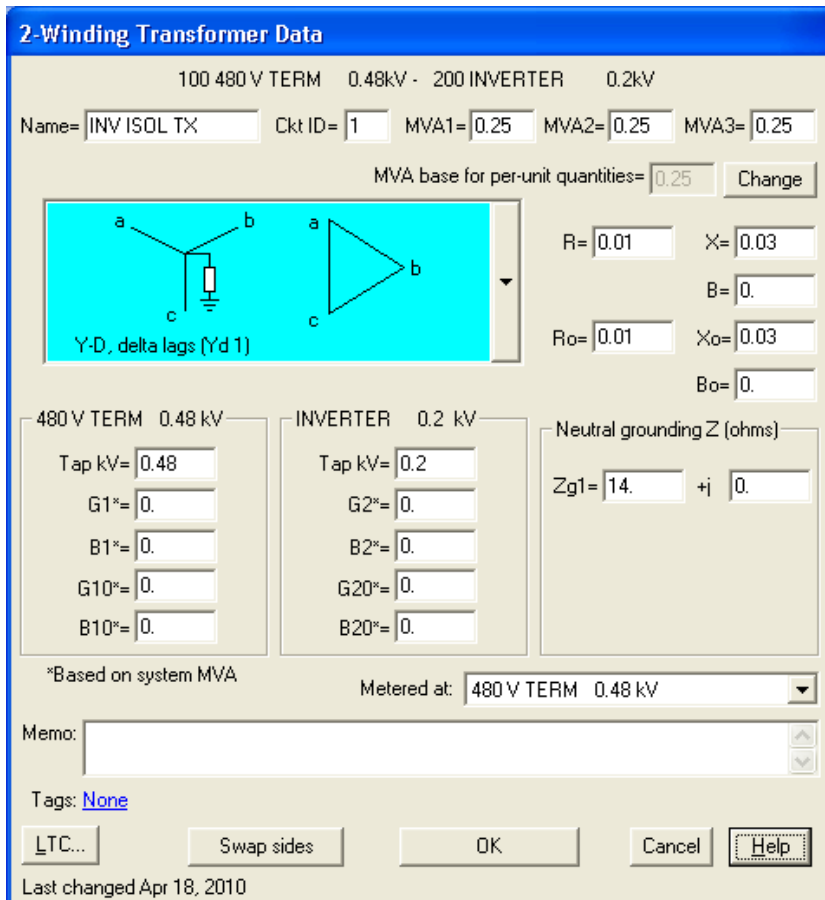
[2] Impedances in **Per Unit** based on kVA

	R	X
Positive Sequence =	<input type="text"/>	
Zero Sequence =		

[3] Neutral impedance (if any) in actual **Ohms**:

R	X
<input type="text"/>	

These parameters will be used to model the inverter in the Aspen Oneliner program as shown in the sample dialog box below:



Appendix B Attachment 3

HECO FACILITY TECHNICAL MODEL REQUIREMENTS AND REVIEW PROCESS

March 17, 2020

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1 INTRODUCTION

This document summarizes requirements of generation facility technical model submittals for request for proposals for variable renewable dispatchable generation and energy storage and describes the review process for model submittals.

2 FACILITY TECHNICAL MODEL REQUIREMENTS

To fully investigate impacts of the proposed generation facility on Hawaiian Electric's system and correctly identify any mitigation measures, the proposed generation facility technical model, along with related technical documents, will need to be submitted as part of the project interconnection review and prior to the Interconnection Requirements Study (IRS). The generation facility technical model includes:

1. PSCAD model
2. Generic PSS/E power flow model
3. User defined PSS/E dynamic model
4. Generic PSS/E dynamic model, and
5. ASPEN model

Along with the technical models, following documents should also be submitted for review:

6. User manual for all technical models
7. Generation facility one-line diagram
8. Generation unit manufacturer datasheet
9. Generation unit reactive power capability curve
10. Overlaid generation facility technical model output data for three-phase fault and single-phase fault. (Sample plots are shown in Appendix A)

2.1 General requirements for all technical models

All technical models need to represent the whole generation facility, not only a generation unit such as one inverter. At minimum, the following equipment shall be included in the generation facility model:

1. Generation unit, such as inverter with DC side model, rotation machine with model of exciter and governor.
2. Step up transformer
3. Collection system
4. Main interconnection transformer, or GSU, with its tap changer if applicable
5. Grounding transformer
6. Conductor
7. Var compensation device, such as cap bank or STATCOM, if applicable
8. Power plant controller (not for ASPEN model)
9. Documentation
10. Gen-tie line (as applicable)

An equivalent representation of the collection system, generator step-up transformers, and inverter systems is acceptable.

2.2 Requirements for generation facility PSCAD model

In addition to the general requirements mentioned above, the generation facility PSCAD model shall satisfy requirements as described in the document "PSCAD Model Requirements Rev. 9" provided by Hawaiian Electric.

2.3 Requirements for generation facility generic PSS/E power flow model

The generation facility PSS/E power flow model shall be provided for both PSS/E version 33 and version 34. Besides the general requirements mentioned above, the following modeling data shall be provided in the model:

1. Conductor
 - a. Impedance, both positive sequence and zero sequence
 - b. Rating: Rating A – normal rating, and Rating B – emergency rating
2. Transformer
 - a. Nominal voltages of windings
 - b. Impedance data: specified R and X
 - c. Tap ratios
 - d. Min and Max tap position limits
 - e. Number of tap positions
 - f. Regulated bus
 - g. Ratings: Rate A – normal rating; Rate B – emergency rating
 - h. Winding configuration
3. Reactive power compensation, if applicable
 - a. Fixed Shunts: G-Shunt (MW), B-Shunt (MVar)
 - b. Switched Shunts: Voltage limits (V_{hi} and V_{low}), mode of operation (fixed, discrete, continuous), regulated bus, Binit (MVar), steps and step size (MVar)
4. Generation unit
 - a. P_{max}
 - b. P_{min}
 - c. Q_{max}
 - d. Q_{min}
 - e. Name plate MVA
 - f. Transformer data: R_{Tran}, X_{Tran}, and G_{entap}.
 - g. Voltage control point

2.4 Requirements for generation facility user defined PSS/E dynamic model

The submitted user defined PSS/E dynamic model should meet the following requirements:

1. The generation facility PSS/E dynamic model shall be provided for both PSS/E version 33 and version 34.
2. The project shall be modeled at full output per the project's Interconnection Request.
3. User defined dynamic models must accurately model all the relevant control modes and characteristics of the equipment, such as:

- a. All available voltage/reactive power control modes
 - b. Frequency/governor response control modes
 - c. Voltage and frequency ride-through characteristics
 - d. Power plant controller or group supervisory functionality
 - e. Appropriate aggregate modeling capability
 - f. Charging mode if applicable (e.g., for a battery energy storage device)
4. Dynamic model source code (.flx) or dynamic linked library (.dll), and PSS/E dyr file shall be provided.
 5. User defined dynamic model plant-specific settings shall comply with requirements listed in the Power Purchase Agreement, including ride-through thresholds and other specified control settings if applicable.
 6. User defined dynamic models related to individual units shall be editable in the PSS/E graphic user interface. All model parameters (CONS, ICONS, and VARS) shall be accessible and shall match the description in the model's accompanying documentation.
 7. User defined dynamic models shall have all their data reportable in the "DOCU" listing of dynamics model data, including the range of CONS, ICONS, and VARS numbers. Models that apply to multiple elements (e.g., park controllers) shall also be fully formatted and reportable in DOCU.
 8. User defined dynamic models shall be capable of correctly initializing and run through the simulation throughout the range of expected steady state starting conditions without additional manual adjustments.
 9. User defined dynamic models shall be capable of allowing all documented (in the model documentation) modes of operation without error.
 10. User defined dynamic model shall be accompanied by the following documentation:
 - a. A user's guide for each model
 - b. Appropriate procedures and considerations for using the model in dynamic simulations
 - c. Technical description of characteristics of the model
 - d. Block diagram for the model, including overall modular structure and block diagrams of any sub-modules
 - e. List of plant-specific settings, which may include:
 - i. Ride-through thresholds and parameters
 - ii. Plant-level voltage controller settings
 - iii. Power ramp rate settings
 - iv. ICON flag parameters for specific control modes
 - v. Deadbands
 - vi. Initial State of Charge (SOC)
 - f. Values, names and detailed explanation for all model parameters
 - g. List of all state variables, including expected ranges of values for each variable

2.5 Requirements for generation facility generic PSS/E dynamic model

The submitted generic PSS/E dynamic model should meet the following requirements:

1. All generic PSS/E dynamic models must be standard library models in PSS/E.

Appendix B Attachment 3

2. The generation facility PSS/E dynamic model shall be provided for both PSS/E version 33 and version 34.
3. The project shall be modeled at full output per the project's Interconnection Request.
4. Generic dynamic models must accurately model all the relevant control modes and characteristics of the equipment, such as:
 - a. All available voltage/reactive power control modes
 - b. Frequency/governor response control modes
 - c. Voltage and frequency ride-through characteristics
 - d. Power plant controller or group supervisory functionality
 - e. Appropriate aggregate modeling capability
 - f. Charging mode if applicable (e.g., for a battery energy storage device)
5. PSS/E dyr file shall be provided.
6. Generic dynamic models' plant-specific settings should comply with requirements listed in the Power Purchase Agreement, including ride-through thresholds and other specified control settings if applicable.
7. Generic dynamic models shall be capable of correctly initializing and run through the simulation throughout the range of expected steady state starting conditions without additional manual adjustments.
8. Generic dynamic models shall be accompanied by the following documentation:
 - a. A user's guide for each model
 - b. Appropriate procedures and considerations for using the model in dynamic simulations
 - c. Technical description of characteristics of the model
 - d. List of plant-specific settings, which may include:
 - i. Ride-through thresholds and parameters
 - ii. Plant-level voltage controller settings
 - iii. Power ramp rate settings
 - iv. ICON flag parameters for specific control modes
 - v. Deadbands
 - vi. Initial State of Charge (SOC)

2.6 Requirements for generation facility ASPEN model

Besides the general requirements, validation results of single phase and three-phase fault current from the generation unit represented in the generation facility ASPEN model shall be provided.

3 GENERATION FACILITY TECHNICAL MODEL REVIEW PROCESS

To review the generation facility technical model, the following procedures are performed in the PSCAD and PSS/E environment. A review of the results will be documented and provided to the Customer for confirmation of model acceptance or further model updates.

3.1 Model review in PSCAD

- 1) Review model data against “Technical memo PSCAD requirements V5.pdf” provided by Hawaiian Electric. In this step, it will be determined whether the model is complete, generation facility settings are according to the Power Purchase Agreement, and if the model can be compiled and run without any error.
- 2) Initialization test:
In this step, the generation facility PSCAD model will be determined whether the model initialization is acceptable. Hawaiian Electric requires that:
 - a. The PSCAD model shall initialize as quickly as possible (e.g. <1-3 seconds) to user defined terminal conditions.
 - b. Project PSCAD model shall initialize properly and that the same power flow and voltage conditions shall be observed between the PSCAD and PSS/E models after initialization.
- 3) Voltage and frequency ride-through tests:
In this step, the generation facility PSCAD model ride-through performance will be reviewed by performing voltage and frequency ride-through simulations in PSCAD. The review will focus on the generation facility model dynamic response during and after ride-through and generation facility trip time.
- 4) Fault simulation tests:
Two types of fault tested at the Point of Interconnection bus of the generation facility will be performed in this step.
 - i) 3-phase to ground fault with 6-cycle clearing time (same as the PSS/E ring down model test described in the following section).
 - ii) 1-phase to ground fault simulation with 6-cycle clearing time.

In this test, fault current contribution from the generation facility observed in the simulation will be reviewed by comparing it against the generation facility technical document.

3.2 Model review in PSS/E

- 1) Model data review:
Review model data based on the requirements for PSS/E power flow and dynamic model provided by Hawaiian Electric. In this step, the review determines whether the model is complete, generation facility settings is according to the PPA, and model can be compiled and run without any error.
- 2) Flat start test:

Appendix B Attachment 3

PSS/E models shall initialize correctly and be capable of successful “flat start” testing using the 20 Second No-Fault simulation: This test consists of a 20 second simulation with no disturbance applied.

3) Ring down test:

PSS/E models shall initialize correctly and be capable of successful “ring down” testing using the 60 Second Disturbance Simulation: This test consists of the application of a 3-phase fault for 6 cycles at POI bus, followed by removal of the fault without any lines being tripped. The simulation is run for 60 seconds to allow the dynamics to settle.

4) Voltage and frequency ride-through tests:

In this step, the generation facility PSS/E model ride-through performance will be reviewed by performing voltage and frequency ride-through simulation in PSS/E. The review will focus on the generation facility model dynamic response during and after ride-through and generation facility trip time.

4 TYPICAL ISSUES IDENTIFIED FROM THE FACILITY MODEL SUBMITTALS DURING THE PAST RFP PROCESS

1. Missing documentation

Only generation technical facility models are submitted, but no model user manual or any other documentation. Without model documentation, it is very difficult to know the correct procedures of using the technical models and identifying issues during the review.

2. Model incompleteness

Often, the model of a single generation unit, such as an inverter, is submitted instead of model of the whole generation facility, which is insufficient. The model of the generation facility should include models for all equipment listed in the section of "General requirements for all technical models".

3. Settings in the model

Type issues in this category are:

- The PSCAD and PSS/E model ride-through settings are not consistent with the settings defined in the Power Purchase Agreement.
- Generation MW is not set as defined.
- Model is set for 50 Hz instead of 60 Hz

4. Model function issues

Some models do not function as expected during different test scenarios. For example:

- Fault current contribution from the generation facility is higher than what is described in the generation facility datasheet
- Generation level is not stable as settings during the initialization test
- Long time oscillation observed in the ringdown test
- Ride-through performance does not reach requirements defined in the Power Purchase Agreement

REFERENCE

- [1] New England Iso Planning procedure – Interconnection planning procedure for generation and elective transmission upgrades
- [2] ERCOT Planning Guide, 2019
- [3] PJM MOD-032 Steady State, Dynamics, and Short Circuit Modeling Data Requirements and Reporting Procedures Document

APPENDIX A: SAMPLE OVERLAID GENERATION FACILITY TECHNICAL MODEL OUTPUT PLOT FOR THREE-PHASE FAULT

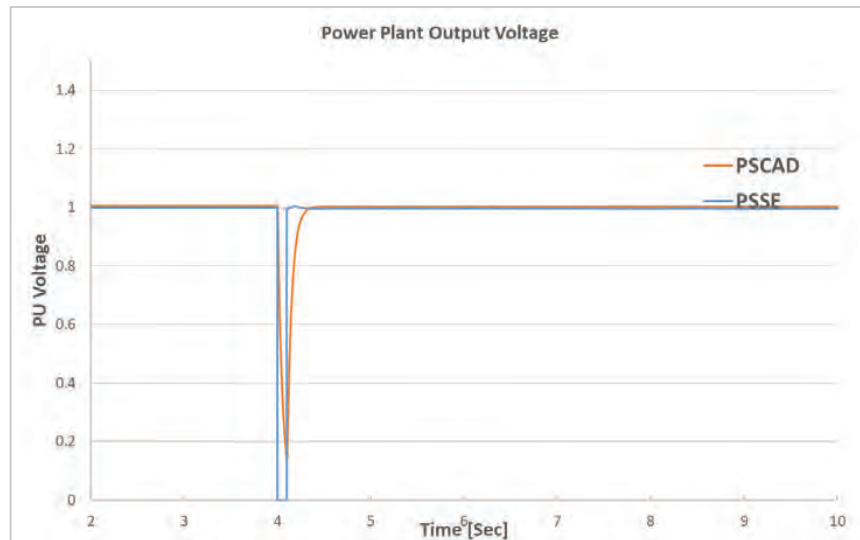


Figure 1: Overlaid plot for power plant voltage

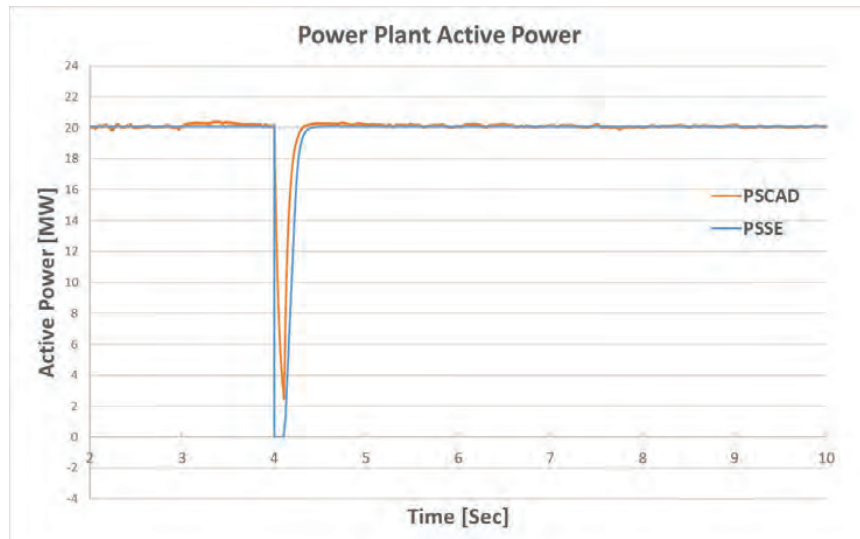


Figure 2: Overlaid plot for power plant active power generation

Appendix B Attachment 3

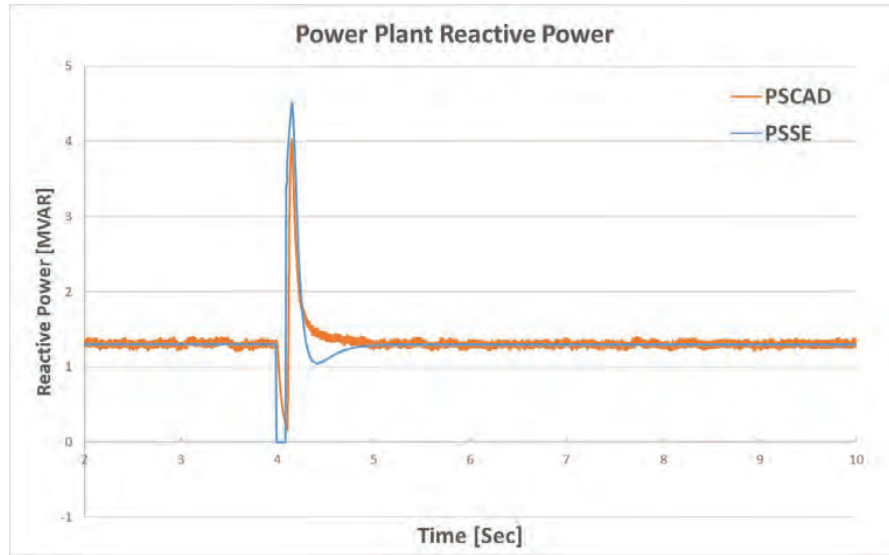


Figure 3: Overlaid plot for power plant reactive power generation

APPENDIX B: SAMPLE TEST SYSTEM TOPOLOGY INFORMATION

On weak grids such as island systems, it is important to test the models using a representative high Thevenin equivalent impedance.

A typical topology of testing circuit which represents Hawaiian Electric system for 46 kV project is shown in Figure 4. Sample 46 kV Thevenin equivalent impedance is available upon request for model testing.

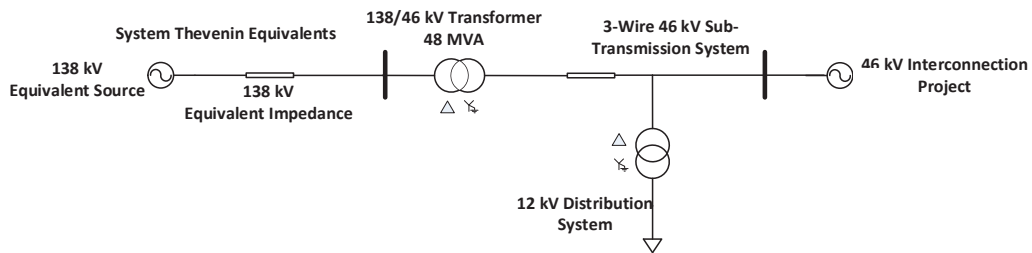


Figure 4: Testing circuit single line diagram for 46 kV project

A typical topology of testing circuit which represents Hawaiian Electric system for 138 kV project is shown in Figure 5. Sample 138 kV Thevenin equivalent impedance is available upon request for model testing.

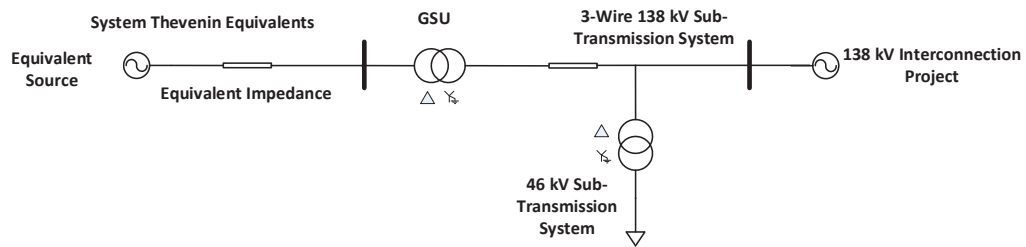


Figure 5: Testing circuit single line diagram for 138 kV project

PSCAD Model Requirements Rev. 9

Date: May 8, 2020
Prepared By: Andrew L. Isaacs
Lukas Unruh
Garth Irwin

This document includes the following attachments:

Attachment #1: PSCAD Model Test Checklist

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Introduction

Specific model requirements for a PSCAD study depend on the type of study being done. A study with a scope covering weak system interconnections, ride-through evaluation, short term¹ event response, and fast control interaction with nearby devices (for example) would require a model which has the following characteristics. Some specialty studies may require other features. Refer to “Attachment #1: PSCAD Model Test Checklist” and “Attachment #2: PSCAD Model Requirements Supplier Checklist”, appended to this document, for additional information on how these requirements may applied.

Model Accuracy Features

For the model to be sufficiently accurate, it must:

- A. *Represent the full detailed inner control loops of the power electronics.* The model cannot use the same approximations classically used in transient stability modeling, and should fully represent all fast inner controls, as implemented in the real equipment. Models which embed the actual hardware code into a PSCAD component are currently wide-spread, and this is the recommended type of model.²
- B. *Represent all control features pertinent to the type of study being done.* Examples include external voltage controllers, plant level controllers, customized PLLs, ride-through controllers, SSCI damping controllers and others. As in point A, actual hardware code is recommended to be used for most control and protection features. Operating modes that require system specific adjustment should be user accessible. Plant level voltage control should be represented along with adjustable droop characteristics. If multiple plants are controlled by a common controller, this functionality should be included.
- C. *Represent all pertinent electrical and mechanical configurations.* This includes any filters and specialized transformers. There may be other mechanical features such as gearboxes, pitch controllers, or others which should be modelled if they impact electrical performance within the timeframe of the study. Any control or dynamic features of the actual equipment which may influence behaviour in the simulation period which are not represented or which are approximated should be clearly identified.

¹ Example analysis periods could be 2 to 10 seconds from fault inception. Some studies could require longer periods.

² The model must be a full IGBT representation (preferred), or may use a voltage source representation that approximates the IGBT switching but maintains full detail in the controls. A three phase sinusoidal source representation is not acceptable. Models manually translated block-by-block from MATLAB or control block diagrams may be unacceptable because the method used to model the electrical network and interface to the controls may not be accurate, or portions of the controls such as PLL circuits or protection circuits may be approximated or omitted. Note that firmware code may be directly used to create an extremely accurate PSCAD model of the controls. The controller source code may be compiled into DLLs or binaries if the source code is unavailable due to confidentiality restrictions.

It is not recommended to assemble the model using standard blocks available in the PSCAD master library, as approximations are usually introduced, and specific implementation details for important control blocks may be lost. In addition, there is a significant risk that errors will be introduced in the process of manually assembling the model. For this type of manually assembled model, (not using a direct “real code” embedding process), extra care is required, and validation is required.

- D. *Have all pertinent protections modeled in detail for both balanced and unbalanced fault conditions.* Typically this includes various OV and UV protections (individual phase and RMS), frequency protections, DC bus voltage protections, converter overcurrent protections, and often other inverter specific protections. As in point A, actual hardware code is recommended to be used for these protection features.
- E. *Be configured to match expected site-specific equipment settings.* Any user-tunable parameters or options should be set in the model to match the equipment at the specific site being evaluated, as far as they are known. Default parameters may not be appropriate.

Model Usability Features

In order to allow study engineers to perform system analysis using the model, the PSCAD model must:

- F. *Have control or hardware options which are pertinent to the study accessible to the user.* Examples of this could include protection thresholds, real power recovery ramp rates, or SSCI damping controllers.³ Diagnostic flags (eg. flags to show control mode changes or which protection has been activated) should be visible to aid in analysis.
- G. *Be accurate when running at a simulation time step of 10 μ s or higher.* Often, requiring a smaller time step means that the control implementation has not used the interpolation features of PSCAD, or is using inappropriate interfacing between the model and the larger network. Lack of interpolation support introduces inaccuracies into the model at larger simulation time-steps. In cases where the IGBT switching frequency is so high that even interpolation does not allow accurate switching representation at 10 μ s (eg. 40 kHz), an average source approximation of the inverter switching may be used to allow a larger simulation time step².
- H. *Operate at a range of simulation time steps.* The model should not be restricted to operating at a single time step, but should be able to operate within a range (eg. 10 μ s – 20 μ s)
- I. *Have the ability to disable protection models.* Many studies result in inadvertent tripping of converter equipment, and the ability to disable protection functions temporarily provides study engineers with valuable system diagnostic information.
- J. *Include documentation and a sample implementation test case.* Test case models should be configured according to the site-specific real equipment configuration up to the Point of Interconnection. This would include (for example): aggregated generator model, aggregated generator transformer, equivalent collector branch, main step up transformers, gen tie line, and any other static or dynamic reactive resources. Test case should use a single machine infinite bus representation of the system, configured with an appropriate representative SCR, such as 2.5. Access to technical support engineers is desirable.
- K. *Have an identification mechanism for configuration.* The model documentation should provide a clear way to identify the specific settings and equipment configuration which will be used in any

³ Care should be taken to ensure that any user-settable options are not changed in a way that is not implementable in the real hardware, and that any selectable options are actually available at the specific site being considered. Discussion is recommended with the manufacturer prior to any changes being made in model configuration.

- study, such that during commissioning the settings used in the studies can be checked. This may be control revision codes, settings files, or a combination of these and other identification measures.
- L. *Accept external reference variables.* This includes real and reactive power ordered values for Q control modes, or voltage reference values for voltage control modes. Model should accept these reference variables for initialization, and be capable of changing these reference variables mid-simulation, ie. dynamic signal references.
 - M. *Be capable of initializing itself.* Once provided with initial condition variables, the model must initialize and ramp to the ordered output without external input from simulation engineers. Any slower control functions which are included (such as switched shunt controllers or power plant controllers) should also accept initial condition variables if required.
 - N. *Have the ability to scale plant capacity.* The active power capacity of the model should be scalable in some way, either internally or through an external scaling transformer⁴. This is distinct from a dispatchable power order, and is used for modeling different capacities of plant or breaking a lumped equivalent plant into smaller composite models.
 - O. *Have the ability to dispatch its output to values less than nameplate.* This is distinct from scaling a plant from one unit to more than one, and is used for testing plant behaviour at various operating points.
 - P. *Initialize quickly.* Model must reach its ordered initial conditions as quickly as possible (for example <5 seconds) to user supplied terminal conditions.

Study Efficiency Features

In addition, the following elements are required to improve study efficiency, model compatibility, and enable other studies which include the model to be run as efficiently as possible. If these features are not supported, additional discussion is required⁵:

- Q. Model should be compatible with Intel Fortran compiler version 12 and higher.
- R. Model should be compatible with PSCAD version 4.5.3 and higher.
- S. Model supports multiple instances of its own definition in the same simulation case.
- T. Model supports the PSCAD “timed snapshot” feature accessible through project settings.
- U. Model supports the PSCAD “multiple run” feature.
- V. Model does not use or rely upon global variables in the PSCAD environment.
- W. Model should not utilize multiple layers in the PSCAD environment, including ‘disabled’ layers.

⁴ A free publicly available scaling transformer suitable for this purpose is available in the E-Tran library.

⁵ Electrenix has parallelization tools available (E-Tran Plus for PSCAD) which can circumvent compatibility concerns in some cases.

Attachment #1: PSCAD Model Test Checklist

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Purpose

This document is a test checklist meant to accompany “PSCAD Model Requirements Rev. 9” provided above and “Attachment #2: PSCAD Model Requirements Supplier Checklist”. The procedures provided in this document are intended to provide an indication of the core model accuracy, performance, and usability features specified in the model requirements. These procedures cannot ultimately prove that the model is compliant with all requirements, as black box models usually hide the details of the equipment controls and protection. It is recommended that the equipment manufacturer supply additional confirmation that the model meets each individual requirement. The requirements in this document do not necessarily represent interconnection criteria for specific individual systems, and may be supplemented or adjusted based on interconnection region.

The tests outlined here are considered “basic”, and may be supplemented by more rigorous testing, including various fault types, depths, and durations, as well as more extensive protection testing and benchmarking against phasor models. This document is not intended to be a guide for thorough benchmarking between PSCAD, PSS/E, and actual equipment, and is subject to revision as the state of the art in EMT modeling evolves.

<i>Model test Summary</i>	
Model Test date:	
Project Name:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file:	
Model Files supplied:	

Verification Procedure and Checklist

		Pass/Fail	Comments
<i>Vendor and site specific model verification</i>			
1a	The Vendor's name and the specific version of the model should be clearly observable in the .psc model file.		
1b	Documentation and supporting model filenames should not conflict with model version shown in the .psc model file.		
1c	Model is supplied with a test circuit which is configured for the site specific application. ⁶		
<i>"Real Code" model verification</i>			
2a	Controls are black-boxed, and no PSCAD master library control blocks are visible within control circuits. ⁷ If the model is not based on "real code", a separate validation report is required showing model comparison against hardware tests. ⁸		
<i>Model usability verification</i>			
3a	Model uses a timestep greater than 10 μs ⁹		
3b	Model allows a variation in simulation timestep		
3c	Model compiles using Intel FORTRAN version 12		
3d	Model initializes in 5 seconds or less with a POI level SCR of 2.5. Real power, reactive power, and RMS voltage should reach steady state by this time.		
3e	Model allows multiple instances of itself to be run together in the same case ¹⁰		
<i>Model electrical configuration verification</i>			
4a	Plant level electrical single line diagram (SLD) is included.		

⁶ The test circuit should model all relevant electrical components of the plant and contain a system equivalent. Parameters will be assumed to be site-specific, unless there are obvious indications otherwise, such as an incorrect grid base frequency.

⁷ Black-boxing of controls to a high level does not guarantee that real-code is embedded into the model, however the visibility of PSCAD master-library control blocks in the inner control loops (PLL, inner current controllers, etc.) suggest that the model is generic in nature. Model documentation may contain information on use of real-code in the model.

⁸ All aspects of the controller operation are required to be validated by utilizing a "hardware in loop" platform or other hardware test systems. Model should not be validated against other software models. Validations should include control responses to various types of faults, changes in power and voltage references, changes in system frequency, testing frequency response in sub and super-synchronous ranges, and testing of protection operation. Tests should also be performed under a variety of system strengths, including very weak systems. Other tests may also be required. The validation report is required along with any model updates that result from the more rigorous validation tests.

⁹ Models with timesteps less than 10 μs may be acceptable in situations where a small timestep does not significantly increase the runtime of the total simulation

¹⁰ Depending on specific application and whether E-Tran Plus for PSCAD is allowed to be used to overcome the limitation, this requirement may be waived.

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4b	Generator step-up transformer(s) included, with impedance between 5 and 10% on generator base, and matches SLD. ¹¹		
4c	Lumped collector equivalent(s) included, with total charging equal to between 0.5 and 5% of plant rating, and matches SLD. ¹¹		
4d	Substation transformer(s) included, rated appropriately for plant size, and impedance between 6 and 12% on transformer base, and matches SLD. ¹¹		
4e	Model can be scaled to represent any number inverters/turbines, either using a scaling transformer or internal scaling.		
4f	All external devices included in the plant (such as STATCOMs) include appropriate models.		
<i>Plant controller verification</i>			
5a	Model includes power plant controller (PPC)		
5b	PPC accepts an external active power setpoint.		
5c	PPC accepts a voltage setpoint.		
5d	PPC has a mechanism to implement a settable voltage droop.		
5e	Overall plant responds to frequency changes by increasing or decreasing its active power as appropriate. This may be accomplished either at an inverter level or via the PPC. ¹²		
5f	Model initializes to the setpoints specified in the PPC. If droops or deadbands are utilized, the initial values may differ from the setpoints. ¹³		
5g	If external voltage control devices (STATCOM/DVAR, SVC, MSCs) are included in the plant, ensure that the voltage control of these devices is coordinated with the PPC, with no potential for VAR looping or oscillations.		
<i>Basic performance verification¹⁴</i>			
6a	Instantaneous voltage and current waveforms have minimal distortion, and no oscillations are observed.		

¹¹ Impedance range is for sanity checking only. Impedances outside this range may be allowed.

¹² Non-compliance with this item may not require model revision as frequency response may not be required in PSCAD models by some utilities. In this case, a description of the under/over frequency response capabilities of the actual equipment should be provided by the manufacturer.

¹³ If voltage control with droop is implemented, it is preferred that the PPC model requests an initial Q value to match the voltage setpoint. If no initial Q is requested, the voltage setpoint can be biased by the initial Q before it is sent to the PPC. If a non-zero deadband is included in the voltage controller, the deadband can also be considered in the voltage setpoint sent to the PPC.

¹⁴ Performance testing is recommended with a POI level SCR of 2.5 as this is a representative system condition seen during weak system studies. Testing may be performed at higher SCRs if the stable operating SCR of a model is known to be above 2.5.

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6b	Model is able to ride-through and recover from a temporary (no line outage or drop in SCR), 6-cycle, zero-impedance, three-phase fault at the high side of the station transformer, with a POI level SCR of 2.5.		
6c	Model responds to a step change in PPC voltage setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. (Various systems may have specific speed requirements, which should be met)		
6d	Model responds to a step change in PPC active power setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. ¹⁵		
<i>Basic protection verification</i> ¹⁶			
7a	Protection settings are implemented. These could be available as inputs in the model, or hard-coded in the black-boxed controls. ¹⁷		
7b	Option to disable protection models is present. ¹⁸		
7c	Model trips or blocks when terminal voltage rises above 1.3 pu for 1.5 second. ¹⁹		
7d	Model trips or blocks when terminal voltage falls below 0.2 pu for 1.5 second. ¹⁹		
7e	Model clearly displays trip / diagnostic signals indicating the status of all pertinent protection elements		
<i>Documentation</i>			
8a	Model documentation states compliance with “PSCAD Model Requirements Rev. 9 Rev. 9” ²⁰ , or is supplied with a completed PSCAD Model Requirements Supplier Checklist.		
8b	Model documentation includes instructions for setup and running of the model, including the recommended range of simulation timesteps. Documentation should give a clear description of trip / operation code signals produced by model.		

¹⁵ Different response time criteria may apply depending on specific interconnection region.

¹⁶ There are many protection functions which should be modelled, per footnote 1, and these basic tests will not be proof that these are modelled.

¹⁷ If settings are not visible in model or documentation, verification that protection settings are implemented in the PSCAD model should be received from the manufacturer.

¹⁸ Non-compliance may not require model revision as many studies do not require testing with protection settings disabled.

¹⁹ Non-compliance with this item should result in verification of protection settings implementation from the manufacturer, as some models may have capabilities beyond what is listed here.

²⁰ Non-compliance may be waived in systems which do not require compliance with the model requirements document.

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Purpose

This document is a model requirements checklist which should be completed by the supplier of the model and submitted alongside each PSCAD model. This document accompanies the “PSCAD Model Requirements Rev. 9” document above (PMR), which should be used for further reference to describe the requirements associated with each point. Generic testing of the model may be done using “Attachment #1: PSCAD Model Test Checklist”, which may be used as a reference.

Model supplier must review every item in the checklist and indicate compliance for each item. If the supplied model does not meet any of the requirements an explanation of the deficiency should be provided in the comments column.

<i>Model Submission Summary (to be completed by model supplier)</i>	
Submission date:	
Project Name:	
Primary contact information for model related questions:	
Secondary contact information for model related questions:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file(s):	
Model Files supplied:	

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Model Requirements Checklist		PMR Reference	Model Complies? (Yes/No)	Comments
1 Model Accuracy Features				
1.1	Power electronic controls are modelled by interfacing with actual firmware code from the inverter (“real code” model), or includes detailed validation report.	A, B		
1.2	Operating modes which require system specific adjustment are accessible.	B		
1.3	Plant level controller is included. ²¹	B		
1.4	Model is capable of controlling frequency ²²	B		
1.5	Includes pertinent electrical and mechanical features, such as gearboxes, pitch controllers, or other features which impact the plant performance in the simulation period. ²³	C		
1.6	All protections which could impact ride-through performance are modelled in detail.	D		
1.7	Model is configured for the specific site being evaluated, as far as they are known.	E		
2 Model and Project Documentation				
2.1	Model includes documentation.	J		
2.2	Documentation includes instruction for setup and running the model.	J		

²¹ If the plant is part of a multi-plant control scheme, a description of the overall scheme should be provided, and corresponding PPC models should be configured to control multiple plants accordingly.

²² Frequency control model requirements may vary by region. Example response time may be less than 10 seconds.

²³ Simulation period may vary depending on the model use, but 10 seconds of simulation following an event such as a fault is a typical period.



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2.3	Model is supplied with a sample test case including site specific plant representation.	J	
2.4	Plant single line diagram is provided, and aligns with model	J	
2.5	Model documentation provides a clear way to identify site-specific settings and equipment configuration.	K	
3	<i>Model Usability Features</i>		
3.01	Control or hardware options are accessible to the user as applicable.	F	
3.02	Diagnostic flags are visible to the user.	F	
3.03	Model uses a timestep greater than 10 μ s.	G	
3.04	Model allows a range of simulation timesteps (ie. not restricted to a single timestep).	H	
3.05	Protection model may be disabled for troubleshooting	I	
3.06	Model accepts external reference variables for active and reactive power and voltage setpoint, and these may be changed dynamically during the simulation.	L	
3.07	Model is capable of initializing itself.	M	
3.08	Active power capacity is scalable.	N	
3.09	Active power is dispatchable.	O	
3.10	Model reaches setpoint P, Q, and V in 5 seconds or less	P	
3.11	Model compatible with Intel FORTRAN version 12 and higher.	Q	
3.12	Model compiles using PSCAD version 4.5.3 or higher.	R	
3.13	Model supports multiple instances of its own definition in a single PSCAD case.	S	
3.14	Model supports PSCAD "snapshot" feature.	T	

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3.15	Model supports the PSCAD “multiple run” feature.	U	
3.16	Model does not use PSCAD global variables.	V	
3.17	Model does not use PSCAD layer functionality	W	

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Transmission and Distribution Planning Division - Interconnection Services Department
Simulation Tests
CBRE RFP Interconnection Requirement Study-System Impact Study
Date: July 7, 2020

1. Introduction

This document describes the simulation tests that Hawaiian Electric IRS study consultants will perform to check the models submitted for CBRE IRS. Results of these tests, combined with other checks on project input data and model parameters, will determine if the models are acceptable for the IRS studies. The models to be tested are PSS E user-written model, PSCAD model and ASPEN short-circuit model for each project.

It is recommended that the model submitters should also perform these tests to self-check on your models, so that your models will become acceptable for the IRS study in a timely manner.

2. Separate Models Required for Grid Following Mode and Grid Forming Mode

For the CBRE IRS, modeling of inverter Grid Forming capabilities may be required. For each project, separate models should be submitted: one with the project in Grid Forming (GFM) mode (if applicable), and the other with the project in Grid Following (GFL) mode. This requirement applies to all models mentioned above.

3. General Requirements

All submitted models should be accompanied by proper documentation.

There should be a reasonable match between the PSS E user-written model and the PSCAD model responses for the simulation tests performed for both models.

4. List of Simulation Tests

4.1 GFL Mode Simulation Tests

4.1.1 Tests to be performed for PSS E models

- a. Flat run in a two-machine system (one machine is a synchronous machine, e.g., GENCLS model, and the other machine is a project's model.)
- b. Ringdown (3ph-ground fault simulation test) in a two-machine system.



GFL-Tests to be performed for PSS E models - continued

- c. Voltage ride-through and response in a two-machine system.
- d. Frequency ride-through and response in a two-machine system.
- e. Weak grid operation in a two-machine system
Gradually increase/decrease MVA of the synchronous machine within a range and check if the project's model is able to work with the studied MVA range.
- f. Simulation in a relevant HECO island system model for a couple of selected faults
The purpose here is to identify potential issues with a project's PSS E model ahead of dynamic stability analysis to limit study delays due to model issues.

Note: also refer to "Siemens PTI Model Review process_200317.pdf".

4.1.2 Tests to be performed for PSCAD models only (includes model adequacy and documentation checks)

- g. Tests and checks outlined in "PSCAD Requirements Rev 9 May 2020.pdf", inclusive of ringdown, voltage and frequency ride-through tests.



4.2 GFM Mode Simulation Tests

4.2.1 Tests to be performed for both PSS E and PSCAD models

Test notes:

- Applicable for projects which include grid-forming BESS only
 - Assumption is that BESS has available energy and is dispatched suitably for the tests (i.e. Not at current limit)
- a. Able to black start and operate in island mode

Test sequence: energize main power transformer from project side, then connect project to a load, then apply a bus fault at the POI, then remove the fault. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbances.

- b. Loss of the last synchronous machine

Test system will be a three-machine system including: a synchronous machine modeled by GENROU with a simple excitation system model (e.g., SCRX) and a simple governor model (e.g., TGOV1), a load with both real and reactive components, and duplicates of a project's model. Duplicates of a project's model are utilized here to check if the project is able to share real and reactive power properly with other generators. Test event: trip the synchronous generator. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbance.

- c. Weak grid operation

Test system is the two-machine system. Gradually increase/decrease MVA of the synchronous machine within a range and check if the project's model is able to work with the studied MVA range.

- d. Able to operate in harmony with other converter resources and synchronous machines

Test system is the three-machine system including: a synchronous machine modeled by GENROU with a simple excitation system model and a simple governor model, a load with both real and reactive components, and duplicates of a project's model. Simulation tests to be performed may include load step up/down, ringdown, voltage ride through and frequency ride-through tests. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbances.



GFM Mode Simulation Tests – Tests to be performed for both PSS E and PSCAD models - continued

Particularly related to frequency control characteristics, we will test for configurable frequency droop control and configurable deadband characteristics. The frequency deadband should be settable in the range from +/- 0.01 Hz to +/- 1.0 Hz and the frequency droop shall be settable in the range of 0.1% to 10% with a typical value of 4%. A sample characteristic of frequency droop control with deadband is shown in Figure 1.

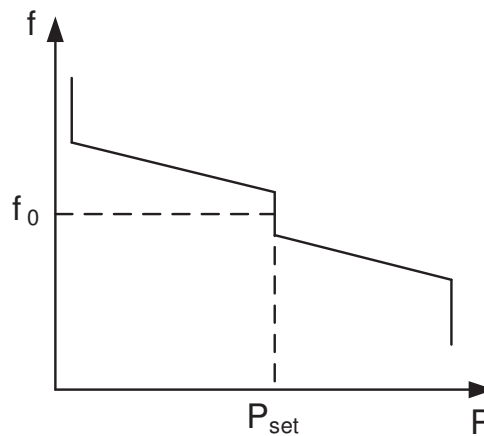


Figure 1 – Frequency Droop Control Characteristic with Deadband

e. Switching between GFL mode and GFM mode

Test system is the two-machine system. Test sequence: energize main power transformer from project side, then connect project to a load. At this point, the project will be operating in island mode, performing frequency control. Then switch in the synchronous generator; the project will be operating in power/frequency droop control mode. Results: voltage and frequency should be stable and settle back to close to their nominal values after the disturbances.

4.2.2 Tests to be performed for PSS E models only

a. Reduction in frequency deviation in GFM mode

Test system will be a relevant HECO island system model. Test event is loss of a large generator. Project model will be in GFL mode and GFM mode. Result: less degree of frequency deviation is expected when project is in GFM mode than when the project is in GFL mode.



4.3 ASPEN Model Check

A review of the ASPEN models will be performed. As mentioned above, two models are expected for each project: one model for GFL mode, and the other for GFM mode. Documentation associated with the models should be provided. The model review will check if the components of a project are modeled properly, such as transformers, equivalent collector system, equivalent generator, etc., and that the model data are consistent to the PSS E and PSCAD model data. A fault simulation test will also be performed in a two-machine system. Total current at the fault location and contribution from each machine will be reviewed and documented.



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Date: March 17, 2020

From: Osazuwa Oriakhi, Wenchun Zhu and Kavita Sheno, Siemens PTI

RE: HECO IRS Model Review Process

Message from Interconnection Services: This document shows you an example of the model data review and tests that a study consultant performs on your model data submittal under the Interconnection Requirement Study, System Impact Study (IRS SIS Agreement). The Test Package that you are receiving is repeated for the IRS. By performing these tests as a Do-it-Yourself (DIY), model data submittals when we receive them for the IRS SIS are understood to be accurate and have usability and efficiency features to integrate the facility model data with the Company's system model data and commence the IRS SIS analyses in a prompt and efficient manner.

Siemens PTI performs the following data checks and tests as a part of our Model review process.

A. Steady State Data Review

Siemens PTI will review the ratings and impedances of all equipment in the ASPEN, PSS®E and PSCAD models and check for discrepancies. Table 1 below shows the comparison of power flow data for all equipment in the PSS®E and PSCAD models.

Table 1. Steady State Data Review

Equipment	Comments
Gen-Tie line	PSS®E, PSCAD and ASPEN models should match
Main Power Transformer Impedance	PSS®E, PSCAD and ASPEN models should match
Main Power Transformer Configuration	PSCAD and ASPEN models should match
PV Collector System Data	PSS®E, PSCAD and ASPEN models should match
BESS Collector System Data	PSS®E, PSCAD and ASPEN models should match
Inverter Pad Mount Transformer Impedance	PSS®E, PSCAD and ASPEN models should match
Inverter Pad Mount Transformer Configuration	PSCAD and ASPEN models should match
Inverter Power Flow Data	PSS®E and PSCAD models should match
Voltage Control Point	PSS®E and PSCAD models should match

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B. Dynamic Model Data Review

There are three types of models which show the transient/dynamic behavior of the generation facility:

1. A PSS®E user-written dynamic model which is a detailed model of the specific inverters and controls provided by the manufacturer.
2. A PSS®E generic model which utilizes PSS®E library models to specify the dynamic behavior of the facility.
3. A PSCAD model which is a detailed transient model of the inverters and controls

Siemens PTI will compare the various dynamic model parameters across the three models and note any discrepancies in the data fields shown in Table 2.

Table 2. Comparison of Dynamic Model Parameters

Parameters	Comments
Power Plant Controller (PPC)	Review number of PPCs
Control Flags	PSS®E and PSCAD control flags should match.
Control Bus/Point of Measurement	Control buses should match in PSS®E and PSCAD models.
Frequency Control Dead Band	The frequency thresholds for primary and secondary control should match in the PSCAD and PSS®E models.
Initial State of Charge (SOC)	Make sure the initial state of charge is set up correctly to prevent initialization issues.
Voltage and Frequency Ride Through Settings	The voltage and frequency ride through settings should match in the PSS®E user-written, PSS®E generic and PSCAD models.
P/Q priority data	The P/Q priority flags should match in the PSS®E user-written, PSS®E generic and PSCAD models

C. Model tests

Siemens PTI will perform the following tests to check the active power, reactive power, voltage and frequency responses of the generation facility and review if the three models (PSS®E user-written, PSS®E generic and PSCAD models) show consistent responses.

1. **Flat Run Test:** This is a no-disturbance simulation to check a model's initialization. This test is applicable to all three types of models.
2. **Ring Down Test:** In this simulation, a fault is placed at the facility's POI for a duration of 6-cycles. The fault is subsequently cleared, and the post-disturbance response of the facility is observed. This test is applicable to all three types of models.
3. **High and Low Frequency Response Test:** In these simulations, the system frequency is varied to test the facility's responses to grid's frequency excursions. In the PSS®E tests, high and low frequency excursions are simulated to mimic the frequency ride through thresholds specified in the PPA and the response of the facility is observed. Both the frequency ride-through capability of the facility and its active power response to frequency excursions are tested in the PSS®E simulations.

In the PSCAD simulations, the focus is on testing the facility's active power responses to frequency excursions, and not on testing the frequency ride-through capability. However, it should be noted that the duration of the frequency excursions in the PSCAD tests are well-

Appendix B Attachment 3

within the no-trip zones according to the PPA, and so the facility is not expected to trip during these simulations. Table 3 and Table 4 show the frequency excursions that were simulated in the PSCAD tests.

Table 3 Frequency Excursions for PSCAD High Frequency Response Test

Frequency level (Hz)	Duration (secs)
60.1	2.0
63.0	2.0

Table 4 Frequency Excursions for PSCAD Low Frequency Response Test

Frequency level (Hz)	Duration (secs)
59.9	2.0
56.0	2.0

4. **High and Low Voltage Ride-through and Response Tests:** In these simulations, the POI voltage is varied to test the facility's ride-through capabilities and responses to POI voltage excursions. In the PSS[®]E simulations, two sets of tests are performed: one for testing the ride-through capabilities and the other for testing the responses to voltage excursions. These two sets of tests are similar, except that the grid equivalent representation is different. For the ride-through tests, the grid equivalent is represented by a generator with a very large MVA, which connects to the POI bus directly. For the voltage excursion response tests, the grid equivalent is represented by a 500 MVA generator which connects to the POI through a branch with a reactance of 0.1 p.u.

In the PSCAD simulations, the focus is on testing the facility's reactive power responses to POI voltage excursions, and not on testing the voltage ride-through capability. However, it should be noted that the duration of the voltage excursions in the PSCAD tests are well-within the no-trip zones according to the PPA, and so the facility is not expected to trip during these simulations.

Table 5 shows the voltage excursions that will be simulated in the PSCAD tests.

Table 5 POI Voltage Excursions for PSCAD Voltage Response Test

POI Voltage level (pu)	Duration (secs)
1.20	0.8
1.10	2.0
0.88	2.0
0.70	2.0

Each of the above discussed tests were performed for the following three generation dispatches:

- **PV output only:** In this dispatch, the PV unit is at maximum output and the BESS unit is online at 0 MW.
- **BESS output only:** In this dispatch, the BESS unit is discharging at maximum output and the PV unit is online at 0 MW.

Appendix B Attachment 3

- **PV charging BESS:** In this dispatch, the PV unit is at its maximum output and is charging the BESS at its minimum level.

D. Expected Model Performance

1. Matching steady-state model parameters between the PSS®E user-written, generic models and the PSCAD model.
2. Matching control options between the three types of models.
3. Matching voltage and frequency ride-through parameters between the three types of models. The settings should meet the ride-through requirements specified in the PPA.
4. Flat run results do not show any movement for any of the three models.
5. Ring-down simulation results show stable and proper responses, and the responses from the three models should show reasonable matches.
6. Ride-through simulation results should show stable and proper responses, and the responses should show reasonable matches. The ride through performance should meet the PPA requirements.

E. Model Review Reporting Requirements

1. Simulation tests should be performed using the python scripts provided by Siemens PTI, and should be readily reproducible.
2. Discuss model review results.
3. Include simulation plots for the simulation tests discussed above.
4. Related to high and low frequency ride through tests, document frequency response droops shown in the simulations.

PSCAD Model Requirements Rev. 9

Date: May 8, 2020
Prepared By: Andrew L. Isaacs
Lukas Unruh
Garth Irwin

This document includes the following attachments:

Attachment #1: PSCAD Model Test Checklist

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Introduction

Specific model requirements for a PSCAD study depend on the type of study being done. A study with a scope covering weak system interconnections, ride-through evaluation, short term¹ event response, and fast control interaction with nearby devices (for example) would require a model which has the following characteristics. Some specialty studies may require other features. Refer to “Attachment #1: PSCAD Model Test Checklist” and “Attachment #2: PSCAD Model Requirements Supplier Checklist”, appended to this document, for additional information on how these requirements may applied.

Model Accuracy Features

For the model to be sufficiently accurate, it must:

- A. *Represent the full detailed inner control loops of the power electronics.* The model cannot use the same approximations classically used in transient stability modeling, and should fully represent all fast inner controls, as implemented in the real equipment. Models which embed the actual hardware code into a PSCAD component are currently wide-spread, and this is the recommended type of model.²
- B. *Represent all control features pertinent to the type of study being done.* Examples include external voltage controllers, plant level controllers, customized PLLs, ride-through controllers, SSCI damping controllers and others. As in point A, actual hardware code is recommended to be used for most control and protection features. Operating modes that require system specific adjustment should be user accessible. Plant level voltage control should be represented along with adjustable droop characteristics. If multiple plants are controlled by a common controller, this functionality should be included.
- C. *Represent all pertinent electrical and mechanical configurations.* This includes any filters and specialized transformers. There may be other mechanical features such as gearboxes, pitch controllers, or others which should be modelled if they impact electrical performance within the timeframe of the study. Any control or dynamic features of the actual equipment which may influence behaviour in the simulation period which are not represented or which are approximated should be clearly identified.

¹ Example analysis periods could be 2 to 10 seconds from fault inception. Some studies could require longer periods.

² The model must be a full IGBT representation (preferred), or may use a voltage source representation that approximates the IGBT switching but maintains full detail in the controls. A three phase sinusoidal source representation is not acceptable. Models manually translated block-by-block from MATLAB or control block diagrams may be unacceptable because the method used to model the electrical network and interface to the controls may not be accurate, or portions of the controls such as PLL circuits or protection circuits may be approximated or omitted. Note that firmware code may be directly used to create an extremely accurate PSCAD model of the controls. The controller source code may be compiled into DLLs or binaries if the source code is unavailable due to confidentiality restrictions.

It is not recommended to assemble the model using standard blocks available in the PSCAD master library, as approximations are usually introduced, and specific implementation details for important control blocks may be lost. In addition, there is a significant risk that errors will be introduced in the process of manually assembling the model. For this type of manually assembled model, (not using a direct “real code” embedding process), extra care is required, and validation is required.

- D. *Have all pertinent protections modeled in detail for both balanced and unbalanced fault conditions.* Typically this includes various OV and UV protections (individual phase and RMS), frequency protections, DC bus voltage protections, converter overcurrent protections, and often other inverter specific protections. As in point A, actual hardware code is recommended to be used for these protection features.
- E. *Be configured to match expected site-specific equipment settings.* Any user-tunable parameters or options should be set in the model to match the equipment at the specific site being evaluated, as far as they are known. Default parameters may not be appropriate.

Model Usability Features

In order to allow study engineers to perform system analysis using the model, the PSCAD model must:

- F. *Have control or hardware options which are pertinent to the study accessible to the user.* Examples of this could include protection thresholds, real power recovery ramp rates, or SSCI damping controllers.³ Diagnostic flags (eg. flags to show control mode changes or which protection has been activated) should be visible to aid in analysis.
- G. *Be accurate when running at a simulation time step of 10 μ s or higher.* Often, requiring a smaller time step means that the control implementation has not used the interpolation features of PSCAD, or is using inappropriate interfacing between the model and the larger network. Lack of interpolation support introduces inaccuracies into the model at larger simulation time-steps. In cases where the IGBT switching frequency is so high that even interpolation does not allow accurate switching representation at 10 μ s (eg. 40 kHz), an average source approximation of the inverter switching may be used to allow a larger simulation time step².
- H. *Operate at a range of simulation time steps.* The model should not be restricted to operating at a single time step, but should be able to operate within a range (eg. 10 μ s – 20 μ s)
- I. *Have the ability to disable protection models.* Many studies result in inadvertent tripping of converter equipment, and the ability to disable protection functions temporarily provides study engineers with valuable system diagnostic information.
- J. *Include documentation and a sample implementation test case.* Test case models should be configured according to the site-specific real equipment configuration up to the Point of Interconnection. This would include (for example): aggregated generator model, aggregated generator transformer, equivalent collector branch, main step up transformers, gen tie line, and any other static or dynamic reactive resources. Test case should use a single machine infinite bus representation of the system, configured with an appropriate representative SCR, such as 2.5. Access to technical support engineers is desirable.
- K. *Have an identification mechanism for configuration.* The model documentation should provide a clear way to identify the specific settings and equipment configuration which will be used in any

³ Care should be taken to ensure that any user-settable options are not changed in a way that is not implementable in the real hardware, and that any selectable options are actually available at the specific site being considered. Discussion is recommended with the manufacturer prior to any changes being made in model configuration.

- study, such that during commissioning the settings used in the studies can be checked. This may be control revision codes, settings files, or a combination of these and other identification measures.
- L. *Accept external reference variables.* This includes real and reactive power ordered values for Q control modes, or voltage reference values for voltage control modes. Model should accept these reference variables for initialization, and be capable of changing these reference variables mid-simulation, ie. dynamic signal references.
 - M. *Be capable of initializing itself.* Once provided with initial condition variables, the model must initialize and ramp to the ordered output without external input from simulation engineers. Any slower control functions which are included (such as switched shunt controllers or power plant controllers) should also accept initial condition variables if required.
 - N. *Have the ability to scale plant capacity.* The active power capacity of the model should be scalable in some way, either internally or through an external scaling transformer⁴. This is distinct from a dispatchable power order, and is used for modeling different capacities of plant or breaking a lumped equivalent plant into smaller composite models.
 - O. *Have the ability to dispatch its output to values less than nameplate.* This is distinct from scaling a plant from one unit to more than one, and is used for testing plant behaviour at various operating points.
 - P. *Initialize quickly.* Model must reach its ordered initial conditions as quickly as possible (for example <5 seconds) to user supplied terminal conditions.

Study Efficiency Features

In addition, the following elements are required to improve study efficiency, model compatibility, and enable other studies which include the model to be run as efficiently as possible. If these features are not supported, additional discussion is required⁵:

- Q. Model should be compatible with Intel Fortran compiler version 12 and higher.
- R. Model should be compatible with PSCAD version 4.5.3 and higher.
- S. Model supports multiple instances of its own definition in the same simulation case.
- T. Model supports the PSCAD “timed snapshot” feature accessible through project settings.
- U. Model supports the PSCAD “multiple run” feature.
- V. Model does not use or rely upon global variables in the PSCAD environment.
- W. Model should not utilize multiple layers in the PSCAD environment, including ‘disabled’ layers.

⁴ A free publicly available scaling transformer suitable for this purpose is available in the E-Tran library.

⁵ Electrenix has parallelization tools available (E-Tran Plus for PSCAD) which can circumvent compatibility concerns in some cases.

Attachment #1: PSCAD Model Test Checklist

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Purpose

This document is a test checklist meant to accompany “PSCAD Model Requirements Rev. 9” provided above and “Attachment #2: PSCAD Model Requirements Supplier Checklist”. The procedures provided in this document are intended to provide an indication of the core model accuracy, performance, and usability features specified in the model requirements. These procedures cannot ultimately prove that the model is compliant with all requirements, as black box models usually hide the details of the equipment controls and protection. It is recommended that the equipment manufacturer supply additional confirmation that the model meets each individual requirement. The requirements in this document do not necessarily represent interconnection criteria for specific individual systems, and may be supplemented or adjusted based on interconnection region.

The tests outlined here are considered “basic”, and may be supplemented by more rigorous testing, including various fault types, depths, and durations, as well as more extensive protection testing and benchmarking against phasor models. This document is not intended to be a guide for thorough benchmarking between PSCAD, PSS/E, and actual equipment, and is subject to revision as the state of the art in EMT modeling evolves.

<i>Model test Summary</i>	
Model Test date:	
Project Name:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file:	
Model Files supplied:	

Verification Procedure and Checklist

		Pass/Fail	Comments
<i>Vendor and site specific model verification</i>			
1a	The Vendor's name and the specific version of the model should be clearly observable in the .psc model file.		
1b	Documentation and supporting model filenames should not conflict with model version shown in the .psc model file.		
1c	Model is supplied with a test circuit which is configured for the site specific application. ⁶		
<i>"Real Code" model verification</i>			
2a	Controls are black-boxed, and no PSCAD master library control blocks are visible within control circuits. ⁷ If the model is not based on "real code", a separate validation report is required showing model comparison against hardware tests. ⁸		
<i>Model usability verification</i>			
3a	Model uses a timestep greater than 10 μs ⁹		
3b	Model allows a variation in simulation timestep		
3c	Model compiles using Intel FORTRAN version 12		
3d	Model initializes in 5 seconds or less with a POI level SCR of 2.5. Real power, reactive power, and RMS voltage should reach steady state by this time.		
3e	Model allows multiple instances of itself to be run together in the same case ¹⁰		
<i>Model electrical configuration verification</i>			
4a	Plant level electrical single line diagram (SLD) is included.		

⁶ The test circuit should model all relevant electrical components of the plant and contain a system equivalent. Parameters will be assumed to be site-specific, unless there are obvious indications otherwise, such as an incorrect grid base frequency.

⁷ Black-boxing of controls to a high level does not guarantee that real-code is embedded into the model, however the visibility of PSCAD master-library control blocks in the inner control loops (PLL, inner current controllers, etc.) suggest that the model is generic in nature. Model documentation may contain information on use of real-code in the model.

⁸ All aspects of the controller operation are required to be validated by utilizing a "hardware in loop" platform or other hardware test systems. Model should not be validated against other software models. Validations should include control responses to various types of faults, changes in power and voltage references, changes in system frequency, testing frequency response in sub and super-synchronous ranges, and testing of protection operation. Tests should also be performed under a variety of system strengths, including very weak systems. Other tests may also be required. The validation report is required along with any model updates that result from the more rigorous validation tests.

⁹ Models with timesteps less than 10 μs may be acceptable in situations where a small timestep does not significantly increase the runtime of the total simulation

¹⁰ Depending on specific application and whether E-Tran Plus for PSCAD is allowed to be used to overcome the limitation, this requirement may be waived.

**PSCAD Model Requirements Rev. 9
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4b	Generator step-up transformer(s) included, with impedance between 5 and 10% on generator base, and matches SLD. ¹¹		
4c	Lumped collector equivalent(s) included, with total charging equal to between 0.5 and 5% of plant rating, and matches SLD. ¹¹		
4d	Substation transformer(s) included, rated appropriately for plant size, and impedance between 6 and 12% on transformer base, and matches SLD. ¹¹		
4e	Model can be scaled to represent any number inverters/turbines, either using a scaling transformer or internal scaling.		
4f	All external devices included in the plant (such as STATCOMs) include appropriate models.		
<i>Plant controller verification</i>			
5a	Model includes power plant controller (PPC)		
5b	PPC accepts an external active power setpoint.		
5c	PPC accepts a voltage setpoint.		
5d	PPC has a mechanism to implement a settable voltage droop.		
5e	Overall plant responds to frequency changes by increasing or decreasing its active power as appropriate. This may be accomplished either at an inverter level or via the PPC. ¹²		
5f	Model initializes to the setpoints specified in the PPC. If droops or deadbands are utilized, the initial values may differ from the setpoints. ¹³		
5g	If external voltage control devices (STATCOM/DVAR, SVC, MSCs) are included in the plant, ensure that the voltage control of these devices is coordinated with the PPC, with no potential for VAR looping or oscillations.		
<i>Basic performance verification¹⁴</i>			
6a	Instantaneous voltage and current waveforms have minimal distortion, and no oscillations are observed.		

¹¹ Impedance range is for sanity checking only. Impedances outside this range may be allowed.

¹² Non-compliance with this item may not require model revision as frequency response may not be required in PSCAD models by some utilities. In this case, a description of the under/over frequency response capabilities of the actual equipment should be provided by the manufacturer.

¹³ If voltage control with droop is implemented, it is preferred that the PPC model requests an initial Q value to match the voltage setpoint. If no initial Q is requested, the voltage setpoint can be biased by the initial Q before it is sent to the PPC. If a non-zero deadband is included in the voltage controller, the deadband can also be considered in the voltage setpoint sent to the PPC.

¹⁴ Performance testing is recommended with a POI level SCR of 2.5 as this is a representative system condition seen during weak system studies. Testing may be performed at higher SCRs if the stable operating SCR of a model is known to be above 2.5.

**PSCAD Model Requirements Rev. 9
May 8, 2020**



6b	Model is able to ride-through and recover from a temporary (no line outage or drop in SCR), 6-cycle, zero-impedance, three-phase fault at the high side of the station transformer, with a POI level SCR of 2.5.		
6c	Model responds to a step change in PPC voltage setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. (Various systems may have specific speed requirements, which should be met)		
6d	Model responds to a step change in PPC active power setpoint, reaching 90% of the new value between 1 and 10 seconds in a test system with POI level SCR of 2.5. ¹⁵		
<i>Basic protection verification</i> ¹⁶			
7a	Protection settings are implemented. These could be available as inputs in the model, or hard-coded in the black-boxed controls. ¹⁷		
7b	Option to disable protection models is present. ¹⁸		
7c	Model trips or blocks when terminal voltage rises above 1.3 pu for 1.5 second. ¹⁹		
7d	Model trips or blocks when terminal voltage falls below 0.2 pu for 1.5 second. ¹⁹		
7e	Model clearly displays trip / diagnostic signals indicating the status of all pertinent protection elements		
<i>Documentation</i>			
8a	Model documentation states compliance with "PSCAD Model Requirements Rev. 9 Rev. 9" ²⁰ , or is supplied with a completed PSCAD Model Requirements Supplier Checklist.		
8b	Model documentation includes instructions for setup and running of the model, including the recommended range of simulation timesteps. Documentation should give a clear description of trip / operation code signals produced by model.		

¹⁵ Different response time criteria may apply depending on specific interconnection region.

¹⁶ There are many protection functions which should be modelled, per footnote 1, and these basic tests will not be proof that these are modelled.

¹⁷ If settings are not visible in model or documentation, verification that protection settings are implemented in the PSCAD model should be received from the manufacturer.

¹⁸ Non-compliance may not require model revision as many studies do not require testing with protection settings disabled.

¹⁹ Non-compliance with this item should result in verification of protection settings implementation from the manufacturer, as some models may have capabilities beyond what is listed here.

²⁰ Non-compliance may be waived in systems which do not require compliance with the model requirements document.

Attachment #2: PSCAD Model Requirements Supplier Checklist

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Purpose

This document is a model requirements checklist which should be completed by the supplier of the model and submitted alongside each PSCAD model. This document accompanies the “PSCAD Model Requirements Rev. 9” document above (PMR), which should be used for further reference to describe the requirements associated with each point. Generic testing of the model may be done using “Attachment #1: PSCAD Model Test Checklist”, which may be used as a reference.

Model supplier must review every item in the checklist and indicate compliance for each item. If the supplied model does not meet any of the requirements an explanation of the deficiency should be provided in the comments column.

<i>Model Submission Summary (to be completed by model supplier)</i>	
Submission date:	
Project Name:	
Primary contact information for model related questions:	
Secondary contact information for model related questions:	
Manufacturer:	
Equipment type: (eg. PV or Wind)	
Equipment version:	
Documentation file(s):	
Model Files supplied:	

**Recommended PSCAD Model Requirements Rev. 9
May 8, 2020**



Model Requirements Checklist		PMR Reference	Model Complies? (Yes/No)	Comments
1 Model Accuracy Features				
1.1	Power electronic controls are modelled by interfacing with actual firmware code from the inverter (“real code” model), or includes detailed validation report.	A, B		
1.2	Operating modes which require system specific adjustment are accessible.	B		
1.3	Plant level controller is included. ²¹	B		
1.4	Model is capable of controlling frequency ²²	B		
1.5	Includes pertinent electrical and mechanical features, such as gearboxes, pitch controllers, or other features which impact the plant performance in the simulation period. ²³	C		
1.6	All protections which could impact ride-through performance are modelled in detail.	D		
1.7	Model is configured for the specific site being evaluated, as far as they are known.	E		
2 Model and Project Documentation				
2.1	Model includes documentation.	J		
2.2	Documentation includes instruction for setup and running the model.	J		

²¹ If the plant is part of a multi-plant control scheme, a description of the overall scheme should be provided, and corresponding PPC models should be configured to control multiple plants accordingly.

²² Frequency control model requirements may vary by region. Example response time may be less than 10 seconds.

²³ Simulation period may vary depending on the model use, but 10 seconds of simulation following an event such as a fault is a typical period.

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Recommended PSCAD Model Requirements Rev. 9
May 8, 2020



2.3	Model is supplied with a sample test case including site specific plant representation.	J	
2.4	Plant single line diagram is provided, and aligns with model	J	
2.5	Model documentation provides a clear way to identify site-specific settings and equipment configuration.	K	
3	<i>Model Usability Features</i>		
3.01	Control or hardware options are accessible to the user as applicable.	F	
3.02	Diagnostic flags are visible to the user.	F	
3.03	Model uses a timestep greater than 10 μ s.	G	
3.04	Model allows a range of simulation timesteps (ie. not restricted to a single timestep).	H	
3.05	Protection model may be disabled for troubleshooting	I	
3.06	Model accepts external reference variables for active and reactive power and voltage setpoint, and these may be changed dynamically during the simulation.	L	
3.07	Model is capable of initializing itself.	M	
3.08	Active power capacity is scalable.	N	
3.09	Active power is dispatchable.	O	
3.10	Model reaches setpoint P, Q, and V in 5 seconds or less	P	
3.11	Model compatible with Intel FORTRAN version 12 and higher.	Q	
3.12	Model compiles using PSCAD version 4.5.3 or higher.	R	
3.13	Model supports multiple instances of its own definition in a single PSCAD case.	S	
3.14	Model supports PSCAD "snapshot" feature.	T	

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**Recommended PSCAD Model Requirements Rev. 9
 May 8, 2020**



3.15	Model supports the PSCAD “multiple run” feature.	U	
3.16	Model does not use PSCAD global variables.	V	
3.17	Model does not use PSCAD layer functionality	W	

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DETAILED INSTRUCTIONS FOR COMMUNITY OUTREACH PLAN

- The Community Outreach Plan should be as current and explanatory as possible.
 - The Community Outreach Plan information must be included in the information Proposers selected to the Final Award Group make available on their website when the website is posted publicly.
- Proposers selected to the Final Award Group must develop a public Project website, which shall include all the information on the Community Outreach Plan table for their Project.
- Proposers must develop Project presentations that include all the information on the Community Outreach Plan table (sample template provided).
- Due to the uncertainty of the duration of the COVID-19 pandemic, all Proposers are required to plan for both in-person and virtual community meetings. As we near the dates that community meetings are scheduled, in the interest of public health and safety, the conditions at the time will determine if in-person meetings or virtual meetings will be required.
 - Virtual community meetings can either be community televised, or online, but must incorporate technology that allows for live engagement and interaction between the Proposer and community participants.
- Proposers must communicate important information about the Project with stakeholders in advance of community meetings.
- Proposers must perform media outreach (earned media) and advertising (paid media) to raise community awareness of any public meeting. Media advisories (sample attached) must be issued to the following media and organizations a minimum of 30 days prior to a public meeting. Media advisories do not need to be reviewed and approved by Hawaiian Electric, but must be shared with Hawaiian Electric for awareness.
 - For Oahu Projects
 - Star Advertiser
 - Civil Beat
 - Hawaii News Now
 - KHON2 News
 - KITV4 News
 - Neighborhood Boards
 - For Maui Projects
 - Maui News
 - Maui Now
 - Civil Beat
 - Hawaii News Now
 - KHON2 News
 - KITV4 News
 - For Hawaii Island Projects
 - Hawaii Tribune Herald
 - West Hawaii Today
 - Civil Beat
 - Hawaii News Now
 - KHON2 News
 - KITV4 News
- Advertisements must be placed in area community publications.
 - Guidance from the Company can be provided upon request

- Information in the ads must be consistent with the media advisory
- Public comments in support and in opposition to the proposed Project must be compiled and filed verbatim with the Public Utilities Commission.
- Proposers must work with and inform neighboring communities and stakeholders to provide community members timely information during ALL phases of the project, which must include, but not be limited to the Power Purchase Agreement negotiation period, the permitting process periods, and throughout construction.
- Should any COVID-19 related events interfere with the Proposer's ability to perform the listed actions, Proposer should inform the Company immediately of such effects for Company's consideration and guidance, and possible proposal of alternate actions.

CONTACT: **NAME, 808.XXX.XXXX** **FOR IMMEDIATE RELEASE**
Email address Date

Media Advisory: Title

Project description to be drafted by developer. Description must include the location of proposed project and supporting background information.

Date: TBD

Time: TBD

Location: TBD

Purpose: To share information about a **TYPE (e. g. CBRE solar, etc.)** renewable energy project proposed to be developed in **COMMUNITY** near **AREA REFERENCE** and to solicit public comments to be filed with the Public Utilities Commission.

Contact: For more information, call **808.XXX.XXXX** or visit **(website/social media)**

###

Project Name

Proposer Name

Project Benefits

Details

Community Benefits

Details

Proposed Facility Location in/near what City/Area

Map

Dimensions of proposed project

Include all project components

Project Description

Details

Site Layout Plan

Project Layout

Project Visual Simulations

- Multiple public vantage points

Interconnection Route

Map

Required Government Permits and Approvals

Preliminary Schedule

Opportunities for public comment

Environmental Impacts

Preliminary environmental assessment of the site (including any pre-existing environmental conditions)

Cultural Impacts

Identify any cultural, historic or natural resources that will be impacted by the project

Describe the potential impacts on these resources

Identify measures to mitigate such impacts.

Where to Find More Information

Project website

Proposer email and contact information

How to Provide Comments

CBRE Stage 2 Model and Interconnection Requirements Study (IRS) Scope

Island	Lānaʻi														
Size	≥ 1MW Connecting to Miki Basin Switchyard (Lanai) Single Project														
Models	PSS®E Generic, PSS®E User Defined, PSCAD, and ASPEN., Grid Forming PSCAD, and Grid Forming PSS®E														
System Impact Study Scope	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th style="text-align: center;">Tasks</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(Include selected tasks in the IRS. Exclude tasks that are unselected)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Interconnection One-Line, Three-Line, and Equipment List</td> </tr> <tr> <td><input checked="" type="checkbox"/> Project Data Requirements and Facility Technical Model Review</td> </tr> <tr> <td><input checked="" type="checkbox"/> Review of Existing System Performance (Base-Case)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Develop Project Model (IRS Case)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Steady-State Power Flows <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Reverse Power Flow <input checked="" type="checkbox"/> Reactive Power Requirements </td> </tr> <tr> <td><input checked="" type="checkbox"/> Protection Review</td> </tr> <tr> <td><input checked="" type="checkbox"/> Voltage Flicker</td> </tr> <tr> <td><input checked="" type="checkbox"/> Voltage Transients (In-Rush Current)</td> </tr> <tr> <td><input checked="" type="checkbox"/> System Stability <ul style="list-style-type: none"> <input checked="" type="checkbox"/> PSSE Analyses <input checked="" type="checkbox"/> PSCAD Analyses for Weak Grid Conditions <input checked="" type="checkbox"/> Grid Forming Analyses </td> </tr> <tr> <td><input checked="" type="checkbox"/> Ride-Through Requirements</td> </tr> <tr> <td><input checked="" type="checkbox"/> Unintended Islands <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Transient Overvoltage (TrOV) <input checked="" type="checkbox"/> Unintended Islands Fault Overvoltage (GFOV) </td> </tr> <tr> <td><input type="checkbox"/> Harmonics <ul style="list-style-type: none"> <input type="checkbox"/> Harmonics Model Analysis <input type="checkbox"/> Harmonics Monitoring Assessment </td> </tr> </tbody> </table> <p>Note:</p> <ol style="list-style-type: none"> If an IRS is determined to not be necessary, a technical model checkout will still be required per Section 5.1.1 of the RFP. 	Tasks	(Include selected tasks in the IRS. Exclude tasks that are unselected)	<input checked="" type="checkbox"/> Interconnection One-Line, Three-Line, and Equipment List	<input checked="" type="checkbox"/> Project Data Requirements and Facility Technical Model Review	<input checked="" type="checkbox"/> Review of Existing System Performance (Base-Case)	<input checked="" type="checkbox"/> Develop Project Model (IRS Case)	<input checked="" type="checkbox"/> Steady-State Power Flows <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Reverse Power Flow <input checked="" type="checkbox"/> Reactive Power Requirements 	<input checked="" type="checkbox"/> Protection Review	<input checked="" type="checkbox"/> Voltage Flicker	<input checked="" type="checkbox"/> Voltage Transients (In-Rush Current)	<input checked="" type="checkbox"/> System Stability <ul style="list-style-type: none"> <input checked="" type="checkbox"/> PSSE Analyses <input checked="" type="checkbox"/> PSCAD Analyses for Weak Grid Conditions <input checked="" type="checkbox"/> Grid Forming Analyses 	<input checked="" type="checkbox"/> Ride-Through Requirements	<input checked="" type="checkbox"/> Unintended Islands <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Transient Overvoltage (TrOV) <input checked="" type="checkbox"/> Unintended Islands Fault Overvoltage (GFOV) 	<input type="checkbox"/> Harmonics <ul style="list-style-type: none"> <input type="checkbox"/> Harmonics Model Analysis <input type="checkbox"/> Harmonics Monitoring Assessment
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Reference Single Line Diagram (See Appendix H)	See Single Line Diagram for each respective site														

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

MARCH 30, 2021

Docket No. 2015-0389

Appendix C – Code of Conduct Procedures Manual

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix C – Code of Conduct Procedures Manual, Exhibit 5 of the March 30, 2021 filing]



**Maui
Electric**

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

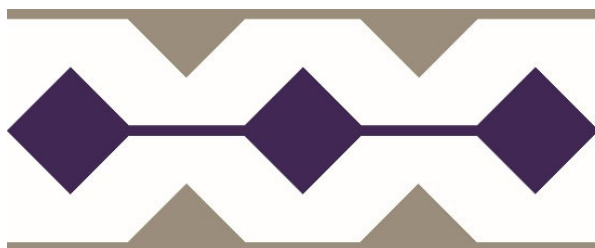
ISLAND OF LĀNA‘Ī

MARCH 30, 2021

Docket No. 2015-0389

Appendix D – PowerAdvocate User Information

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix D – PowerAdvocate User Information, Exhibit 5 of the March 30, 2021 filing]



**Maui
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REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNAʻI

MARCH 30, 2021

Docket No. 2015-0389

*Appendix E – Mutual Confidentiality and
Non-Disclosure Agreement*

**[NOTE: Please refer to Draft Request for Proposals for Community-Based
Renewable Energy Projects for Low- and Moderate-Income Subscribers,
Appendix E – Mutual Confidentiality and Non-Disclosure Agreement, Exhibit
5 of the March 30, 2021 filing]**



**Maui
Electric**

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

MARCH 30, 2021

Docket No. 2015-0389

Appendix F – Description of the Pūlama Site



**Maui
Electric**

**APPENDIX F
VARIABLE RENEWABLE DISPATCHABLE GENERATION
DESCRIPTION OF THE PŪLAMA SITE**

Pūlama Site

All proposals submitted in response to this RFP must be sited at the Pūlama Site which is an undeveloped site located adjacent to Miki Road, less than 1 mile from the airport. The site is adjacent to the Company's Miki Basin Plant allowing for strategic interconnection to the switchyard. A map of the available area is included as Attachment 1 to this Appendix F. A draft copy of the proposed form of the lease and lease term sheet are included as Attachment 2 and Attachment 3, respectively, to this Appendix F. The terms of the lease will be negotiable with the landowner, Pūlama Lāna'i.

Proposers must include the cost for interconnecting into the switchyard in their Proposals.

Additional Information

Pūlama Lāna'i commissioned an Environmental Assessment (EA) of the Pūlama Site in compliance with HRS Chapter 343. Information on the EA is provided for use at Proposer's sole discretion at:

<https://luc.hawaii.gov/pending-petitions-2/boundary-amendments/a19-809-lanai-resorts-llc-dba-pulama-lanai/a19-809-lanai-resorts-llc-dba-pulama-lanai-miki-basin-enviromental-assessment-2020/>

Additionally, the following links to a few publicly available resources relating to renewable energy project permitting and collaboration from the Hawaii State Energy Office are being provided for use at Proposers' sole discretion:

Project Permitting Assistance and Resources

<http://energy.hawaii.gov/developer-investor/project-permitting-assistance-and-resources>

Provides numerous resources to support more informed and appropriate project siting and permitting, including the Permit Guide, Renewable Energy Permitting Consultants, DOH, ePermitting Portal, Renewable EnerGIS, Permitting Wizard, and the Renewable Energy Projects Directory.

Aloha Aina: A Framework for Biocultural Resource Management in Hawai'i's Anthropogenic Ecosystems

https://nmshawaiihumpbackwhale.blob.core.windows.net/hawaiihumpbackwhale-prod/media/archive/council/pdfs/aloha_aina.pdf

A framework developed by the Hawaiian Islands Humpback Whale National Marine Sanctuary Advisory Council to integrate Native Hawaiian and Western scientific management approaches toward ecosystem management. While intended for the Sanctuary, this document provides useful insight into successful collaboration in Hawaii.





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Attachments:

Exhibit A	Legal Description
Exhibit B	Estoppel Certificate
Exhibit C	Guaranty

GROUND LEASE

BETWEEN

LĀNA‘I RESORTS, LLC

as Landlord

AND

as Tenant

FOR PREMISES LOCATED AT:

Lāna‘i City, Lāna‘i

Tax Map Key No. (2) 4-9-002:061 (por)

[This form of Ground Lease is included in the Request for Proposals for general information only. Landlord reserves the right to revise the Ground Lease to conform to, among other things, the location of the Premises and the Project.]

GROUND LEASE

THIS GROUND LEASE (the “**Lease**”) is made and entered into as of _____, 20__ (the “**Commencement Date**”), between **LĀNA‘I RESORTS, LLC**, a Hawaii limited liability company (“**Landlord**”), and _____, a _____ (“**Tenant**”).

Recitals:

(a) At the Commencement Date, Landlord owns the following real property (collectively, the “**Premises**”): (i) the unsubdivided land described in **Exhibit A**, consisting of approximately 73 acres of land (the “**Land**”) together with an easement over a roadway (the “**Roadway**”); (ii) all buildings, structures, and other improvements and appurtenances located on the Land other than any buildings, structures and other improvements or appurtenances that may have been constructed by on or behalf of Tenant prior to the commencement date; and (iii) the appurtenances and all the estate and rights of Landlord in and to the Land.

b) Tenant and Maui Electric Company, Limited (“**MECO**”) have entered into a Power Purchase Agreement for Variable Renewable Dispatchable Generation dated as of _____, 20__ between MECO, as Company, and Tenant, as Seller, as it may be Modified (the “**Power Purchase Agreement**”).

(c) In connection with the Power Purchase Agreement, and in order to fulfill its obligations under the Power Purchase Agreement, Tenant desires to lease the Premises from Landlord, and Landlord is willing to lease the Premises to Tenant.

Agreements:

NOW, THEREFORE, for good and valuable consideration, Landlord leases and demises the Premises to Tenant, and Tenant takes and hires the Premises from Landlord, subject only to Permitted Exceptions, for the Term, upon the terms and conditions of this Lease.

1. DEFINITIONS

1.1 **Terms not Defined in Lease.** Capitalized terms not defined in this Lease have the meanings given in the Power Purchase Agreement, unless the context clearly indicates otherwise. For example, the following terms used in this Lease are defined in the Power Purchase Agreement: “Extension Term,” “Facility,” “Financing Parties” and “Good Engineering and Operating Practices.”

1.2 **Terms Defined in Lease.** The following definitions apply in this Lease.

“Additional Rent” means all sums that this Lease requires Tenant to pay Landlord or a third party, whether or not expressly called Additional Rent, except Fixed Rent.

“Affiliate” of any specified Person means any other Person Controlling or Controlled by or under common Control with such specified Person. *“Affiliated”* shall have the correlative meaning.

“Application” means any agreement, application, certificate, document, or submission (or amendment of any of the foregoing :

(a) necessary or appropriate for any Construction this Lease allows, including any application for any building permit, certificate of occupancy, utility service or hookup, easement, covenant, condition, restriction, subdivision plat, or such other instrument as Tenant may from time to time reasonably request for such Construction;

b) to allow Tenant to obtain any abatement, deferral, or other benefit otherwise available for Real Estate Taxes;

(c) to enable Tenant from time to time to seek any Approval or to use and operate the Premises in accordance with this Lease; or

(d) otherwise reasonably necessary and appropriate to permit Tenant to realize the benefits of the Premises under this Lease.

“Approvals” means any and all licenses, permits (including building, demolition, alteration, use, and special permits), approvals, consents, certificates (including certificate(s) of occupancy), rulings, variances, authorizations, or amendments to any of the foregoing as shall be necessary or appropriate under any Law to commence, perform, or complete any Construction, or for the zoning, rezoning (to the extent this Lease allows), use, occupancy, maintenance, or operation of the Premises, including approval of the State Public Utilities Commission.

“Bankruptcy Law” means Title 11, United States Code, and any other or successor state or federal statute relating to assignment for the benefit of creditors, appointment of a receiver or trustee, bankruptcy, composition, insolvency, moratorium, reorganization, or similar matters.

“Bankruptcy Proceeding” means any proceeding, whether voluntary or involuntary, under any Bankruptcy Law.

“Bankruptcy Sale” means a sale of any property, or any interest in any property, under 11 U.S.C. §363 or otherwise in any bankruptcy, insolvency, or similar proceeding affecting the owner of such property.

“**Baseline Assessment**” means a [Phase I and/or Phase II] Environmental Report dated _____, 20__ made by _____, revealing the environmental conditions of the Land and Premises as of the Commencement Date.

“**Business Day**” means any weekday on which State-chartered banks are open to conduct regular banking business with bank personnel.

“**Casualty**” means any damage or destruction of any kind or nature, ordinary or extraordinary, foreseen or unforeseen, affecting any or all Improvements, whether or not insured or insurable.

“**Casualty Termination**” means a termination of this Lease because of a Substantial Casualty, when and as this Lease expressly allows such a termination. Tenant’s election of a Casualty Termination shall not be effective without Leasehold Mortgagee’s consent.

“**Certifying Party**” shall have the meaning set forth in Section 23.1 hereof.

“**Clean-up**” shall have the meaning set forth in Section 10.11.1 hereof.

“**Condemnation**” means: a) any temporary or permanent taking of (or of the right to use or occupy) any Premises by condemnation, eminent domain, or any similar proceeding; or b) any action by any Government not resulting in an actual transfer of an interest in (or of the right to use or occupy) any Premises but creating a right to compensation, such as a change in grade of any street upon which the Premises abut.

“**Condemnation Award**” means any award(s) paid or payable (whether or not in a separate award) to either party or its mortgagee after the Commencement Date because of or as compensation for any Condemnation, including: (a) any award made for any improvements that are the subject of the Condemnation; b) the full amount paid or payable by the condemning authority for the estate that is the subject of the Condemnation, as determined in Condemnation; (c) any interest on such award; and (d) any other sums payable on account of such Condemnation, including for any prepayment premium under any mortgage.

“**Condemnation Effective Date**” means, for any Condemnation, the first date when the condemning authority has acquired title to or possession of any Premises subject to the Condemnation.

“**Confidential Information**” shall have the meaning set forth in Section 26.1 hereof.

“**Construction**” means any alteration, construction, demolition, development, expansion, reconstruction, redevelopment, repair, Restoration, or other work affecting any Improvements, including the Facility and any other new construction.

“**Contest**” shall have the meaning set forth in Section 12.1 hereof.

“**Contest Conditions**” shall have the meaning set forth in 12.1 hereof.

“**Contest Security**” shall have the meaning set forth in 12.1.1 hereof.

“**Control**” means possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether by ownership of Equity Interests, by contract, or otherwise.

“**County**” means the County of Maui.

“**CPI**” means the United States Department of Labor, Bureau of Labor Statistics “Consumer Price Index” for Urban Wage Earners and Clerical Workers (CPI-W) published for Honolulu, with a base of 1982-1984 = 100. If the CPI ceases to be published, with no successor index, then the parties shall reasonably agree upon a reasonable substitute index. The CPI for any date means the CPI last published before the calendar month that includes such date.

“**CPI Adjustment Factor**” means, as of any date, the greater of (a) 1.00 or (b) the CPI for such date divided by the CPI for the Commencement Date.

“**Default**” means any Monetary Default or Nonmonetary Default.

“**Default Interest**” means interest at an annual percentage rate per annum equal to the average daily Prime Rate for the period in question plus four (4) percentage points.

“**Depository**” means an FDIC insured financial institution with its principal office in the State, designated by a Leasehold Mortgagee or, if no Leasehold Mortgage exists, then by Landlord).

“**Discovered Items**” shall have the meaning set forth in Section 25.1 hereof.

“**Environmental Law**” means any Law regarding the following at, in, under, above, or upon the Premises: (a) air, environmental, ground water, or soil conditions; or (b) clean-up, control, disposal, generation, storage, release, transportation, or use of, or liability or standards of conduct concerning, Hazardous Substances.

“**Environmental Report**” shall have the meaning set forth in Section 10.11.1 hereof.

“**Equity Interest**” means all or any part of any direct or indirect equity or ownership interest(s) whether stock, partnership interest, beneficial interest in a trust, membership interest, or other interest of an ownership or equity nature) in any entity at any tier of ownership that directly or indirectly owns or holds any ownership or equity interest in Tenant.

“**Estoppel Certificate**” means a statement, addressed either to Landlord or Tenant or as directed, in substantially the form of **Exhibit B**, and containing other assurances as Landlord or Tenant reasonably requests.

“**Event of Default**” shall have the meaning set forth in Section 19.1 hereof.

“**Expiration Date**” means the date when this Lease terminates or expires in accordance with its terms, whether on the Scheduled Expiration Date, by Landlord’s exercise of remedies for an Event of Default, or otherwise.

“**Facility**” means the Facility as described in the Power Purchase Agreement, as it may be Restored, modified, expanded or changed from time to time.

“**Fee Debt Service**” means all payments required from time to time under any Fee Mortgage, including principal, interest, late charges, costs of collection, reimbursement of protective advances, and any other sums any Fee Mortgage secures.

“**Fee Estate**” means Landlord’s fee estate in the Premises, including Landlord’s reversionary interest in the Premises after the Expiration Date.

“**Fee Mortgage**” means any mortgage, collateral assignment, or other lien (as modified from time to time) encumbering all or part of the Fee Estate.

“**Fee Mortgagee**” means a holder of a Fee Mortgage (and its successors and assigns).

“**Fixed Rent**” shall have the meaning set forth in Section 3.1 hereof.

“**Foreclosure Event**” means any: (a) foreclosure sale (or assignment in lieu of foreclosure, Bankruptcy Sale, or similar transfer) affecting the Leasehold Estate; or (b) Leasehold Mortgagee’s exercise of any other right or remedy under a Leasehold Mortgage or applicable Law) that divests Tenant of its Leasehold Estate.

“**GET**” shall have the meaning set forth in Section 4.8 hereof.

“**Government**” means each and every governmental agency, authority, bureau, department, quasi-governmental body, or other entity or instrumentality having or claiming jurisdiction over the Premises (or any activity this Lease allows), including the United States government, the State and County governments and their subdivisions and municipalities, and all other applicable governmental agencies, authorities, and subdivisions thereof. “Government” shall also include any land use commission, planning commission, board of standards and appeals, department of buildings, city council, zoning board of appeals, or similar body having or claiming jurisdiction over the Premises or any activities on or at the Premises.

“**Guarantor**” means _____.

“Hazardous Substances” includes flammable substances, explosives, radioactive materials, asbestos, asbestos-containing materials, polychlorinated biphenyls, chemicals known to cause cancer or reproductive toxicity, pollutants, contaminants, hazardous wastes, medical wastes, toxic substances or related materials, petroleum and petroleum products, and any “hazardous” or “toxic” material, substance or waste that is defined by those or similar terms or is regulated as such under any Law, including any material, substance or waste that is: (a) defined as a “hazardous substance” under Section 311 of the Water Pollution Control Act (33 U.S.C. §1317), as amended; b) defined as a “hazardous waste” under Section 1004 of the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §6901, et seq., as amended; (c) defined as a “hazardous substance” or “hazardous waste” under Section 101 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Reauthorization Act of 1986, 42 U.S.C. §9601 et seq. or any so-called “superfund” or “superlien” law; (d) defined as a “pollutant” or “contaminant” under 42 U.S.C. §9601(33); (e) defined as “hazardous waste” under 40 C.F.R. Part 260; (f) defined as a “hazardous chemical” under 29 C.F.R. Part 1910; or (g) subject to any other Law regulating, relating to or imposing obligations, liability or standards of conduct concerning protection of human health, plant life, animal life, natural resources, property or the enjoyment of life or property free from the presence in the environment of any solid, liquid, gas, odor or any form of energy from whatever source.

“Hazardous Substances Claims” means (a) any actual, alleged or threatened Hazardous Substances Discharge; b any and all enforcement, cleanup, removal, mitigation, remediation or other Government actions instituted, contemplated or threatened pursuant to Environmental Law affecting the Premises; and (c) all claims made or threatened by any third party against Tenant or the Premises relating to damage, contribution, cost recovery, compensation, loss or injury resulting from any Hazardous Substances.

“Hazardous Substances Discharge” means any deposit, discharge, generation, release, or spill of Hazardous Substances that occurs at or from the Premises, or into the Land, or that arises at any time from the use, occupancy, or operation of the Premises or any activities conducted therein or any adjacent or nearby real property, or resulting from seepage, leakage, or other transmission of Hazardous Substances from other real property to the Land, whether or not caused by a party to this Lease and whether occurring before or after the Commencement Date.

“Immaterial Loss” means a Casualty or Condemnation whose estimated cost to Restore or value does not exceed \$100,000.00, adjusted annually by the CPI Adjustment Factor.

“Improvements” means all buildings, structures, and other improvements and appurtenances located or to be located on the Land from time to time, including the Facility and the landscape buffer described in Section 8.3.

“**Indemnify**” means, where this Lease states that any Indemnitor shall “Indemnify” any Indemnitee from, against, or for a particular matter (the “**Indemnified Risk**”), that the Indemnitor shall indemnify the Indemnitee and defend and hold the Indemnitee harmless from and against any and all loss, cost, claims, liability, penalties, judgments, damages, and other injury, detriment, or expense (including Legal Costs, interest and penalties) that the Indemnitee suffers or incurs: (a) from, as a result of, or on account of the Indemnified Risk; or b) in enforcing the Indemnitor’s indemnity. Counsel retained by Indemnitor to fulfill its obligation to defend Indemnitee(s) shall be subject to Indemnitee’s approval, not to be unreasonably withheld.

“**Indemnitee**” means any party entitled to be Indemnified under this Lease and its agents, directors, employees, Equity Interest holders, mortgagees, and officers.

“**Indemnitor**” means a party that agrees to Indemnify any other Person.

“**Initial Term**” shall have the meaning set forth in Section 2.1 hereof.

“**Insubstantial Condemnation**” means any Condemnation except a Substantial Condemnation, a Temporary Condemnation, or an Immaterial Loss.

“**Land Value**” means, as of the date of a PPA Disconnect or commencement of a Holding Over under Sections 10.11.5, 19.6, or 20.2 hereof, whichever is applicable, the fair market value of the Land as determined by Landlord in good faith. The fair market value of the Land means the amount that a willing buyer would pay a willing seller for the Land, neither being under a particular compulsion to buy or to sell, each fully aware of all applicable facts about the Land, and assuming a reasonable marketing period, considered as if the Land were vacant and clear of any structures or excavations, and free and clear of all leases including this Lease), taking into account then-current general economic conditions; costs of construction; sales of comparable parcels; the real estate marketplace; and all other conditions as in effect on the determination date that may reasonably be considered in determining the fair market value of the Land. Land Value shall otherwise be determined in accordance with prevailing standards of appraisal practice at the time of determination.

“**Landlord**” initially means the Landlord named in the opening paragraph of this Lease. After every transfer of the Fee Estate, “Landlord” means only the owner(s) of the Fee Estate at the time in question. If any former Landlord no longer has any interest in the Fee Estate or a Transfer of the Fee Estate occurs, the Transferor (including a Fee Mortgagee, or anyone acting for a Fee Mortgagee, that has acquired and then disposed of the Fee Estate) shall be and hereby is entirely freed and relieved of all obligations of Landlord under this Lease accruing from and after the date of such Transfer.

“**Laws**” means all laws, ordinances, requirements, orders, proclamations, directives, rules, and regulations of any Government affecting the Premises, this Lease, or any Construction in any way, including any use, maintenance, taxation, operation, or occupancy of, or environmental conditions affecting, the Premises, or relating to any

State or County land use and zoning, any Real Estate Taxes, or otherwise relating to this Lease or any party's rights and remedies under this Lease, or any Transfer of any of the foregoing, whether in force at the Commencement Date or passed, enacted, or imposed at some later time, subject in all cases, however, to any applicable waiver, variance, or exemption.

“Lease Impairment” means Tenant's: (a) canceling, Modifying, restating, surrendering, or terminating this Lease, including upon Loss; b) consenting, or failing to object, to a Bankruptcy Sale of any Premises; (c) determining that a Total Loss has occurred; (d) exercising any right to treat this Lease as terminated under 11 U.S.C. §365(h) 1) A i) or any comparable provision of Law; e) subordinating this Lease or the Leasehold Estate to any other estate or interest in the Premises; or f) waiving any term(s) of this Lease.

“Lease Termination Notice” means a Notice stating this Lease has been terminated, and describing in reasonable detail any uncured Defaults.

“Lease Year” means: a) the twelve calendar months starting on the first day of the first full calendar month after the Commencement Date; and b) every subsequent period of twelve calendar months during the Term.

“Leasehold Estate” means Tenant's leasehold estate, and all of Tenant's rights, privileges, and Pre-Emptive Rights, under this Lease, upon and subject to all the terms and conditions of this Lease, and any direct or indirect interest in such leasehold estate.

“Leasehold Mortgage” means any mortgage, collateral assignment, or other lien as modified from time to time encumbering this Lease and the Leasehold Estate, made in connection with permitted financing under the Power Purchase Agreement to a Financing Party under the Power Purchase Agreement. A Leasehold Mortgage shall not attach to the Fee Estate.

“Leasehold Mortgagee” means a holder of a Leasehold Mortgage (and its successors and assigns), provided: (a) it is a Financing Party under the Power Purchase Agreement; (b) it is not an Affiliate of Tenant; and (c) Landlord has received notice of its name and address and a copy of its Leasehold Mortgage.

“Legal Costs” of any Person means all reasonable costs and expenses such Person incurs in any legal proceeding, including appeals (or other matter for which such Person is entitled to be reimbursed for its Legal Costs), including reasonable attorneys' fees, court costs, and expenses, and in or as a result of any Bankruptcy Proceeding.

“Loss” means a Casualty or Condemnation affecting the Premises.

“Loss Proceeds” means any Property Insurance Proceeds or Condemnation Award paid or payable for a Loss.

“**Management Meeting**” shall have the meaning set forth in Section 14.7.1 hereof.

“**Market Value**” of the Land or the Facility means, as of any date of determination, the present fair market value of such estate or improvement (including the fair market value of the rights of the holder of such estate in and to any improvements) as of such date, considering: a) as if no Loss had occurred; b) without adjusting for any expectation of any Loss; and (c) as if the Leasehold Estate had been terminated. Market Value shall be determined independently of, and without regard to, any valuation established in a Condemnation unless Tenant Notifies Landlord otherwise. Any such Notice shall not be effective without Leasehold Mortgagee’s consent.

“**Memorandum of Lease**” means a memorandum of this Lease, in recordable form, setting forth following provisions of this Lease: (a) all information any Law requires; b the Term of the Lease; (c) any grant of a power of attorney; and d) such other provisions, except the amount or means of determining Rent, as either party reasonably desires.

“**Modification**” or “**Modify**” means any abandonment, amendment, cancellation, discharge, extension, modification, rejection, renewal, replacement, restatement, substitution, supplement, surrender, termination, or waiver of a specified agreement or document, or of any of its terms or provisions, or the acceptance of any cancellation, rejection, surrender, or termination of such agreement, document, or terms.

“**Monetary Default**” means Tenant’s failure to pay any Rent or other money (including Real Estate Taxes and insurance premiums) when and as this Lease requires.

“**New Lease**” means a new lease of the Premises and related customary documents such as a memorandum of lease and a deed of Improvements. Any New Lease shall: (a) commence immediately after this Lease terminated; b continue for the entire remaining term of this Lease, as if no termination had occurred; (c) give New Tenant the same rights to Improvements that this Lease gave Tenant; (d) have the same terms, and the same priority, as this Lease, subject to any subsequent written amendments made with Leasehold Mortgagee’s consent; and (e) require New Tenant to cure, with reasonable diligence and continuity, within a reasonable time, all Defaults (except Tenant-Specific Defaults) not otherwise cured or waived.

“**New Tenant**” means Leasehold Mortgagee or its designee or nominee, and any of their successors and assigns.

“**Nonmonetary Default**” means Tenant’s: (a) failure to comply with any affirmative or negative covenant or obligation in this Lease, except a Monetary Default; or b breach of any representation or warranty (as of the date made or deemed made).

“**Notice**” or “**Notify**” means any consent, demand, designation, election, notice, or request relating to this Lease, including any Notice of Default. Notices shall be

delivered, and shall become effective, only in accordance with the “Notices” Article of this Lease.

“**Notice of Default**” means any Notice claiming or giving Notice of a Default or alleged Default.

“**Notice of Intent to Cure**” means any Notice claiming or giving Notice of a Leasehold Mortgagee’s intent to cure a Default under this Lease.

“**Permitted Exceptions**” means only: (a) the recorded title exceptions affecting the Fee Estate and prior to this Lease as of the Commencement Date, listed as exceptions in Tenant’s leasehold policy of title insurance for this Lease; (b) any title exceptions (including Subleases caused by Tenant’s acts or omissions, consented to or requested by Tenant, or resulting from Tenant’s Default; (c) any Application made at Tenant’s request; (d) this Lease and its terms and provisions; and (e) any state of facts an accurate survey would show.

“**Phase I Environmental Assessment**” means an environmental assessment and report prepared by a qualified environmental professional reasonably acceptable to Landlord that meets or exceeds the minimum requirements outlined in the then current version of the American Society of Testing and Materials Standard E 1527-00 (Standard Practice of Environmental Site Assessments: Phase I Environmental Site Assessment Process).

“**Phase II Environmental Assessment**” means an environmental assessment and report prepared by a qualified environmental professional reasonably acceptable to Landlord that goes beyond the investigations of a Phase I Environmental Assessment and involves sampling and testing of the Premises, including a) an asbestos survey conducted according to the standards of the Asbestos Hazard Emergency Response Act protocol; b) testing of any transformers on the Premises for PCBs; (c) testing for lead based paints; d) soil and groundwater sampling to measure the effect of any actual or suspected release or discharge of Hazardous Substances on the Premises; and e) such other sampling and testing reasonably necessary to determine the environmental condition of the Premises.

“**Permitted Use**” means the construction, maintenance and operation of the Facility, consistent with Good Engineering and Operating Practices.

“**PPA Disconnect**” means any period of time during which the Power Purchase Agreement remains in effect but because of a Tenant Event of Default under the Power Purchase Agreement MECO is not purchasing power from Tenant.

“**PPA Restoration**” means either a) the Power Purchase Agreement is reinstated following a termination of the Power Purchase Agreement; or b) Tenant’s Event of Default under the Power Purchase Agreement has been cured and MECO is purchasing

power from Tenant or its permitted successor assignee in accordance with the Power Purchase Agreement.

“Person” means any association, corporation, Government, individual, joint venture, joint-stock company, limited liability company, partnership, trust, unincorporated organization, or other entity of any kind. (This does not limit any Transfer restriction.)

“Prime Rate” means the “prime rate” of interest, as published from time to time by The Wall Street Journal in the “Money Rates” section of its Western Edition Newspaper (or the average prime rate if a high and a low prime rate are therein reported . The Prime Rate shall change without notice with each change in the prime rate reported by The Wall Street Journal, as of the date such change is reported. Any such rate is a general reference rate of interest, may not be related to any other rate, may not be the lowest or best rate actually charged by any lender to any customer or a favored rate and may not correspond with future increases or decreases in interest rates charged by lenders or market rates in general.

“Prohibited Lien” means any mechanic’s, vendor’s, laborer’s, or material supplier’s statutory lien or other similar lien arising from work, labor, services, equipment, or materials supplied, or claimed to have been supplied, to Tenant or anyone claiming through Tenant), but only if such lien attaches or may attach upon termination of this Lease) to the Fee Estate.

“Property Insurance Proceeds” means net proceeds (after reasonable costs of adjustment and collection, including Legal Costs of any property insurance policies covering the Premises, when and as received by Landlord, Tenant, Depository, or any Fee Mortgagee or Leasehold Mortgagee, excluding proceeds of Tenant’s business interruption insurance in excess of Rent.

“PSC” shall have the meaning set forth in Section 4.8 hereof.

“Real Estate Taxes” means all general and special real estate taxes (including sales taxes, use taxes, and the like , conveyance taxes, transfer taxes, assessments, municipal water and sewer rents, rates and charges, excises, levies, license and permit fees, fines, penalties and other governmental charges and any interest or costs with respect thereto, general and special, ordinary and extraordinary, foreseen and unforeseen, of any kind and nature whatsoever that at any time before or during the Term and applicable to the Term or any part of it may be assessed, levied, imposed upon, or become due and payable out of or in respect of, or charged with respect to or become a lien on, the Premises, or the sidewalks or streets in front of or adjoining the Premises, or any vault, passageway or space in, over or under such sidewalk or street, or any other appurtenances of the Premises, or other facility used in the operation thereof, or the rent or income received therefrom, or any use or occupancy thereof.

If at any time during the Term the method of taxation prevailing at the Commencement Date shall be altered so that any new tax, assessment, levy (including any municipal, state or federal levy), imposition, or charge, or any part thereof, shall be measured by or be based in whole or in part upon the Premises and imposed upon Landlord, then all such new taxes, assessments, levies, Real Estate Taxes, or charges, or the part thereof to the extent that they are so measured or based, shall be deemed to be included within the term “Real Estate Taxes,” to the extent that such Real Estate Taxes would be payable if the Premises were the only property of Landlord subject to such Real Estate Taxes.

“**Remaining Premises**” means any Premises that Landlord continues to own after a Total Loss.

“**Removal Period**” shall have the meaning set forth in Section 20.2 hereof.

“**Rent**” means Fixed Rent, Variable Rent and Additional Rent.

“**Requesting Party**” shall have the meaning set forth in Section 23.1 hereof.

“**Restoration**” and “**Restore**” means, after a Loss, the alteration, clearing, rebuilding, reconstruction, repair, replacement, restoration, and safeguarding of the damaged or remaining Improvements, substantially consistent with their condition before the Loss, subject to such Construction as Tenant shall perform in conformity with this Lease, subject to any changes in Law that would limit the foregoing.

“**Restoration Funds**” means any Loss Proceeds and deposits by Tenant) to be applied to Restoration.

“**Scheduled Expiration Date**” means the date upon which the Power Purchase Agreement terminates, i.e., the end of the Term as defined in the Power Purchase Agreement) *plus* any Extension Term defined in the Power Purchase Agreement).

“**Security Deposit**” means fifty percent (50%) of the Operating Period Security (as defined in the Power Purchase Agreement required under the Power Purchase Agreement.

“**State**” means the State of Hawaii.

“**Sublease**” means, for the Premises, any: (a) sublease; b agreement or arrangement including a concession, license, management, or occupancy agreement allowing any Person to occupy, use or possess; c subsublease or any further level of subletting; or (d) Modification or assignment of (a) through (c). (Any reference to Subleases does not diminish, impair, limit, or waive any limit on Subleases.)

“**Subrent**” means all money due and payable by Subtenants under Subleases.

“Substantial Casualty” means a Casualty that, pursuant to Law, prevents the Premises from being Restored for the Permitted Use.

“Substantial Condemnation” means any Condemnation that a takes the entire Premises; or b) in Tenant’s reasonable determination with Leasehold Mortgagee’s consent) renders the remaining Premises unsuitable for the Permitted Uses.

“Subtenant” means any Person entitled to occupy, use, or possess any Premises under a Sublease.

“Temporary Condemnation” means a Condemnation of the temporary right to use or occupy all or part of the Premises.

“Tenant-Specific Default” means any Nonmonetary Default that by its nature relates only to, or can reasonably be performed only by, Tenant or its Affiliates.

“Term” means the Initial Term, as it may be extended by any Extension Term.

“Total Loss” means any (a) Condemnation that affects all or substantially all the Premises; or (b) Loss after which Tenant cannot legally Restore the Facility for its Permitted Use.

“Transfer” of any property means any of the following, whether by operation of law or otherwise, whether voluntary or involuntary, and whether direct or indirect:

(a) any assignment, conveyance, grant, hypothecation, mortgage, pledge, sale, or other transfer, whether direct or indirect, of all or any part of such property, or of any legal, beneficial, or equitable interest or estate in such property or any part of it (including the grant of any easement, lien, or other encumbrance);

b any conversion, exchange, issuance, modification, reallocation, sale, or other transfer of any direct or indirect Equity Interest(s) in the owner of such property by the holders of such Equity Interest s ;

(c) any transaction described in b affecting any Equity Interest(s) or any other interest in such property or in any such owner (or in any other direct or indirect owner at any higher tier of ownership) through any manner or means whatsoever; or

(d) any transaction that is in substance equivalent to any of the foregoing.

A transaction affecting Equity Interests, as referred to in clauses (b) through (d), shall be deemed a Transfer by Tenant even though Tenant is not technically the transferor. However, a “Transfer” shall not include any of the foregoing (provided that the other party to this Lease has received Notice thereof) relating to any Equity Interest: (a) that constitutes a mere change in form of ownership with no material change in beneficial ownership and constitutes a tax-free transaction under federal income tax law

and the State real estate transfer tax; or b) to any Person that, as of the Commencement Date, holds an Equity Interest in the entity whose Equity Interest is being transferred.

“**Unavoidable Delay**” means delay in performing any obligation under this Lease (except payment of money) arising from or on account of any cause whatsoever beyond the obligor’s reasonable control, despite such obligor’s reasonable diligent efforts, including industry-wide strikes, labor troubles or other union activities but only to the extent such actions affect similar premises at that time and do not result from an act or omission of the obligor), the obligor’s inability to obtain required labor or materials after commercially reasonable efforts to do so, litigation unless caused by the obligor), Loss, accidents, Laws, governmental preemption, war, or riots. Unavoidable Delay shall exclude delay caused by the obligor’s financial condition, illiquidity, or insolvency. Any obligor claiming Unavoidable Delay shall Notify the obligee: a) within 30 days after such obligor knows of any such Unavoidable Delay; and b) within 10 days after such Unavoidable Delay ceases to exist. To be effective, any such Notice must describe the Unavoidable Delay in reasonable detail. Where this Lease states that performance of any obligation is subject to Unavoidable Delay(s) or words of similar import, such Unavoidable Delay s shall extend the time for such performance only by the number of days by which such Unavoidable Delay(s) actually delayed such performance.

“**Underground Storage Tank**” means any combination of tanks including pipes connected to the tanks) used to contain an accumulation of Hazardous Substances, and the volume of which including the volume of the underground pipes connected to the tanks) is ten percent or more beneath the surface of the ground.

1.3 **Principles of Interpretation.** A term defined in the singular may be used in the plural, and vice versa, all in accordance with ordinary principles of English grammar, which also govern all other language in this Lease. The words “include” and “including” shall be construed to be followed by the words: “without limitation.” Each of these terms shall be interpreted as if followed by the words “(or any part of it)” except where the context clearly requires otherwise: Fee Estate; Improvements; Land; Leasehold Estate; Premises; and any other similar collective noun. Every reference to any document, including this Lease, refers to such document as Modified from time to time (except, at Landlord’s option, any Modification that violates this Lease , and includes all exhibits, schedules, and riders to such document. The word “or” includes the word “and.”

1.4 **Conflict between Lease and Power Purchase Agreement.** To the extent there exists any conflict between the provisions of this Lease and the Power Purchase Agreement, the Power Purchase Agreement shall control.

2. TERM

2.1 **Initial Term.** The initial term of this Lease (the “**Initial Term**”) shall: (a) commence on the Commencement Date; and b) end on the Scheduled Expiration Date, unless terminated sooner. If the Commencement Date is not the first (or the

Expiration Date is not the last) day of a Lease Year, then from the Commencement Date through the day before the first Lease Year or from the day after the last Lease Year through the Expiration Date, the parties shall have all the same rights and obligations under this Lease (including regarding Rent) that they do during the first (or the last, as applicable) full Lease Year, all prorated daily.

2.2 **Automatic Termination.** Notwithstanding anything to the contrary in this Lease, this Lease shall automatically terminate upon termination of the Power Purchase Agreement, without Notice.

3. RENT

3.1 **Fixed Rent.** Tenant shall pay Landlord, without notice or demand, in lawful money of the United States of America, a fixed annual rental (the “**Fixed Rent**”) as follows:

3.1.1 \$200.00 per acre per month, upon execution of the Lease and increased to 50%, \$300.00 per acre per month, as long as the Power Purchase Agreement remains in effect upon commercial operations and adjusted annually by the CPI Adjustment Factor; or

3.1.2 10% of the Land Value per year, adjusted annually by the CPI Adjustment Factor, commencing on the date a PPA Disconnect occurs and continuing for the period a PPA Disconnect remains in effect.

If there is no longer a PPA Disconnect, and a PPA Restoration occurs, the Fixed Rent shall be restored to the rate that was effective at time of PPA Disconnect until any new PPA Disconnect occurs.

3.2 **Annual or Monthly Payment; Proration; Etc.** Tenant shall pay Fixed Rent annually in advance, otherwise Tenant shall pay Fixed Rent in equal monthly installments in advance on the first day of each month. Tenant shall pay all Rent payable to Landlord by good and sufficient check payable to Landlord or by wire transfer, at such address as Landlord shall designate from time to time.

3.3 **Variable Rent.** Tenant shall pay Landlord, without notice or demand, in lawful money of the United States of America, a variable monthly rent (the “**Variable Rent**”) as follows:

3.3.1 2.00% of the monthly gross receipts received from HECO to the Tenant per the negotiated PPA for the project.

3.4 **Additional Rent.** In addition to Fixed Rent and Variable Rent, Tenant shall pay Landlord (or the appropriate third party, as applicable), as additional rent under this Lease, all Additional Rent. Except where this Lease provides otherwise, Tenant shall

pay all Additional Rent within 15 days after receipt of an invoice and reasonable backup documentation.

3.5 **No Offsets.** Tenant shall pay all Rent without offset, defense, claim, counterclaim, reduction, or deduction of any kind whatsoever.

4. **ADDITIONAL PAYMENTS BY TENANT; REAL ESTATE TAXES**

4.1 **Landlord's Net Return.** This Lease shall constitute an absolutely "net" lease. The Fixed Rent shall give Landlord an absolutely "net" return for the Term, free of any expenses or charges for the Premises, except as this Lease expressly provides. Tenant shall pay as Additional Rent and discharge (subject to Tenant's right of Contest as this Lease expressly provides), before failure to pay creates a material risk of forfeiture or penalty, each and every item of expense, of every kind and nature whatsoever, related to or arising from the Premises, or by reason of or in any manner connected with or arising from the leasing, operation, management, maintenance, repair, use, or occupancy of, or Construction affecting the Premises.

4.2 **No Tenant Obligation.** Notwithstanding anything to the contrary in this Lease, Tenant need not pay the following items payable, accrued, or incurred by Landlord: (a) Fee Debt Service; (b) depreciation, amortization, brokerage commissions, financing or refinancing costs, management fees, or leasing expenses for the Fee Estate or the Premises; and (c) any costs or expenses that Landlord incurs in or for any Management Meeting, except to the extent that this Lease requires Tenant to pay such costs or expenses.

4.3 **Real Estate Taxes.** Tenant shall pay and discharge all Real Estate Taxes payable or accruing for all period(s) within the Term, before failure to pay creates a material risk to Landlord of forfeiture or penalty, subject however to Tenant's right of Contest as this Lease expressly provides. Tenant shall also pay all interest and penalties any Government assesses for late payment of any Real Estate Taxes, except late payment because Landlord failed to remit any payment for Real Estate Taxes (paid to Landlord by Tenant) in accordance with Tenant's reasonable instructions (provided they involve only ministerial functions) or failed to forward promptly Tenant a copy of any applicable bill that Landlord receives. In the latter case Landlord shall pay such interest and penalties. Tenant shall within a reasonable time after Notice from Landlord give Landlord reasonable proof that Tenant has paid any Real Estate Taxes that this Lease requires Tenant to pay. Tenant shall have the sole right and authority to contest Real Estate Taxes, in compliance with the Contest Conditions.

4.4 **Assessments in Installments.** To the extent Law allows, Tenant may apply to have any assessment payable in installments. Upon approval of such application, Tenant shall pay and discharge only such installments as become due and payable during the Term.

4.5 **Utilities.** Tenant shall arrange and pay for all fuel, gas, light, power, water, sewage, garbage disposal, telephone, and other utility charges, and the expenses of installation, maintenance, use, and service in connection with the foregoing, for the Premises during the Term. Landlord shall have absolutely no liability or responsibility for the foregoing.

4.6 **Security Deposit.** Concurrently with Tenant's execution of this Lease, Tenant shall deposit with Landlord the Security Deposit. Landlord shall hold the Security Deposit as security for the performance of Tenant's obligations under this Lease. If Tenant Defaults on any provision of this Lease, Landlord may, without prejudice to any other remedy it has, apply all or part of the Security Deposit to any Rent or other sum in default, any amount that Landlord may spend or become obligated to spend in exercising Landlord's rights under this Lease, or any expense, loss, or damage that Landlord may suffer because of Tenant's Default.

4.7 **Tax.** Tenant will pay to Landlord at the time and together with each payment of Rent that is subject to tax, including GET or PSC, whichever is applicable, and any other applicable tax on account of the receipt, actual or constructive, by Landlord of the rental payments, reimbursement of gross income taxes, and any other taxable gross income attributable to the Premises or this Lease, an amount which, when added to Rent (whether actually or constructively received by Landlord, shall yield to Landlord, after deduction of the tax, an amount equal to that which Landlord would have realized had no such tax been imposed. For the purposes of this Section, "**GET**" means the State of Hawaii general excise tax on gross income under Hawaii Revised Statutes Chapter 237, and any sales or value added taxes under any successor, similar or new federal, state or county law that may be hereafter enacted, and "**PSC**" means the State of Hawaii public service company tax under Hawaii Revised Statutes Chapter 239. For purpose of illustration only, the amount necessary to reimburse Landlord is as of the Commencement Date 4.1666%.

4.8 **Conveyance Tax.** Tenant shall pay the conveyance tax imposed under Hawaii Revised Statutes Chapter 247 that is due and payable upon the Commencement Date. Tenant shall provide Landlord with proof satisfactory to Landlord that the conveyance tax has been paid.

5. USE

5.1 **Permitted Use.** Tenant shall use the Premises for the Permitted Use and only for the Permitted Use. Tenant shall continuously use and operate the Premises for the Permitted Use.

5.2 **Permitted Use Unique.** Landlord has leased the Premises to Tenant solely for the purpose of Tenant's providing electrical power to MECO's system pursuant to the Power Purchase Agreement. The State Public Utilities Commission has authorized Landlord to enter into this Lease only in connection with and for the purposes of the Power Purchase Agreement. Tenant acknowledges and agrees that the Premises cannot

be used for any purpose other than the Permitted Use. Tenant waives and relinquishes any right it may have under Bankruptcy Law, in any Bankruptcy Proceeding, or otherwise to assert the Premises should be used for a purpose other than the Permitted Use.

5.3 **Access.** All access roads made available or maintained by the Landlord, providing access from the Premises to public roads shall at all times be subject to the exclusive control and management of Landlord, and Landlord shall have the right, from time to time, to establish, modify and enforce reasonable rules and regulations with respect to the access and Tenant agrees to comply with all of Landlord's rules and regulations with respect to the access.

5.4 **Exclusive Control.** Tenant shall have exclusive control, possession, occupancy, use, and management of the Premises, subject only to Permitted Exceptions.

5.5 **Operational Costs.** Tenant shall timely pay and discharge all fees, costs, and expenses related to or arising from the management or operation of the Premises and the provision of services to the Premises.

6. SECURITY OF PREMISES

6.1 **Secured Facility.** Tenant shall secure the Facility and prevent access to the Facility by unauthorized personnel in the same manner or higher as MECO secures its power generating facilities in the County. Notwithstanding MECO's then current security procedures for its own facilities, Landlord may require Tenant to maintain personnel on the Premises 24 hours a day 7 days a week to monitor the security and safety of the Premises and Facility.

6.2 **Limited Access to Premises.** Tenant will maintain barriers on the Premises to prevent unauthorized persons or vehicles from entering or crossing through the Premises and adjacent lands owned or operated by Landlord.

6.3 **Personnel.** Tenant shall conduct security and background checks on all Tenant employees, independent contractors, and other persons who are regularly allowed access to the Facility and shall require all such persons to take periodic drug tests. Tenant shall not allow on the Premises any persons who do not pass such security checks or drug tests.

7. COMPLIANCE

7.1 **Generally.** Tenant shall during the Term, at Tenant's expense, in all material respects, subject to Tenant's right of Contest: (a) comply with all Laws and Permitted Exceptions; b) comply with the Land Use Conditions, if any; (c) procure all Approvals required by Law other than the approval of the Power Purchase Agreement by the State Public Utilities Commission; and (d) comply with all Approvals.

7.2 **Power Purchase Agreement.** Tenant shall during the Term, at Tenant's expense, in all material respects, comply with Tenant's obligations under the Power Purchase Agreement.

7.3 **Notice of Inspections.** Tenant shall give Landlord Notice of any proposed inspection of the Premises or the Facility by any Government agency immediately upon Tenant's receipt of notice of such inspection.

7.4 **Copies of Notices.** Landlord shall promptly give Tenant a copy of any notice of any kind regarding the Premises or any Real Estate Taxes (including any bill or statement), and any notice of nonrenewal or threatened nonrenewal of any Approval that Landlord receives from any Government, utility company, insurance carrier, or insurance rating bureau.

8. MAINTENANCE AND CONSTRUCTION

8.1 **Obligation to Maintain.** Except to the extent that (a) this Lease otherwise expressly provides or allows or (b) Tenant is performing Construction in compliance with this Lease, Tenant shall during the Term keep and maintain the Premises in good order, condition, and repair, subject to Loss (governed by other provisions of this Lease), reasonable wear and tear, and any other condition that this Lease does not require Tenant to repair. Tenant's obligation to maintain the Premises includes an obligation to make all repairs that the Premises (including plumbing, heating, air conditioning, ventilating, electrical, lighting, fixtures, walls, building systems, ceilings, floors, windows, doors, plate glass, skylights, landscaping, drainage, retention basins, bridges, driveways, site improvements, curb cuts, parking lots, fences and signs located in, on or at the Premises, together with any sidewalks and streets adjacent to the Premises) may require by Law from time to time during the Term, whether structural or nonstructural, foreseen or unforeseen, capital or operating. Tenant shall remove trash and debris from the Premises and the adjoining sidewalk, and maintain them in a reasonably clean condition.

8.2 **Acceptance of Premises.** Tenant acknowledges that it has, or has had the opportunity, to inspect carefully the Premises, and accepts the Premises in **AS IS** condition **WITH ALL FAULTS**. Tenant further acknowledges that neither Landlord nor its agents or employees have made any representations or warranties of any kind whatsoever as to the suitability or fitness of the Premises for the conduct of Tenant's business or for any other purpose, nor has Landlord or its agents or employees agreed to make any repairs, undertake any alterations, or construct any improvements to the Premises or with respect to the Premises.

8.3 **Construction.** At Tenant's sole cost and expense, Tenant shall construct the Facility in accordance with the requirements of the Power Purchase Agreement. Tenant shall not commence Construction until it has the applicable necessary Approvals. Prior to commencement of any Construction, Tenant shall cause each entity involved in such Construction, who is a direct contractor of Tenant and who has mechanic lien rights under Chapter 507 of the Hawaii Revised Statutes, to deliver to Landlord a performance

and payment bond in a form acceptable to Landlord and from a surety reasonably acceptable to Landlord, covering the faithful performance of such entity's contract with the Tenant and the payment of all obligations arising thereunder, and naming Landlord as an obligee. Tenant shall complete Construction of the Facility within the time periods required by the Power Purchase Agreement. Tenant shall pay for all Construction when and as required by the parties that perform such Construction. All Improvements that Tenant constructs on the Land shall become part of the Premises.

8.4 Plans and Specifications. To the extent that Tenant obtains plans and specifications or surveys (including working plans and specifications and "as-built" plans and specifications and surveys for any Construction, Tenant shall promptly upon Landlord's request give Landlord a copy, subject to the terms of any agreement between Tenant and the applicable architect, engineer, or surveyor. Tenant shall exercise reasonable efforts to cause its agreements with such professionals to permit these deliveries, which are for Landlord's information only except to the extent, if any, this Lease otherwise expressly states.

8.5 Applications. Upon Tenant's request, Landlord shall, without cost to Landlord, promptly join in and execute any Application as Tenant reasonably requests, provided that: (a) such Application is in customary form and imposes no material obligations (beyond obligations ministerial in nature or merely requiring compliance with Law upon Landlord; b no uncured Event of Default exists; and (c) Tenant reimburses Landlord's Legal Costs. Promptly upon Tenant's request and without charge except reimbursement of Landlord's Legal Costs), Landlord shall furnish all information in its possession that Tenant reasonably requests for any Application.

9. PROHIBITED LIENS

9.1 Tenant's Covenant. If a Prohibited Lien is filed, Tenant shall, within 30 days after receiving Notice from Landlord of such filing (but in any case within 15 days after Landlord Notifies Tenant of commencement of any application for a mechanic's lien or foreclosure proceedings , commence appropriate action to cause such Prohibited Lien to be paid, discharged, bonded, or cleared from title. Tenant shall thereafter prosecute such action with reasonable diligence and continuity. If Landlord receives notice of any such filing, then Landlord shall promptly Notify Tenant. Nothing in this Lease shall be construed to: (a) limit Tenant's right of Contest; or b obligate Tenant regarding any lien that results from any act or omission by Landlord.

9.2 Protection of Landlord. Notice is hereby given that Landlord shall not be liable for any labor or materials furnished or to be furnished to Tenant upon credit, and that no mechanic's or other lien for any such labor or materials shall attach to or affect the Fee Estate. Nothing in this Lease shall be deemed or construed in any way to constitute Landlord's consent or request, express or implied, by inference or otherwise, to any contractor, subcontractor, laborer, equipment or material supplier for the performance of any labor or the furnishing of any materials or equipment for any

construction, nor as giving Tenant any right, power or authority to contract for, or permit the rendering of, any services, or the furnishing of any materials that would give rise to the filing of any liens against the Fee Estate. Tenant shall Indemnify Landlord against any claims arising out of Construction undertaken by Tenant or anyone claiming through Tenant, and against all Prohibited Liens.

10. HAZARDOUS SUBSTANCES

10.1 Baseline Assessment. Tenant has obtained a Baseline Assessment and has provided Landlord with a copy of the results of the Baseline Assessment. Any Hazardous Substances not disclosed in the Baseline Assessment and subsequently discovered on the Premises shall be presumed to be present as a result of Tenant's use and occupancy of the Premises during the Term, unless Tenant shall prove, by clear and convincing proof, that the Hazardous Substances: a) were present on the Premises prior to the Term; b) migrated onto the Premises as the result of the activities of a third party; or (c) are present on the Premises as the result of Landlord's improper actions.

10.2 Compliance with Environmental Law. Tenant shall keep and maintain the Premises, including the Land, the air above the Land, the surface and run-off water on the Land, and the groundwater under the Land, in compliance with, and shall not cause or permit the Premises or any portion of the Premises to be in violation of, any Environmental Law.

10.3 Use of Hazardous Substances. Tenant shall not cause or allow any Hazardous Substances Discharge, except (a) in the ordinary course of Tenant's business b) in accordance with the instructions of the manufacturer and for the purpose described in such instructions, and (c) in strict compliance with all applicable Environmental Law. Tenant shall not install any Underground Storage Tank on, within, under or about the Premises without first obtaining Landlord's written approval. Tenant shall not accept hazardous waste (as defined under any Environmental Law) generated off the Premises for any purpose, including treatment, storage or disposal.

10.4 List of Hazardous Substances. On the Commencement Date and on each anniversary of the Commencement Date, and at any other time Landlord requests, Tenant shall provide Landlord with a written list identifying any Hazardous Substances then used, stored, or maintained upon the Premises, the use and approximate quantity of each such material, a copy of any material safety data sheet MSDS issued by the manufacturer thereof, written information concerning the removal, transportation, and disposal of the same, and such other information as Landlord may reasonably require or as may be required by Law.

10.5 Notice of Disturbance of Any Hazardous Substances. Tenant shall provide Landlord 30 days' prior Notice before commencing any activities, including repair or remodeling of the Facility or the Premises or installation or removal of any personal property from the Premises, which could result in the disturbance of any Hazardous Substances. Together with such Notice, Tenant shall advise Landlord of

protective measures to be taken by Tenant to ensure that Hazardous Substances shall not be released and to ensure compliance with Environmental Law. Tenant shall comply with all reasonable conditions (including adequate assurance of financial resources to comply with Environmental Law) that may be imposed by Landlord in connection with Tenant's proposed activities.

10.6 Hazardous Substances Claims. Tenant shall immediately Notify Landlord of: (a) any Hazardous Substances Claims; or (b) Tenant's discovery of any occurrence or condition of the Premises which could subject Tenant or Landlord to any liability, or restrictions on ownership, occupancy, transferability or use of the Premises under any Environmental Law.

10.7 Remediation and Removal. Except for the use of Hazardous Substances permitted by this Lease, Tenant shall cause any Hazardous Substances Discharge to be: (a) remediated on-site in accordance with applicable Environmental Law; or b removed from the Premises for remediation or disposal and to be transported solely by duly licensed Hazardous Substances transporters to duly licensed disposal facilities for final disposition to the extent required by and in accordance with applicable Environmental Law. Tenant shall deliver to Landlord copies of any hazardous waste manifest reflecting the proper disposition of such Hazardous Substances. Except in emergencies or as otherwise required by law, Tenant shall not take any remedial or removal action in response to a Hazardous Substances Discharge without first Notifying Landlord.

10.8 Proceedings on Hazardous Substances Claims; Indemnity. Tenant shall not enter into any legal proceeding or other action, settlement, consent decree or other compromise with respect to any Hazardous Substances Claims without first Notifying Landlord of Tenant's intention to do so and affording Landlord the opportunity to join and participate as a party if Landlord so elects in such proceedings. Tenant shall be solely responsible for and shall Indemnify the Indemnitee against any Hazardous Substances Claims, including: a the costs of any required or necessary removal, repair, cleanup or remediation of the Premises, and the preparation and implementation of any closure, removal, remedial or other required plans; and (b) all reasonable costs and expenses incurred by Landlord in connection therewith, including Legal Costs.

10.9 Assurance of Performance.

10.9.1 Landlord's Phase II Environmental Assessment. Landlord may, but shall not be required to, engage such contractors as Landlord determines to be appropriate to perform from time to time a Phase II Environmental Assessment, including environmental sampling and testing, of: (i) the Premises, the surrounding soil and any adjacent areas, and any ground water located under or surface water located adjacent to the Premises or any adjoining property; ii) Tenant's compliance with all Environmental Law and the provisions of this Lease; and (iii) the provisions made by Tenant for carrying out any removal or remedial action that may be required by reason of the nature of Tenant's business and operations on the Premises.

10.9.2 Cost of Assessment. All costs and expenses incurred by Landlord in connection with any such Phase II Environmental Assessment shall be paid by Landlord, except that if any such Phase II Environmental Assessment shows that: (i) the environmental condition of the Premises has materially declined in comparison to the Baseline Assessment; (ii) Tenant has failed to comply with the provisions of this Lease with respect to Hazardous Substances; (iii) the Premises (including surrounding soil and any underlying groundwater or adjacent surface water) has become contaminated due to operations or activities not attributable to Landlord; or iv an event that is the basis for a Hazardous Substances Claim occurred during the Term, then all of the costs and expenses of such assessment shall be paid by Tenant.

10.9.3 Conducting Assessment. Each Phase II Environmental Assessment shall be conducted: (a) only after advance Notice of such assessment has been provided to Tenant at least 10 days' prior to the date of the assessment; and b) in a manner reasonably designed to minimize the interruption of Tenant's operations and use of the Premises. Landlord shall repair any substantial damage to the Premises or to Tenant's property that is directly caused by the Phase II Environmental Assessment.

10.10 Tenant's Obligations Prior to and Upon Surrender.

10.10.1 Tenant's Phase I and Phase II Environmental Assessment Deposit. No later than 18 months prior to the Scheduled Expiration Date, Tenant shall deposit with Landlord a sum equal to the then current estimated cost of conducting a Phase I and Phase II Environmental Assessment of the Premises. Landlord shall hold such sum for Tenant and shall apply or reimburse such sum as provided in this section.

10.10.2 Tenant's Phase I (or Phase II) Environmental Assessment.

(a) No later than the beginning of the last year of the Term, or immediately upon earlier termination of the Term, Tenant, at Tenant's sole cost and expense shall cause a Phase I Environmental Assessment of the Premises to be conducted, or provide Landlord with a report based upon a Phase I Environmental Assessment conducted no earlier than 3 months prior to the beginning of the last year of the Term. In addition, no later than the end of the Term, Tenant shall (A) cause all Hazardous Substances previously owned, stored or used by Tenant to be removed from the Premises and disposed of in accordance with all Environmental Law; and B) remove any Underground Storage Tanks or other containers installed or used by Tenant to store any Hazardous Substances on the Premises, and repair any damage to the Premises caused by such removal.

b) Upon termination of this Lease and Tenant's satisfactory compliance with all of the requirements of this section, Landlord shall return to Tenant, without interest, the amount deposited in accordance with this section. In the event that Tenant does not cause a Phase I Environmental Assessment to be conducted or does not provide Landlord with a timely report based upon an assessment conducted no earlier than 3 months prior to the beginning of the last year of the Term, Landlord may (but shall

not be required to cause a Phase I Environmental Assessment to be conducted and may apply the sums previously deposited by Tenant to pay for such assessment. If the assessment costs more than the amount of the deposit, Tenant shall pay to Landlord, upon demand, the difference. If the assessment costs less than the amount of the deposit, Landlord shall, no later than 30 days after payment in full of such costs, return to Tenant a sum equal to the amount by which the deposit exceeds the actual costs of such assessment.

(c) If either Tenant's or Landlord's Phase I Environmental Assessment identifies areas of concern that in Landlord's reasonable judgment indicate that further investigation is required, Tenant, at Tenant's sole cost and expense, shall cause a Phase II Environmental Assessment of the Premises to be conducted. If Tenant does not cause such Phase II Environmental Assessment to be conducted, Landlord may (but shall not be required to) cause a Phase II Environmental Assessment to be conducted and may apply the sums previously deposited by Tenant to pay for such assessment. If the assessment costs more than the amount of the deposit, Tenant shall pay to Landlord, upon demand, the difference. If the assessment costs less than the amount of the deposit, Landlord shall, no later than 30 days after payment in full of such costs, return to Tenant a sum equal to the amount by which the deposit exceeds the actual costs of such assessment. Tenant hereby expressly acknowledges and agrees that Tenant's covenant and obligation to pay all costs and expenses associated with any Phase II Environmental Assessment required under this section, whether commissioned by Tenant or Landlord, shall survive termination of this Lease.

10.11 **Clean-up.**

10.11.1 **Environmental Report.** If any written report containing results of any Phase I Environmental Assessment ("**Environmental Report**") shall: (i) reveal that the environmental condition of the Premises has materially declined in comparison to the Baseline Assessment; or (ii) Tenant has materially violated any warranty, representation, or covenant of this section; or (iii) recommend the repair, closure, remediation, removal or other clean-up collectively, the "**Clean-up**") of any Hazardous Substances found on or about the Premises, and if Landlord determines that Tenant is responsible for such Clean-up, then:

(a) Landlord shall provide Tenant with a copy of such Environmental Report and with a written explanation of the reasons why Landlord believes that Tenant is responsible, under the principles of this section for conducting the Clean-up identified in such Environmental Report.

b) If, within 30 days after receiving a copy of such Environmental Report and such written statement, Tenant fails either (i) to complete the Clean-up, or (ii) with respect to any Clean-up which cannot be completed within such 30-day period, fails to proceed with reasonable diligence to complete such Clean-up as promptly as practicable, then Landlord shall have the right, but not the obligation, to

carry out any Clean-up recommended by the Environmental Report or required by any Government, and to recover all of the costs and expenses of such Clean-up from Tenant as Additional Rent together with Default Interest from the date Landlord incurred such costs and expenses until paid in full.

10.11.2 **Emergency.** If the Environmental Report reveals a situation which, in Landlord's sole discretion, constitutes an emergency, then Landlord shall have the right, but not the obligation, to carry out any Clean-up recommended by the Environmental Report or required by any Government, and to recover all of the costs and expenses of such Clean-up from Tenant as Additional Rent together with interest at the Default Interest from the date Landlord incurred such costs and expenses until paid in full.

10.11.3 **Submission of Report to Government.** To the extent required by Law, Landlord shall be entitled to submit the Environmental Report to any Government.

10.11.4 **Completion of Clean-up Before Surrender or Termination.** Tenant shall complete Clean-up prior to surrender of the Premises and termination of this Lease, and shall fully comply with all Environmental Law and requirements of any Government over the Clean-up, including any requirement to file such assessment, mitigation plan, risk assessment or other information with any such Government prior to such surrender or termination.

10.11.5 **Tenant's Inability to Complete.** Should any such Clean-up for which Tenant is responsible not be completed or should Tenant not receive any Government approvals regarding the Premises or areas adjacent to the Premises required under Environmental Law prior to the expiration or sooner termination of this Lease, including any extensions of this Lease, then i Tenant shall deposit with Landlord an amount of money equal to the balance of the estimated costs of the Clean-up; and (ii) if the nature of the Clean-up makes the Premises untenable or unleaseable until the Clean-up is completed, then Tenant shall be liable to Landlord as a holdover tenant, subject to the terms and conditions set forth in this Lease, until the Clean-up has been sufficiently completed to make the Premises suitable for lease to third parties.

10.12 Confidentiality.

10.12.1 **Keeping Information Confidential.** Except if required to do so by Law, or compelled by subpoena or discovery proceedings in any legal action or governmental proceeding, Tenant agrees that Tenant shall not disclose, discuss, disseminate or copy any information, data, findings, communications, conclusions and reports regarding the environmental condition of the Premises, to any Person, including any Government, without the prior written consent of Landlord. Upon completion of any Clean-up of the Premises, Tenant shall deliver and return to Landlord, all information, data, findings, communications, conclusions and reports regarding the environmental condition of the Premises whether provided to Tenant by Landlord or not.

10.12.2 **Scope of Obligation.** Tenant's obligation to maintain the confidentiality of all information, data, findings, communications, conclusions and reports regarding the environmental condition of the Premises, include but are not limited to Tenant's officers, employees, agents, attorneys, environmental consultants and contractors. Tenant's obligation to maintain the confidentiality of all information, data, findings, communications, conclusions and reports regarding the environmental condition of the Premises, shall survive the termination of this Lease.

10.13 **Copies of Environmental Reports.** Tenant shall provide Landlord with a copy of any and all environmental assessments, audits, studies and reports regarding Tenant's past or current activities on the Premises or the environmental condition of the Premises within 30 days of Tenant's receipt of such materials. Tenant shall be obligated to provide Landlord with a copy of such materials without regard to whether they are generated by Tenant or prepared for Tenant, or how Tenant comes into possession of such materials.

10.14 **Survival of Agreements.** The covenants of this section, including the indemnification provision, shall survive the expiration or termination of this Lease, or any termination of Tenant's interest in the Premises.

11. INDEMNIFICATION; LIABILITY OF LANDLORD

11.1 **Obligations.** Tenant shall Indemnify Landlord against any: (a) wrongful act, wrongful omission, or negligence of Tenant (and anyone claiming by or through the Tenant or its partners, members, directors, officers, or employees; b) breach or default by Tenant under this Lease; or (c) breach of any representation or warranty Tenant makes in this Lease. Tenant shall also Indemnify Landlord against the following during the Term and so long as Tenant remains in possession after the Expiration Date: (u) any Contest Tenant initiates; (v) any Application made at Tenant's request; (w) use, occupancy, control, management, operation, and possession of the Premises; x any Construction and any agreements that Tenant or anyone claiming through Tenant) makes for any Construction; (y) the condition of the Premises or any street, curb or sidewalk adjoining the Premises, or of any roadways or easements adjoining or appurtenant to the Premises; and (z) any accident, injury or damage whatsoever caused to any person in or on the Premises or upon or under roadways or easements adjoining or appurtenant to the Premises. Tenant shall be required to Indemnify Landlord Group notwithstanding the acts or omissions or negligence of Landlord, but Tenant shall not be required to Indemnify Landlord regarding Landlord's intentional acts or gross negligence. This paragraph does not apply to Environmental Law and Hazardous Substances Discharges, which are covered in Section 10.8.

11.2 **No Liability of Landlord.** During the Term: (a) Tenant is and shall be in exclusive control and possession of the Premises; and b Landlord shall not be liable for any injury or damage to any property of Tenant or any other Person) or to any person occurring on or about the Premises, except to the extent caused by Landlord's intentional

act or gross negligence. Landlord's right to enter and inspect the Premises is intended solely to allow Landlord to ascertain whether Tenant is complying with this Lease and the Power Purchase Agreement and (to the extent this Lease allows) to cure any Default. Such provisions shall not impose upon Landlord any liability to third parties. Nothing in this Lease shall be construed to exculpate, relieve, or Indemnify Landlord from or against any liability of Landlord: (y) to third parties existing at or before the Commencement Date; or (z) arising from Landlord's intentional acts or omissions or gross negligence.

11.3 Indemnification Procedures. Wherever this Lease requires any Indemnitor to Indemnify any Indemnitee, including, without limitation, under Sections 9.2, 10.8, 11.1, 17.5, 18.2, and 26.7 of this Lease:

11.3.1 Prompt Notice. Indemnitee shall promptly Notify Indemnitor of any claim. To the extent, and only to the extent, that Indemnitee fails to give prompt Notice and such failure materially prejudices Indemnitor, Indemnitor shall be relieved of its indemnity obligations for such claim.

11.3.2 Selection of Counsel. Indemnitor shall select counsel reasonably acceptable to Indemnitee. Even though Indemnitor shall defend the action, Indemnitee may, at its option and its own expense, engage separate counsel to advise it regarding the claim and its defense. Such counsel may attend all proceedings and meetings. Indemnitor's counsel shall actively consult with Indemnitee's counsel. Indemnitor and its counsel shall, however, fully control the defense.

11.3.3 Cooperation. Indemnitee shall reasonably cooperate with Indemnitor's defense, provided Indemnitor reimburses Indemnitee's actual reasonable out of pocket expenses including Legal Costs of such cooperation.

11.3.4 Settlement. Indemnitor may, with Indemnitee's consent, not to be unreasonably withheld, settle the claim. Indemnitee's consent shall not be required for any settlement by which: w Indemnitor procures (by payment, settlement, or otherwise a release of Indemnitee by which Indemnitee need not make any payment to the claimant; (x) neither Indemnitee nor Indemnitor on behalf of Indemnitee admits liability; (y) the continued effectiveness of this Lease is not jeopardized in any way; and z Indemnitee's interest in the Premises is not jeopardized in any way.

11.3.5 Insurance Proceeds. Indemnitor's obligations shall be reduced by net insurance proceeds Indemnitee actually receives for the matter giving rise to indemnification.

12. RIGHT OF CONTEST

12.1 Tenant's Right; Contest Conditions. Notwithstanding anything to the contrary in this Lease, Tenant shall have the right to contest, at its sole cost, by appropriate legal proceedings diligently conducted in good faith, the amount or validity of any Real Estate Taxes or Prohibited Lien; the valuation, assessment, or reassessment

whether proposed, phased, or final) of the Premises for Real Estate Taxes; the amount of any Real Estate Tax; the validity of any Law or its application to the Premises; the terms or conditions of, or requirements for, any Approval; or the validity or merit of any claim against which this Lease requires Tenant to Indemnify Landlord (any of the foregoing, a “**Contest**”). Tenant may defer payment or performance of the contested obligation pending outcome of the Contest, provided that Tenant causes the following conditions (collectively, the “**Contest Conditions**”) to remain satisfied:

12.1.1 **No Fines.** Such deferral or noncompliance shall not subject Landlord to a material risk of any fine or penalty, except civil penalties for which Tenant has given Landlord a bond, letter of credit, or other security reasonably satisfactory to Landlord (the “**Contest Security**”) in an amount equal to the reasonably estimated amount of such civil penalties.

12.1.2 **No Liability.** Such deferral or noncompliance creates no material risk of a lien, charge, or other liability of any kind against the Fee Estate, unless Tenant has given Landlord Contest Security equal to the reasonably estimated amount of such lien, charge, or other liability.

12.1.3 **No Forfeiture.** Such deferral or noncompliance will not place the Fee Estate in material danger of being forfeited or lost.

12.1.4 **No Cost to Landlord.** Such Contest shall be without cost, liability, or expense to Landlord.

12.1.5 **Diligence.** Tenant shall prosecute such Contest with reasonable diligence and in good faith.

12.1.6 **Payment.** If required for such Contest, Tenant shall have paid the Contested Real Estate Taxes or other matter.

12.1.7 **Collection of Real Estate Taxes.** If such Contest relates to any Real Estate Tax, then such Contest shall suspend its collection from Landlord and the Fee Estate.

12.1.8 **No Tax Deed.** If, at any time, payment of any Real Estate Taxes is necessary to prevent the imminent (i.e., within 30 days) delivery of a tax deed of the Fee Estate for nonpayment, then Tenant shall pay or cause to be paid the sums in sufficient time to prevent delivery of such deed.

12.1.9 **No Event of Default.** No Uncured Event of Default shall exist under this Lease during the pendency of such Contest.

12.1.10 **Security.** If the amount at issue in such Contest (and all other Contests then pending) exceeds an amount equal to \$100,000.00, then Tenant shall,

before proceeding with such Contest, give Landlord Contest Security equal to such excess (less any Contest Security otherwise provided for the same Contest .

12.1.11 **Named Parties.** If Landlord has been named as a party in any action, then Tenant shall cause Landlord to be removed as such party and Tenant substituted in Landlord's place, if permissible under the circumstances.

12.2 **Landlord Obligations and Protections.** Landlord need not join in any Contest unless a) Tenant has complied with the Contest Conditions; and b) such Contest must be initiated or prosecuted in Landlord's name. In such case, Landlord shall cooperate, as Tenant reasonably requests, to permit the Contest to be prosecuted in Landlord's name. Landlord shall give Tenant any documents, deliveries, and information in Landlord's control and reasonably necessary for Tenant to prosecute its Contest. Landlord shall otherwise assist Tenant in such Contest as Tenant reasonably requires. Tenant shall pay all reasonable costs and expenses, including Legal Costs, of any Contest. Tenant shall, at Landlord's request, advance (when Landlord incurs them) such reasonable costs and expenses as Landlord incurs or reasonably anticipates incurring, for Tenant's Contest and Landlord's assistance with such Contest.

12.3 **Miscellaneous.** Tenant shall be entitled to any refund of any Real Estate Taxes (and penalties and interest paid by Tenant), to the extent attributable to periods within the Term, whether such refund is made during or after the Term. When Tenant concludes Tenant's Contest of any Real Estate Taxes, Tenant shall pay the amount of such Real Estate Taxes (if any as has been finally determined in such Contest to be due, to the extent attributable to periods within the Term, and any costs, interest, penalties, or other liabilities in connection with such Real Estate Taxes. Upon final determination of Tenant's Contest of a Law, Tenant shall comply with such final determination. Landlord may contest any matter for which Tenant is entitled to prosecute a Contest, but only if: (a) Landlord Notifies Tenant of Landlord's intention to do so; and b) Tenant fails to commence such Contest within 15 days after receipt of such Notice.

12.4 **Contest Security.** Landlord shall promptly release any Contest Security to Tenant after the Contest has been resolved and Tenant has performed its obligations, if any, as determined by such resolution.

13. Insurance

13.1 **Tenant to Insure:** Tenant, and anyone acting under its direction or control or on its behalf, shall, at its own expense, acquire and maintain, or cause to be maintained in full effect, at the commencement of this Lease, and continuing throughout the Term, the types and minimum amounts of insurance coverage specified herein.

13.2 Types and Minimum Amounts of Insurance.

13.2.1 **Worker's Compensation and Employers' Liability Insurance:** Workers' Compensation and other similar insurance required by applicable State or U.S.

federal laws. Limits for such coverage shall be not less than the statutory limits for Worker s Compensation and Employers' Liability coverage with minimum limits of:
\$1,000,000 for Each Accident
\$1,000,000 Disease-Each Employee
\$1,000,000 Disease Policy Limit.

13.2.2 Commercial General Liability: Minimum limits of liability shall be a combined single limit for bodily injury and property damage of \$1,000,000 each occurrence, \$2,000,000 general aggregate, \$2,000,000 products and completed operations aggregate; \$1,000,000 Personal and Advertising Injury, \$250,000 Fire Legal Liability, \$5,000 any one person Medical Expense limit Such insurance shall include Premises Operations; Products - Completed Operations; Blanket Contractual Liability; Personal and Advertising Injury; Fire Legal Liability; Employees Named as Additional Insureds; Medical Expense and coverage for independent contractors. If coverage is written on a claims-made basis, the Tenant warrants that any retroactive date applicable to coverage under the policy precedes the Term; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of three 3 years beginning from the end of the Term. The policy and certificate of insurance shall further contain a provision that the general aggregate limit applies exclusively to the Premises and the operations conducted thereon.

13.2.3 Automobile Liability: Minimum limits of liability shall be a combined single limit for bodily injury and property damage of \$1,000,000 for each occurrence and annual aggregate for any owned, leased and non-owned automobiles.

13.2.4 All Risk Property: This insurance shall provide All Risk Property Coverage including the perils of wind including named windstorm, earthquake, and flood) against damage to the Premise and the Facility. The amount of coverage shall be purchased on a full replacement cost basis (no coinsurance shall apply except for earthquake and flood perils which shall be no less than 40% of the replacement value of the Facility up to Twenty Million Dollars (\$20,000,000 , if such insurance amounts are appropriate and available on commercially reasonable terms. Such coverage may allow for other reasonable sublimits. Tenant will, at its own expense, at all times during the Term effect and maintain coverage for Business Income with Extra Expense Insurance in an amount sufficient to insure payment of Fixed Rent and Additional Rent and other fixed costs, for a period of not less than twelve 12) months, during any interruption of Tenant's business by reason of the Premises or Tenant s business personal property being damaged by fire or other perils covered under an All Risk Property policy.

13.2.5 Builders and Installation Risk. Tenant will at its own expense effect and maintain during the whole of the Term builder s and installation risk insurance while the Premises or any part thereof are under construction, written on the Builders Risk Completed Value form nonreporting full coverage), including coverage on equipment, machinery, materials, etc. not yet installed but to become a permanent part of the improvements.

13.2.6 **Umbrella Liability:** Tenant will at its own expense effect and maintain during the whole of the Term Umbrella Liability Insurance providing excess coverage over Commercial General Liability, Employer's Liability, and Automobile Liability Insurance. The Umbrella Liability policy shall be written on an "occurrence" form with a limit of liability of not less than \$20,000,000 per policy year and a self-insured retention and/or deductible no greater than \$25,000.00.

13.3 **Form of Policies:**

13.3.1 **Form and Substance:** All insurance required to be furnished by Tenant hereunder shall be pursuant to policies in form and substance satisfactory to Landlord, and issued by a company authorized by law to issue such insurance in the State of Hawaii on an admitted or non-admitted basis, and with an A.M. Best Financial Strength Rating of "A-" or better, and an A.M. Best Financial Size Category of "VII" or higher. In the event that such rating system is altered or eliminated, then the insurer shall have a rating comparable to such A-, VII from a comparable rating service that has been adopted for standard use in the insurance industry.

13.3.2 **Required Provision:** All insurance policies shall:

(a) **Additional Insured:** The insurance policies specified herein shall name Landlord, together with its affiliates, including but not limited to Lāna‘i Island Holdings, LLC, and their respective members, officers, employees, agents, successors and assigns ("Landlord Group" , as an additional insured, as its interests may appear, with respect to any and all third party bodily injury and/or property damage claims, including completed operations, arising from Tenant's performance of this Lease. All Risk Property Insurance shall include Landlord Group as loss payee, as its interest may appear. Coverage must be primary in respect to the additional insured. Any other insurance carried by the Landlord will be excess only and not contribute with this insurance.

b) **Severability of Interest:** Apply separately to each insured against whom claim is made or suit is brought.

(c) **Waiver of Subrogation:** Tenant shall cause its insurers to waive all rights or subrogation which Tenant or its insurers may have against Landlord Group.

(d) The policies and certificate of insurance shall also specifically provide the following or comparable language: "**It is further agreed that such insurance is afforded by this policy for the benefit of the Additional Insured shall be primary insurance, and any other insurance maintained by the Additional Insured shall be excess and non-contributory.**"

13.3.3 **All Insurance:** All insurance shall:

(a) **No Premiums:** Not require Landlord to pay any premiums.

b) **No Partnership:** The inclusion of Landlord Group as Additional Insured is not intended to, and shall not make them or any of them, a partner or joint venture with Tenant in the operation of Tenant's Facility in, on, over, under or about the Premises.

(c) **Deductibles:** Any insurance required hereunder may provide for deductibles or self-insured retentions which are reasonable and prudent in relationship to the soundness of Tenant's financial condition at the sole discretion of Landlord. Any deductibles or self-insured retention in excess of \$25,000 shall be disclosed to Landlord. Any deductible shall be the responsibility of Tenant.

13.3.4 **Certificate of Insurance:** Evidence of insurance for the coverage specified herein shall be provided to Landlord before the commencement of the Lease. Within 30 Days of any change of any policy and upon renewal of any policy, Tenant shall provide certificates of insurance to Landlord. During the Term, Tenant, upon Landlord's reasonable request, shall make available to Landlord for its inspection at Tenant's designated location, certified copies of the insurance policies described herein. Receipt of any evidence of insurance showing less coverage than requested is not a waiver of Tenant's obligations to fulfill the requirements.

13.3.5 **Notification:** In the event Tenant receives notice of cancellation or non-renewal of any insurance in accordance with policy provisions, Tenant shall immediately provide verbal and written notice to Landlord. In the event Tenant chooses to voluntarily cancel, non-renew, or reduce the scope of coverage or limits of liability, Tenant shall notify Landlord in writing at least thirty (30) days prior to such cancellation, non-renewal, or reduction in scope of coverage or limits of liability. In any event, the cancellation or non-renewal of any insurance shall not be construed as a limitation of any kind on Tenant's obligations to indemnify, defend, insure, and hold harmless, as may be found anywhere in this or any other document.

13.4 **Annual Review by Landlord:** The coverage limits shall be reviewed annually by Landlord and if, in Landlord's discretion, Landlord determines that the coverage limits should be increased, Landlord shall so notify Tenant. Tenant shall, within thirty (30) Days of notice from Landlord, increase the coverage as directed in such notice and the costs of such increased coverage limits shall be borne by Tenant.

13.5 **No Limitation:** Tenant's procurement and maintenance of insurance, or the delivery of Certificates of Insurance or other written evidence of insurance in form and substance acceptable to Landlord shall not be construed as a limitation of any kind on Tenant's obligations to indemnify, defend, insure, and hold harmless, as may be found anywhere in this or any other document.

No Representation of Coverage Adequacy: By requiring insurance herein, Landlord does not represent that coverage and limits will necessarily be adequate to protect Tenant,

and such coverage and limits shall not be deemed as a limitation on Tenant's liability under the indemnities granted to Tenant in this Lease.

Loss or Damage to Improvements. In every case of loss or damage to any Improvements on the Land, Tenant shall with all reasonable speed, rebuild, repair or otherwise reinstate the Improvements in accordance with the original plans or such modified plans conforming to laws and regulations then in effect as approved in writing by Landlord. Approval by Landlord shall not be unreasonably withheld, delayed or conditioned. All proceeds of such insurance (excluding the proceeds of any rental value or use and occupancy insurance of Tenant, whether held by Tenant or by Insurance Trustee, shall be used for such purpose, and Lessee will make up any deficiency in the insurance proceeds from its own funds.

14. LOSSES AND LOSS PROCEEDS

14.1 **Notice.** If either party becomes aware of any Casualty or any actual, threatened, or contemplated Condemnation, then such party shall promptly Notify the other.

14.2 **Casualty.** If a Casualty occurs which is not a Substantial Casualty, then: (a) no Rent shall abate; b this Lease shall not terminate or be impaired; and c Tenant shall Restore with reasonable promptness regardless of cost. If the Casualty is determined to be a Substantial Casualty, then Tenant may, by Notice to Landlord, given within 10 days after such determination, terminate this Lease effective 30 days after such Notice, provided that Tenant assigns to Landlord all proceeds from applicable property insurance policies (and rights thereto) arising from the Casualty.

14.3 **Substantial Condemnation.** If a Substantial Condemnation occurs, then this Lease (except as it relates to allocation of the Condemnation Award) shall terminate on the Condemnation Effective Date. Rent shall be apportioned accordingly. The Condemnation Award shall be allocated as follows:

14.3.1 **Prepayment Premium.** To Leasehold Mortgagee, to the extent that both 1 because of such Condemnation, any Leasehold Mortgagee imposes any fee or charge that such Leasehold Mortgagee could not have collected but for the Condemnation and the related prepayment of such Leasehold Mortgagee's loan; and (2) the Condemnation Award was directly or indirectly increased by such fee or charge.

14.3.2 **Costs and Expenses.** To reimburse Landlord and Tenant (subject to the rights of Leasehold Mortgagees) for their actual costs and expenses, including Legal Costs, incurred in the Substantial Condemnation and determining and collecting the Condemnation Award.

14.3.3 **Tenant's Claim.** Tenant shall, subject to the rights of Leasehold Mortgagees, receive such portion of the Condemnation Award as shall equal the lesser of

(a) all sums secured by all Leasehold Mortgages; and b) the Market Value of the Facility at the Condemnation Effective Date.

14.3.4 **Landlord's Claim.** Landlord shall, subject to the rights of Fee Mortgagees, receive such portion of the Condemnation Award as shall equal the Market Value of the Land, at the Condemnation Effective Date.

14.3.5 **Landlord's Residual Claim.** Landlord shall, subject to the rights of Fee Mortgagees, receive the entire remaining Condemnation Award.

14.4 **Insubstantial Condemnation.** If an Insubstantial Condemnation occurs after the Commencement Date, then any Condemnation Award shall be paid to Depository and applied first toward Restoration, in the same manner as Restoration after Casualty. Whether or not the Condemnation Award is adequate, Tenant shall, at its expense, Restore in compliance with this Lease. After Tenant has completed and fully paid for Restoration, any remaining Condemnation Award shall be distributed to Landlord and Tenant as if it arose from a Substantial Condemnation that affected only the part of the Premises taken, with an equitable allocation of all elements taken into account in determining such distribution.

14.5 **Temporary Condemnation.** If a Temporary Condemnation occurs (a) no Rent shall abate; (b) this Lease shall not terminate or be impaired; and c) Tenant shall receive any Condemnation Award to the extent for periods within the Term), without affecting Tenant's obligations in any way.

14.6 **Use of Loss Proceeds.**

14.6.1 **Assignment to Depository.** All Loss Proceeds shall be paid to Depository, to be disbursed by Depository, subject to the terms of the Senior Leasehold Mortgage and this Lease. If Landlord receives any Loss Proceeds, Landlord shall promptly remit them to Depository.

14.6.2 **Immaterial Loss.** If a Loss is an Immaterial Loss, then (subject to the terms of the Leasehold Mortgage on disbursement of Loss Proceeds to Restore the Depository shall release all Loss Proceeds to Tenant, to be applied first to Restoration.

14.6.3 **Material Loss.** If a Loss is not an Immaterial Loss, then Depository shall retain the Loss Proceeds and pay them over to Tenant from time to time, upon the following terms, for Restoration. Depository shall first reimburse Landlord and Tenant from such Loss Proceeds for their actual, necessary, and proper costs and expenses in collecting such Loss Proceeds. Depository shall release Loss Proceeds to Tenant from time to time as Restoration progresses in accordance with the procedures required by the Leasehold Mortgagee. If no Leasehold Mortgage exists, then Depository shall disburse the Loss Proceeds from time to time pursuant to normal and customary disbursement procedures consistent with this Lease, but excluding any requirement for a guaranty, bond, security, or other credit enhancement or credit support measures.

14.6.4 **Loss Proceeds in Trust.** Until Tenant has completed and paid for Restoration, Tenant shall hold all Loss Proceeds in trust to be used first to Restore and for no other purpose. If any Prohibited Lien is filed against the Premises, Tenant shall not be entitled to receive any further installment of Loss Proceeds until Tenant has satisfied, bonded, or otherwise discharged such Prohibited Lien when and as this Lease requires.

14.6.5 **Remaining Loss Proceeds.** When Tenant has completed and paid for Restoration, Depository shall release to Tenant, and Tenant may retain (subject to rights of Leasehold Mortgagees) any remaining Loss Proceeds.

14.6.6 **Insufficient Restoration Funds.** If Restoration Funds are insufficient to Restore, then Tenant shall nevertheless Restore at its expense. Depository shall not release any Loss Proceeds until and unless Tenant has expended on such Restoration an amount equal to any such insufficiency.

14.7 **Disputes.**

14.7.1 **Good Faith Negotiations.** Except as otherwise expressly set forth in this Lease, before submitting any dispute about a Loss (including its characterization, Restoration, timing of Restoration, Loss Proceeds, Restoration Funds, or the use of such proceeds or funds to dispute resolution or litigation, the presidents, vice presidents, or authorized delegates from both Landlord and Tenant having full authority to settle the dispute shall personally meet in Hawaii and attempt in good faith to resolve the dispute (“**Management Meeting**”). Landlord and Tenant shall endeavor to hold the Management Meeting within thirty (30) days after the date of a request for a Management Meeting. Landlord and Tenant shall not file a complaint or initiate other formal dispute resolution proceedings until ninety (90) days after the date of a request for a Management Meeting, except as might be necessary to preserve a right or claim that would expire during the ninety-day period.

15. **LANDLORD’S TRANSFERS**

15.1 **Landlord’s Right to Convey.** Landlord may Transfer the Fee Estate from time to time. Landlord will promptly Notify Tenant of a Transfer.

15.2 **Release of Landlord.** Upon any Transfer of the entire Fee Estate in compliance with this Lease, the grantor shall be automatically freed and relieved from all liability (excluding liability previously accrued) for performance of any covenants or obligations to be performed by Landlord after the Transfer, provided that such successor Landlord assumes Landlord’s past, present, and future obligations under this Lease. This Lease shall bind Landlord only while Landlord owns the Fee Estate, except as to any liabilities and obligations accrued before the date of Transfer of the Fee Estate.

16. TENANT'S TRANSFERS

16.1 **Tenant's Limited Right.** Tenant may only Transfer this Lease to an assignee of all of the rights and obligations of the Seller under the Power Purchase Agreement and only after obtaining Landlord's written consent which may be withheld in Landlord's sole discretion. Tenant may not Transfer this Lease to any other Person, and any such Transfer shall be void. Any permitted assignee of Tenant shall assume all obligations and liabilities of Tenant under this Lease. Tenant shall pay all transfer and other taxes payable on account of any Transfer by Tenant or any holder of any Equity Interest in Tenant. Tenant shall promptly Notify Landlord of any Transfer. No Transfer shall affect any obligations of Tenant or rights of Landlord under this Lease.

16.2 **Subleases.** Tenant shall not enter into or Modify any Sublease, without Landlord's prior written consent which may be withheld in Landlord's sole discretion. No Sublease shall affect any obligations of Tenant or rights of Landlord under this Lease, all of which shall continue in full force and effect notwithstanding any Sublease. Any Sublease shall be subject in all respects to the terms and conditions of this Lease except that, unless terminated sooner under the terms thereof, any such Sublease shall expire no later than one hour before the Expiration Date. The fact that any Subtenant causes any Default shall not relieve Tenant of Tenant's obligation to cure it. Tenant shall take all steps reasonable and necessary to prevent any such Default.

16.3 **Conditions to Effectiveness of Certain Transactions.** No assignment of this Lease or Sublease shall be effective or have any validity unless and until such assignment or Sublease otherwise complies with this Lease and Landlord has received: (a) in the case of an assignment, an executed counterpart of the assignment and an assumption of this Lease by the assignee, in recordable form, effective as of the date of assignment; b) in the case of a Sublease, a copy of the executed Sublease complying with this Lease; and c) Notice of the assignee or Subtenant.

17. LEASEHOLD MORTGAGE

17.1 **Leasehold Mortgage.** Provided that any Monetary Default or material Nonmonetary Default has been, or simultaneously is, cured, Tenant may grant a Leasehold Mortgage to a Financing Party under the Power Purchase Agreement in connection with a permitted financing under the Power Purchase Agreement.

17.2 **Leasehold Mortgagee's Remedies.** Without Landlord's consent, at any time (a) any Leasehold Mortgagee may initiate and complete any Foreclosure Event and exercise any other rights and remedies against Tenant and the Leasehold Estate (but not the Fee Estate) under its Leasehold Mortgage; and b) any transferee through a Foreclosure Event, and its successors and assigns, may assign this Lease to a Person who simultaneously assumes all of the rights and obligations of the Seller under the Power Purchase Agreement.

17.3 Lease Impairments. Any Lease Impairment made without Leasehold Mortgagee's consent shall (at Leasehold Mortgagee's option) be null, void, and of no force or effect, and not bind Tenant, Leasehold Mortgagee, or New Tenant.

17.4 Notices. If any Default occurs for which Landlord intends to exercise any remedy, Landlord shall promptly give Leasehold Mortgagee a Notice of Default.

17.5 Right to Cure; Indemnity. Any Leasehold Mortgagee shall have the right, but not the obligation, to perform any obligation of Tenant under this Lease and to cure any Default under the terms and conditions provided in this Section 17.5. Landlord shall accept performance by or at the instigation of a Leasehold Mortgagee in fulfillment of Tenant's obligations, for the account of Tenant and with the same force and effect as if performed by Tenant, provided that such performance is rendered within the cure period that applies to a Leasehold Mortgagee under this Lease under this Section 17.5.

17.5.1 Opportunity to Cure. Landlord shall accept Leasehold Mortgagee's cure of any Default at any time until 90 days after Leasehold Mortgagee has received the Notice of Default for that Default, provided Landlord has received a Notice of Intent to Cure from Leasehold Mortgagee on or by 30 days after Leasehold Mortgagee's receipt of the Notice of Default. If Landlord does not receive a timely Notice of Intent to Cure under the preceding sentence, Landlord may terminate this Lease under Section 19.2.1 or exercise any other Remedies as may be available at law or in equity or under any terms of this Lease. If Landlord receives a timely Notice of Intent to Cure and Leasehold Mortgagee cannot reasonably cure any Nonmonetary Default within 90 days after receiving the Notice of Default for that Default, Leasehold Mortgagee shall have such further time as it reasonably needs so long as it proceeds with the diligence expected of an experienced independent power producer willing and able to exert commercially reasonable efforts to achieve such cure, but in any event no longer than 180 days. If Leasehold Mortgagee cannot reasonably cure a Default without possession, or if any Tenant-Specific Default s occur s), Leasehold Mortgagee shall be entitled to such additional time as it reasonably needs to consummate a Foreclosure Event and obtain possession, provided Leasehold Mortgagee timely exercises its cure rights for all other Defaults, and completes the Foreclosure Event within 365 days. If Leasehold Mortgagee consummates a Foreclosure Event, Landlord shall waive all Tenant-Specific Defaults, provided that all other Defaults are cured.

17.5.2 Indemnity for Cure Activities. Notwithstanding anything to the contrary in this Lease, if any Leasehold Mortgagee (or a representative of Leasehold Mortgagee) desires to enter the Premises to cure any Default, Leasehold mortgagee may enter the Premises to seek to cure a Default. This right or its exercise shall not be deemed to give Leasehold Mortgagee possession. By entering the Premises, such Leasehold Mortgagee shall be deemed to have agreed to Indemnify Landlord in the same manner as this Lease requires Tenant to Indemnify Landlord, but solely regarding direct damages that Landlord suffers as a result of any acts or omissions of such Leasehold Mortgagee or its representative on or in the Premises in seeking to cure any such Default.

17.6 Cure Rights Implementation. Whenever Leasehold Mortgagee's time to cure a Default or consummate a Foreclosure Event has not expired, provided that Leasehold Mortgagee has timely provided Landlord with a Notice of Intent to Cure pursuant to Section 17.5.1 above, Landlord shall not terminate this Lease, accelerate any Rent, or otherwise interfere with Tenant's or Leasehold Mortgagee's possession and quiet enjoyment of the Leasehold Estate.

17.7 New Lease. If this Lease terminates for any reason except with Leasehold Mortgagee's consent or because of a Total Loss, even if Leasehold Mortgagee failed to timely exercise its cure rights for a Default, Landlord shall promptly give Leasehold Mortgagee a Lease Termination Notice. By giving notice to Landlord on or before the day that is 30 days after Leasehold Mortgagee receives Landlord's Lease Termination Notice, Leasehold Mortgagee may require Landlord to promptly enter into a New Lease with New Tenant. Landlord need not do so, however, unless New Tenant has, consistent with the Lease Termination Notice: a) cured all reasonably curable Defaults except Tenant-Specific Defaults; b) reimbursed Landlord's reasonable costs and expenses (including reasonable attorneys' fees and expenses) to terminate this Lease, recover the Premises, and enter into the New Lease; and c) assumed the Power Purchase Agreement, or with Landlord's consent, arranged for the assumption of the Power Purchase Agreement by the New Tenant.

17.8 New Lease Implementation. If Leasehold Mortgagee timely requests a New Lease in conformity with this Lease, then from the date this Lease terminates until the parties execute and deliver a New Lease, Landlord shall not: (a) operate the Premises in an unreasonable manner; b) terminate Sublease s) except for the Subtenant's default; or (c) lease any Premises except to New Tenant. When the parties sign a New Lease, Landlord shall transfer to New Tenant and New Tenant shall accept all Subleases (including any security deposits Landlord held, service contracts, and Premises operations.

17.9 Certain Proceedings. If Landlord or Tenant initiates any mediation, litigation, or other dispute resolution proceeding affecting this Lease, then the parties shall simultaneously Notify Leasehold Mortgagee. Leasehold Mortgagee may participate in such proceedings on Tenant's behalf, or exercise any or all of Tenant's rights in such proceedings, in each case (at Leasehold Mortgagee's option) to the exclusion of Tenant.

17.10 No Merger. If the Leasehold Estate and the Fee Estate are ever commonly held, they shall remain separate and distinct estates and not merge) without Leasehold Mortgagee's and Fee Mortgagee's consent.

17.11 Multiple Leasehold Mortgages. If at any time multiple Leasehold Mortgagees exist: a) any consent by or notice to Leasehold Mortgagee refers to all Leasehold Mortgagees; b) except under clause (a), the most senior Leasehold Mortgagee may exercise all rights of Leasehold Mortgagee s), to the exclusion of junior Leasehold Mortgagee(s); (c) to the extent that the most senior Leasehold Mortgagee declines to do

so, any other Leasehold Mortgagee may exercise those rights, in order of priority; and if Leasehold Mortgagees do not agree on priorities, a written determination of priority issued by a title insurance company licensed in the State (or such insurer's designated authorized title agent, e.g. Title Guaranty of Hawaii, Inc.), selected by Landlord in its sole discretion, shall govern.

17.12 Further Assurances. Upon request from Tenant or any Leasehold Mortgagee (prospective or current), Landlord shall promptly, under documentation reasonably satisfactory to the requesting party and the Landlord: a) agree directly with Leasehold Mortgagee that it may exercise against Landlord all Leasehold Mortgagee's rights in this Lease so long as Leasehold Mortgagee complies with all terms and conditions of this Lease in connection with the exercise of such remedies; and b) certify (subject to any then-existing exception(s) reasonably specified) that this Lease is in full force and effect, that no Lease Impairment has occurred, that to Landlord's knowledge no Default exists, the date through which Rent has been paid, and other similar matters as reasonably requested and mutually agreeable between Landlord and such Leasehold Mortgagee.

18. QUIET ENJOYMENT; TITLE TO CERTAIN PREMISES; CERTAIN AGREEMENTS

18.1 Quiet Enjoyment. So long as this Lease has not been terminated, Landlord covenants that Tenant shall and may peaceably and quietly have, hold, and enjoy the Premises for the Term, subject to the terms of this Lease, without molestation, hindrance, or disturbance by or from Landlord or anyone claiming by or through Landlord or having title to the Premises paramount to Landlord, and free of any encumbrance created or suffered by Landlord, except Permitted Exceptions.

18.2 Access and Inspection. Notwithstanding anything to the contrary in this Lease, Landlord and its agents, representatives, and designees may enter the Premises upon reasonable Notice to: (a) ascertain whether Tenant is complying with this Lease and the Power Purchase Agreement; (b) cure Tenant's Defaults; (c) inspect the Premises and any Construction; (d) perform such tests, borings, and other analyses as Landlord determines may be necessary or appropriate relating to non compliance with any Law or possible Hazardous Substances Discharge; or (e) show the Premises to a prospective Transferee or Fee Mortgagee. In entering the Premises, Landlord and its designees shall not unreasonably interfere with operations on the Premises and shall comply with Tenant's reasonable instructions. Landlord shall Indemnify Tenant against any claims arising from Landlord's entry upon the Premises (except upon termination of this Lease or an Event of Default).

18.3 Title. Notwithstanding anything to the contrary in this Lease, all Improvements located in, on, or at the Premises or otherwise constituting part of the Premises shall during the Term be owned by, and belong to, Tenant. All benefits and

burdens of ownership of the foregoing, including title, depreciation, tax credits, and all other tax items, shall be and remain in Tenant during the Term.

19. EVENTS OF DEFAULT; REMEDIES

19.1 **Definition of “Event of Default.”** An “Event of Default” means the occurrence of any one or more of the following:

19.1.1 **Monetary Default.** If a Monetary Default occurs and continues for 30 days after Notice from Landlord, specifying in reasonable detail the amount of money not paid and the nature and calculation of each such payment.

19.1.2 **Prohibited Liens.** If Tenant fails to comply with any obligation regarding Prohibited Liens and does not remedy such failure within 15 days after Notice from Landlord.

19.1.3 **Power Purchase Agreement.** If a Default by Tenant occurs under the Power Purchase Agreement, which continues beyond any cure or grace period allowed under the Power Purchase Agreement.

19.1.4 **Bankruptcy or Insolvency.** If Tenant ceases to do business as a going concern, ceases to pay its debts as they become due or admits in writing that it is unable to pay its debts as they become due, or becomes subject to any Bankruptcy Proceeding (except an involuntary Bankruptcy Proceeding dismissed within 180 days after commencement), or a custodian or trustee is appointed to take possession of, or an attachment, execution or other judicial seizure is made with respect to, substantially all of Tenant’s assets or Tenant’s interest in this Lease (unless such appointment, attachment, execution, or other seizure was involuntary and is contested with diligence and continuity and vacated and discharged within 180 days).

19.1.5 **Nonmonetary Default.** If any other Nonmonetary Default occurs and Tenant does not cure it within 30 days after Notice from Landlord describing it in reasonable detail, or, in the case of a Nonmonetary Default that cannot with due diligence be cured within 30 days from such Notice, if Tenant shall not (a) within 30 days from Landlord’s Notice advise Landlord of Tenant’s intention to take all reasonable steps to cure such Nonmonetary Default; b) duly commence such cure within such period, and then diligently prosecute such cure to completion; and (c) complete such cure within a reasonable time under the circumstances, but in any event within 90 days from the receipt of such Notice.

19.2 **Remedies.** If an Event of Default occurs, then Landlord shall, at Landlord’s option, have any or all of the following remedies, all cumulative (so exercise of one remedy shall not preclude exercise of another remedy), in addition to such other remedies as may be available at law or in equity or under any other terms of this Lease. Landlord’s remedies include:

19.2.1 **Termination of Tenant's Rights.** Landlord may terminate Tenant's right to possess the Premises by any lawful means, in which case this Lease and the Term shall terminate, such date of termination shall be the Expiration Date, and Tenant shall immediately surrender possession to Landlord.

19.2.2 **Taking Possession.** Landlord may re-enter and take possession of the Premises with process of law, whether by summary proceedings or otherwise, and remove Tenant, with or without having terminated this Lease, and without thereby being liable for damages or guilty of trespass. This is intended to constitute an express right of re-entry by Landlord. Except as expressly provided in this Lease or prohibited by Law, Tenant, for and on behalf of itself and all persons claiming by, through or under Tenant, expressly waives any right to service of notice of intention to re-enter provided in any Law and any and all right of redemption provided by any Law, or re-entry or repossession or to restore the operation of this Lease if Tenant is dispossessed by a judgment or by writ of any court or judge or in case of re-entry or repossession by Landlord or any expiration or termination of this Lease. No re-entry by Landlord, whether had or taken under summary proceedings or otherwise, shall absolve or discharge Tenant from liability under this Lease. The terms "enter," "re-enter," "entry," and "re-entry," as used in this Lease, are not restricted to their technical legal meanings.

19.2.3 **Suits Before Expiration Date.** Landlord may sue for damages or to recover Rent from time to time at Landlord's election.

19.2.4 **Receipt of Moneys.** No receipt of money by Landlord from Tenant after termination of this Lease, or after the giving of any notice of termination of this Lease, shall reinstate, continue, or extend this Lease or affect any notice theretofore given to Tenant, or waive Landlord's right to enforce payment of any Rent payable or later falling due, or Landlord's right to recover possession by proper remedy, except as this Lease expressly states otherwise, it being agreed that after service of notice to terminate this Lease or the commencement of suit or summary proceedings, or after final order or judgment for possession, Landlord may demand, receive, and collect any moneys due or thereafter falling due without in any manner affecting such notice, proceeding, order, suit or judgment, all such moneys collected being deemed payments on account of use and occupation or, at Landlord's election, on account of Tenant's liability.

19.2.5 **No Waiver.** No failure by Landlord to insist upon strict performance of any covenant, agreement, term, or condition of this Lease or to exercise any right or remedy upon a Default, and no acceptance of full or partial Rent during continuance of any such Default, shall waive any such Default or such covenant, agreement, term, or condition. No covenant, agreement, term, or condition of this Lease to be performed or complied with by Tenant, and no Default, shall be Modified except by a written instrument executed by Landlord. No waiver of any Default shall Modify this Lease. Each and every covenant, agreement, term, and condition of this Lease shall

continue in full force and effect with respect to any other then-existing or subsequent Default of such covenant, agreement, term or condition of this Lease.

19.2.6 **Security Devices.** Landlord may change the locks and other security devices providing admittance to the Premises and Tenant agrees that any such exercise by Landlord shall not be deemed to be unreasonable or a breach of the peace.

19.2.7 **Conditional Limitation.** Landlord may serve upon Tenant a written 30-day notice of cancellation and termination of this Lease. Upon the expiration of such 30-day period, this Lease and the Term shall automatically and without any action by anyone terminate, expire, and come to an end, by the mere lapse of time, as fully and completely as if the expiration of such 30-day period were the Expiration Date. The passage of such 30-day period constitutes the limit beyond which Tenant's tenancy no longer exists. Tenant shall then quit and surrender the Premises to Landlord but remain liable as this Lease provides. It is a conditional limitation of this Lease that the Term shall terminate and expire as set forth in this paragraph. This paragraph is intended to establish a conditional limitation and not a condition subsequent. Nothing in this paragraph shall limit Landlord's right to commence and prosecute a summary possession proceeding under Chapter 666 of the Hawaii Revised Statutes.

19.2.8 **Damages.** Landlord may recover from Tenant all damages Landlord incurs by reason of Tenant's Default, including reasonable costs of recovering possession, reletting the Premises, and any and all other damages legally recoverable by Landlord, and reimbursement of Landlord's reasonable out of pocket costs, including Legal Costs and bank fees for dishonored checks. Such damages shall include, at Landlord's election, either a) the present value, calculated at a discount rate equal to the then-current Prime Rate of the excess of the total Fixed Rent under this Lease over the fair market rental value of the Premises for the balance of the Term; or b) the Rent payable to Landlord provided for in this Lease, when and as due and payable under this Lease, less (in the case of this clause b) only) Landlord's actual proceeds of reletting less Landlord's actual reasonable costs of reletting. Landlord may recover such damages at any time after Tenant's default, including after expiration of the Term. Notwithstanding any Law to the contrary, x Landlord need not commence separate actions to enforce Tenant's obligations for each month's Rent not paid, or each month's accrual of damages for Tenant's Default, but may bring and prosecute a single combined action for all such Rent and damages; and (y) Landlord may not recover any consequential damages for Tenant's Default.

19.2.9 **Injunction of Breaches.** Whether or not an Event of Default has occurred, Landlord may obtain a court order enjoining Tenant from continuing any Default or from committing any threatened Default. Tenant specifically and expressly acknowledges that damages would not constitute an adequate remedy for any Nonmonetary Default.

19.2.10 **Continue Lease.** Landlord may at Landlord's option maintain Tenant's right to possession. In that case, this Lease shall continue and Landlord may continue to enforce it, including the right to collect Rent when due and any remedies for nonpayment.

19.2.11 **Restoration Funds.** Upon any termination of this Lease, to the extent that Landlord or Depository then holds any Restoration Funds, they shall be applied solely as Landlord directs, including as a payment toward any sums then payable to Landlord.

19.3 **Proceeds of Reletting.** Landlord shall apply any proceeds of any reletting as follows, without duplication, but including Default Interest on all such sums:

19.3.1 **Landlord's Costs.** *First*, to pay to itself the cost and expense of terminating this Lease, re-entering, retaking, repossessing, repairing, performing any Construction, and the cost and expense of removing all persons and property therefrom, including in such costs reasonable and customary brokerage commissions and Legal Costs;

19.3.2 **Preparation for Reletting.** *Second*, to pay to itself the cost and expense reasonably sustained in securing any new tenants and other occupants, including in such costs all brokerage commissions, Legal Costs, and any other reasonable costs of preparing the Premises for reletting;

19.3.3 **Costs of Maintenance and Operation.** *Third*, to the extent that Landlord shall maintain and operate the Premises, to pay to itself the reasonable cost and expense of doing so; and

19.3.4 **Residue.** *Fourth*, to pay to itself any balance remaining on account of Tenant's liability to Landlord.

19.4 **Tenant's Late Payments; Late Charges.** If Tenant fails to make any payment to Landlord required under this Lease within 10 days after such payment is first due and payable, then in addition to any other remedies of Landlord, and without reducing or adversely affecting any of Landlord's other rights and remedies, Tenant shall pay Landlord within 10 days after demand Default Interest on such late payment, beginning on the date such payment was first due and payable and continuing until the date when Tenant actually makes such payment. In addition, and without limiting any other rights or remedies of Landlord, Tenant shall pay Landlord, as Additional Rent, an administrative charge equal to 3% of any payment that Tenant fails to pay within 10 days after such payment is first due and payable. Such administrative charge is intended to compensate Landlord for the inconvenience and staff time incurred by Landlord to handle the late or missed payment, shall not be deemed a penalty or compensation for use of funds, and shall not be credited against any other obligations of Tenant under this Lease.

19.5 Landlord's Right to Cure. If Tenant at any time fails to make any payment or take any action this Lease requires, then Landlord, after 10 Business Days' Notice to Tenant, or in an emergency with such notice (if any as is reasonably practicable under the circumstances, and without waiving or releasing Tenant from any obligation or Default and without waiving Landlord's right to take such action as this Lease may permit as a result of such Default, may but need not) make such payment or take such action. Tenant shall reimburse Landlord, as Additional Rent, for an amount equal to a all reasonable sums paid, and reasonable costs and expenses (including Legal Costs incurred, by Landlord in exercising its cure rights under this paragraph; and b Default Interest on (a).

19.6 Holding Over. If for any reason or no reason Tenant remains in the Premises after the Expiration Date, or fails to complete a Clean-up under Section 10.11.5, or fails to remove Improvements required to be removed after the Removal Period under Section 20.2, then Landlord will suffer injury that is substantial, difficult, or impossible to measure accurately. Therefore, if Tenant remains in the Premises after the Expiration Date, or fails to complete a Clean-up under Section 10.11.5, or fails to remove Improvements required to be removed after the Removal Period under Section 20.2, for any reason or no reason, then in addition to any other rights or remedies of Landlord, Tenant shall pay to Landlord, as liquidated damages and not as a penalty, for each month (prorated daily for partial months) during which Tenant holds over after the Expiration Date, a sum equal to: twenty percent (20%) of the Land Value, together with all Additional Rent owed for such period.

19.7 Waivers. Landlord and Tenant irrevocably waive all rights to trial by jury in any action, proceeding, counterclaim, or other litigation arising out of or relating to this Lease, the relationship of Landlord and Tenant regarding the Premises, enforcement of this Lease, Tenant's use or occupancy of the Premises, any claim of injury or damage arising between Landlord and Tenant, or any actions of Landlord in connection with or relating to the enforcement of this Lease. Tenant waives any right of redemption provided for by Law. Tenant waives any right to interpose any counterclaim in any action by Landlord to enforce this Lease or Landlord's rights and remedies under this Lease.

19.8 Accord and Satisfaction; Partial Payments. No payment by Tenant or receipt by Landlord of a lesser amount than the amount owed under this Lease shall be deemed to be other than a partial payment on account by Tenant. Any endorsement or statement on any check or letter accompanying any check or payment of Rent shall not be deemed an accord or satisfaction. Landlord may accept any such check or payment without prejudice to Landlord's right to recover the balance of such Rent or pursue any other remedy.

19.9 Miscellaneous. Landlord and Tenant further agree as follows with respect to any Defaults and Landlord's rights and remedies.

19.9.1 **Survival.** No termination of this Lease and no taking possession of or reletting the Premises shall relieve Tenant of its liabilities and obligations hereunder, all of which shall survive such expiration, termination, repossession, or reletting, but subject to any limitations on personal liability or recourse in this Lease.

19.9.2 **Multiple Suits.** Landlord may sue to recover damages, or sum(s) equal to any installment(s) of Rent payable by Tenant, from time to time at Landlord's election. Nothing in this Lease requires Landlord to await the date when this Lease or the Term would have expired absent an Event of Default and a resulting termination of this Lease.

19.9.3 **Receipt of Monies.** Unless such payment shall fully cure all Monetary Defaults, no receipt of moneys by Landlord from Tenant after the giving of a termination notice or a notice to obtain possession, or after the retaking of possession by Landlord as aforesaid, shall reinstate, continue, or extend the Term or affect any notice previously given to Tenant, waive Landlord's right to enforcement of Rent payable by Tenant or thereafter falling due, or waive Landlord's right to recover possession of the Premises. After the service of any such notice, or commencement of any suit or summary proceedings, or after a final order or judgment for possession of the Premises, Landlord may demand, receive, and collect any moneys due or thereafter falling due without in any manner affecting such notice, proceeding, order, suit, or judgment, unless such payments fully cure all Monetary Defaults. Any sums so collected (without thereby curing all Monetary Defaults) shall instead be deemed payments on account of use and occupation of the Premises or, at Landlord's election, to have been made on account of Tenant's liability under this Lease.

19.9.4 **No Double Recovery.** In no event shall Landlord be entitled, directly or indirectly, to recover twice for the same element of Landlord's damages.

20. END OF TERM

20.1 **Improvements.** Upon the termination of this Lease, at Landlord's option (a) all Improvements shall become Landlord's property; or (b) Tenant shall remove all Improvements at no cost to Landlord, and shall leave the Land in a clean and orderly condition free of all debris. Landlord shall Notify Tenant of Landlord's election to have Tenant remove the Improvements not later than ninety (90) days before the Expiration Date.

20.2 **Tenant's Removal of Improvements.** If Tenant is required to remove the Improvements upon termination of the Lease, Tenant shall have reasonable access to the Premises for a period of up to six (6) months after the Expiration Date to dismantle, pack and remove the Improvements from the Premises (the "**Removal Period**"). Tenant shall work promptly and diligently to remove the Improvements. The Removal Period shall end upon Tenant's completion of removal of the Improvements from the Premises. If Tenant fails to remove the Improvements within the Removal Period, the Holding Over provisions of Section 19.6 of this Lease shall apply. The terms and provisions of this

Lease shall apply during the Removal Period, including Tenant's obligations to provide insurance and to Indemnify Landlord.

20.3 Landlord's Removal of Improvements. If Landlord determines that Tenant is not making diligent efforts to remove the Improvements, Landlord shall Notify Tenant of Landlord's intention to remove the Improvements at Tenant's cost. If 30 days after such notice to Tenant Landlord in its reasonable judgment continues to believe Tenant is not diligently removing the Improvements, Landlord may remove the Improvements at Tenant's cost.

20.4 Actions Upon Surrender. Upon the later of (a) any Expiration Date and b) the expiration of the Removal Period:

20.4.1 Condition of Premises. Tenant shall deliver to Landlord possession of the Premises, in the condition this Lease requires, subject to any Loss that this Lease does not require Tenant to Restore.

20.4.2 Surrender of Premises. Tenant shall surrender any right, title, or interest in and to the Premises and deliver such evidence and confirmation thereof as Landlord reasonably requires.

20.4.3 Free and Clear. Tenant shall deliver the Premises free and clear of all: (a) Subleases, and (b) liens except (i) liens that Landlord or any of its agents caused, or (ii) the recorded title exceptions affecting the Fee Estate that are prior to this Lease as of the Commencement Date and listed as exceptions in Tenant's leasehold policy of title insurance for this Lease.

20.4.4 Assignment of Rights. Tenant shall assign to Landlord, without recourse, and give Landlord copies or originals of, all assignable licenses, permits, contracts, warranties, and guarantees then in effect for the Premises.

20.4.5 Orderly Transition. The parties shall cooperate to achieve an orderly transition of operations from Tenant to Landlord without interruption, including delivery of such books and records (or copies thereof) as Landlord reasonably requires.

20.4.6 Real Estate Taxes. The parties shall adjust for Real Estate Taxes and all other expenses and income of the Premises and any prepaid Rent and shall make such payments as shall be appropriate on account of such adjustment in the same manner as for a sale of the Premises (but any sums otherwise payable to Tenant shall first be applied to cure any Default .

20.4.7 Memorandum of Lease. The parties shall terminate the Memorandum of Lease.

20.4.8 Deposits. Tenant shall assign to Landlord, and Landlord shall reimburse Tenant for, all utility and other service provider deposits for the Premises.

21. NOTICES

21.1 **Special Notices.** All Notices of Default, Renewal Notices, and similar substantive Notices shall be in writing and addressed to Landlord and Tenant (and their designated copy recipients), and shall be deemed given to a party when a) delivered to the appropriate address by hand or by nationally recognized overnight courier service (costs prepaid) or (b) received or rejected by the addressee, if sent by certified mail, return receipt requested, in each case to the following addresses and marked to the attention of the person by name or title designated below or to such other address or Person as a party may designate by notice to the other party):

Landlord: Lāna‘i Resorts, LLC
733 Bishop Street, Suite 2000
Honolulu, HI 96813
Attention: Kurt Matsumoto
E-mail: kmatsumoto@pulamalanai.com

With a copy to:
Lāna‘i Resorts, LLC
733 Bishop Street, Suite 2000
Honolulu, HI 96813
Attention: Harrilynn K. Kameenui, Esq.
E-mail: hkameenui@pulamalanai.com

Tenant: _____

Attention: _____
Telephone No.: (____)
Facsimile No.: (____)
E-mail:

21.2 **Ordinary Notices.** Notices in the ordinary course of business with respect to this Lease (for example for the regular payment of Rent under this Lease as opposed to late payments) shall be in writing and addressed to Landlord and Tenant as provided in the foregoing paragraph, and may be sent by first class mail or e-mail, in which case they shall be deemed delivered three Business Days after deposit in the United States mail, provided that no postal strike (or other event likely to disrupt postal service) is then in effect.

21.3 **Change of Address.** Either party may change its address by Notice in compliance with this Lease. Notice of such a change shall be effective only upon receipt.

21.4 **Acknowledgment; Notice by Counsel.** Any party giving a Notice may request the recipient to acknowledge receipt of such Notice. The recipient shall promptly comply with any such request, but failure to do so shall not limit the effectiveness of any Notice. Any attorney may give any Notice on behalf of its client.

22. NONRECOURSE

Notwithstanding anything to the contrary in this Lease, the liability under this Lease of Landlord and its parent, subsidiary (ies), or affiliated corporations or other entities, for damages or otherwise, shall be enforceable against, and shall not extend beyond, their interests in the Premises including the proceeds thereof. No property or assets whatsoever, except Landlord's interest in the Premises (including the proceeds thereof), shall be subject to levy, execution or any other enforcement procedure for the satisfaction of any remedies monetary or otherwise of the other party arising under or in connection with this Lease. The limitation of liability and limitation of remedy in this paragraph shall not apply in any way to, and shall not be construed to limit or preclude, personal liability (if any) arising under any Supplementary Agreement. No shareholder, officer, member, manager, director, agent, or employee of Tenant or Landlord shall have any liability under this Lease, but this shall not limit any liability arising under the express terms of any Supplementary Agreement. (This Lease sometimes refers to this paragraph as the "**Nonrecourse Clause.**")

23. ADDITIONAL DELIVERIES; THIRD PARTIES

23.1 **Estoppel Certificates.** Up to twice a year, each party to this Lease (a "**Requesting Party**") may require the other party (a "**Certifying Party**") to execute, acknowledge, and deliver to the Requesting Party or directly to a designated third party up to four original counterparts of an Estoppel Certificate. The Certifying Party shall sign, acknowledge, and return such Estoppel Certificate within 15 days after request, even if the Requesting Party is in Default. Any Estoppel Certificate shall bind the Certifying Party.

23.2 **Further Assurances.** Each party shall execute and deliver such further documents, and perform such further acts, as may be reasonably necessary to achieve the parties' intent in entering into this Lease.

23.3 **Memorandum of Lease.** Upon request by either, the parties shall promptly execute, acknowledge, and deliver duplicate originals of a Memorandum of Lease. Either party may record such Memorandum of Lease. Any taxes and fees imposed upon such recording shall be paid by Tenant. If the parties amend this Lease, then the parties shall have the same rights and obligations regarding a memorandum of such amendment as they do for the Memorandum of Lease.

23.4 **Modification.** Any Modification of this Lease must be in writing signed by the party to be bound.

23.5 **Successors and Assigns.** This Lease shall bind and benefit Landlord and Tenant and their successors and assigns, but this shall not limit or supersede any Transfer restrictions.

23.6 **No Third-Party Beneficiaries.** Nothing in this Lease confers on any Person (except Landlord, Tenant, Leasehold Mortgagees, and Fee Mortgagees) any right to insist upon, or to enforce against Landlord or Tenant, the performance or observance by either party of its obligations under this Lease.

24. GUARANTY

24.1 **Guaranty.** Concurrently with the execution and delivery of this Lease, Tenant shall deliver to Landlord a Guaranty in the form attached hereto as **Exhibit C** executed by Guarantor and acknowledged.

25. ARCHAEOLOGICAL AND HISTORICAL ITEMS

25.1 **Discovery of Items.** In the event any human remains, artifacts, historical items, or any of them (collectively the “**Discovered Items**”) are discovered on the Premises, Tenant shall, at Tenant’s sole expense and subject to the approval of Landlord, be responsible to: (a) cause all excavation in the immediate area which may damage the Discovered Items and the potential historic site to cease; (b) cause the site to be stabilized and secured to temporarily protect the Discovered Items against damage, theft, or both; (c) cause the Discovered Items to be left untouched so that their archaeological or historical context may be accurately documented; and (d) cause the discovery to be reported immediately to Landlord and to Government as required by applicable Laws. If the artifacts or historical items are found without human remains, and leaving the artifacts or historical items in their stabilized and secured site poses a substantial risk of loss or damage to all or part of them, and their removal is therefore necessary, Tenant shall cause such removal and shall cause any tampering with the artifacts, the historical items, and the site to be minimized as much as possible.

25.2 **Human Remains.** In the case of the discovery of human remains, Tenant shall, at Tenant’s sole expense and in addition to the duties set forth in this section, cause to be prepared and executed a mitigation plan acceptable to Landlord and to Government possessing jurisdiction over such matters. Tenant shall also be responsible to obtain written verification that the mitigation plan has been successfully implemented.

25.3 **Landlord’s Reservation.** If any Discovered Items are discovered, then Landlord shall have the right at all reasonable times to enter the Premises for the purposes of searching for, exploring for, and removing any of the Discovered Items for preservation as permitted by Law. All objects, antiquities and specimens of Hawaiian or other ancient art or handicraft or of prehistoric, historic or archaeological interest found on the Premises belong to and shall remain the property of Landlord.

25.4 Studies by Tenant. In the event any archaeological studies or historic preservation studies are sought to be conducted in or on the Premises, by Tenant or anyone acting by or through Tenant, Tenant shall not permit such studies to be commenced without the prior written consent of Landlord, unless Tenant is required by applicable Law to permit such studies, in which case Landlord's consent shall not be required but Tenant shall provide Landlord with prior Notice of the commencement of such studies and shall advise Landlord of the applicable Law mandating such studies. In any event, Tenant shall upon completion of such studies cause a complete copy of the results of such studies to be provided to Landlord at the earliest opportunity.

26. MISCELLANEOUS

26.1 Confidential Information. Without limitation of the promises in Section 10.12, each party agrees that, except as otherwise provided by applicable Laws, or in connection with proceedings before the State of Hawaii Public Utilities Commission or other governmental body with jurisdiction over the Premises, or in connection with the evaluation for financing of the Premises, or as part of disclosure to its affiliates, attorneys, consultants, and advisers in order to conduct its business or proceedings to enforce this Lease or the Power Purchase Agreement, or to record a Memorandum of Lease under Section 23.3 of this Lease, such party (including its officers, directors, employees, representatives, brokers, attorneys and advisers) shall keep the contents of this Lease and any information related to the Premises, Tenant and the transaction contemplated by this Lease confidential, whether or not marked as "confidential" (collectively, the "**Confidential Information**"). The Confidential Information shall not include any information publicly known, or which becomes publicly known, other than through the acts of a party to the Lease, or any of their respective officers, directors, employees, representatives, brokers, attorneys or advisers. Tenant may retain possession of all or any part of the Confidential Information to the extent such Confidential Information relates solely to the Property and Tenant's operations thereon.

26.2 Costs and Expenses; Legal Costs. In the event of any litigation or dispute between the parties, or claim made by either party against the other, arising from this Lease or the landlord-tenant relationship under this Lease, or Landlord's enforcement of this Lease upon a Default, or to enforce or interpret this Lease or seek declaratory or injunctive relief in connection with this Lease, or to exercise any right or remedy under or arising from this Lease, or to regain or attempt to regain possession of the Premises or terminate this Lease, or in any Bankruptcy Proceeding affecting the other party to this Lease, the prevailing party shall be entitled to reimbursement of its Legal Costs with Default Interest and all other reasonable costs and expenses incurred in enforcing this Lease or curing the other party's default.

26.3 No Consequential Damages. Whenever either party may seek or claim damages against the other party (whether by reason of a breach of this Lease by such party, in enforcement of any indemnity obligation, for misrepresentation or breach of warranty, or otherwise), neither Landlord nor Tenant shall seek, nor shall there be

awarded or granted by any court, arbitrator, or other adjudicator, any speculative, consequential, collateral, special, punitive, or indirect damages, whether such breach shall be willful, knowing, intentional, deliberate, or otherwise. The parties intend that any damages awarded to either party shall be limited to actual, direct damages sustained by the aggrieved party. Neither party shall be liable for any loss of profits suffered or claimed to have been suffered by the other.

26.4 No Waiver by Silence. Failure of either party to complain of any act or omission on the part of the other party shall not be deemed a waiver by the noncomplaining party of any of its rights under this Lease. No waiver by either party at any time, express or implied, of any breach of this Lease shall waive such breach or any other breach.

26.5 Performance Under Protest. If a dispute arises about performance of any obligation under this Lease, the party against which such obligation is asserted shall have the right to perform it under protest, which shall not be regarded as voluntary performance. A party that has performed under protest may institute appropriate proceedings to recover any amount paid or the reasonable cost of otherwise complying with any such obligation, with interest at the Prime Rate.

26.6 Survival. All rights and obligations that by their nature are to be performed after any termination of this Lease shall survive any such termination.

26.7 No Broker. Each party: (a) represents and warrants that it did not engage or deal with any broker or finder in connection with this Lease and no person is entitled to any commission or finder's fee on account of any agreement or arrangement made by such party; and b shall indemnify the other party against any breach of such representation.

26.8 Unavoidable Delay. Each party's obligation to perform or observe any nonmonetary obligation under this Lease shall be suspended during such time as such performance or observance is prevented or delayed by Unavoidable Delay.

27. INTERPRETATION, EXECUTION, AND APPLICATION OF LEASE

27.1 Captions. The captions of this Lease are for convenience and reference only. They in no way affect this Lease.

27.2 Counterparts. This Lease may be executed in counterparts.

27.3 Delivery of Drafts. Neither party shall be bound by this Lease unless and until such party shall have executed and delivered at least one counterpart of this Lease. The submission of draft s) or comment s) on drafts shall bind neither party in any way. Such draft s) and comment s) shall not be considered in interpreting this Lease.

27.4 **Entire Agreement.** This Lease contains all terms, covenants, and conditions about the Premises. The parties have no other understandings or agreements, oral or written, about the Premises or Tenant's use or occupancy of, or any interest of Tenant in, the Premises.

27.5 **Governing Law.** This Lease, its interpretation and performance, the relationship between the parties, and any disputes arising from or relating to any of the foregoing, shall be governed, construed, interpreted, and regulated under the laws of the State, without regard to principles of conflict of laws.

27.6 **Partial Invalidity.** If any term or provision of this Lease or its application to any party or circumstance shall to any extent be invalid or unenforceable, then the remainder of this Lease, or the application of such term or provision to persons or circumstances except those as to which it is invalid or unenforceable, shall not be affected by such invalidity. All remaining provisions of this Lease shall be valid and be enforced to the fullest extent Law allows.

27.7 **No Party Deemed Drafter.** No inference in favor of or against any party shall be drawn from the fact that such party has drafted any part of this Lease. The parties have both participated substantially in its negotiation, drafting, and revision, with advice from counsel and other advisers.

27.8 **Reasonableness.** Wherever this Lease states that a party shall not unreasonably withhold approval: (a) such approval shall not be unreasonably delayed or conditioned; (b) no withholding of approval shall be deemed reasonable unless withheld by Notice specifying reasonable grounds, in reasonable detail, for such withholding, and indicating specific reasonable changes in the proposal under consideration that would make it acceptable; and (c) if a party grants its consent (or fails to object) to any matter, this shall not waive its rights to require such consent for any further or similar matter.

IN WITNESS WHEREOF, Landlord and Tenant have executed this Lease as of the Commencement Date.

LĀNA'I RESORTS, LLC

By its Member, Lanai Island Holdings, LLC

By its Manager, LIH Corporation

By _____
Kurt Matsumoto
Its: Vice President

Landlord

By _____
Its

Tenant

TERM SHEET

**GROUND LEASE BETWEEN L NA'I RESORTS, LLC AND _____,
FOR PREMISES LOCATED AT L NA'I CITY, L NA'I
JULY 2020**

THIS TERM SHEET IS PROVIDED FOR GENERAL INFORMATION ONLY. LANDLORD RESERVES THE RIGHT TO REVISE ANY OF THE FOLLOWING TERMS FOR ANY REASON DURING FINAL NEGOTIATIONS

Purpose:	Leasing the Premises for the purpose of building and operating a solar and battery storage facility capable of providing electrical power to MECO's system pursuant to a Power Purchase Agreement ("PPA").
Premises:	Landlord owns the following real property (collectively, the "Premises"): (i) the unsubdivided land described in Exhibit A, consisting of approximately 73 acres of land (the "Land") together with an easement over a roadway (the "Roadway"); (ii) all buildings, structures, and other improvements and appurtenances located on the Land other than any buildings, structures and other improvements or appurtenances that may have been constructed by on or behalf of Tenant prior to the commencement date; and (iii) the appurtenances and all the estate and rights of Landlord in and to the Land.
Commencement Date:	Execution of Lease
Security Deposit:	TBD
Initial Term:	Same Initial Term in PPA
Extended Term:	Same Extended Term in PPA
Fixed Rent (from execution of lease up to commercial operations)	\$200.00 per acre per month, plus all applicable taxes, as long as the PPA remains in effect; or 10% of the Land Value per year, adjusted annually by the CPI Adjustment Factor, commencing on the date a PPA Disconnect occurs and continuing for the period a PPA Disconnect remains in effect.
Fixed Rent (during commercial operations):	50% increase to \$300.00 per acre per month, plus all applicable taxes, as long as the PPA remains in effect; or 10% of the Land Value per year, adjusted annually by the CPI Adjustment Factor, commencing on the date a PPA Disconnect occurs and continuing for the period a PPA Disconnect remains in effect.
Variable Rent:	2% of the monthly gross receipts received during commercial operations from HECO to the Tenant per the negotiated PPA for the Project.
Property Taxes:	Tenant shall pay all Real Estate Taxes and Assessments for the Premises.
Conveyance Tax:	Tenant shall pay the conveyance tax imposed under Hawaii Revised Statutes Chapter 247 due and payable upon the Commencement Date.
Utilities:	Tenant shall arrange and pay for all utility charges, including all installation, maintenance, use and service expenses.
Insurance:	Tenant shall maintain Worker's Compensation, Employer's Liability, Commercial General Liability, Automobile Liability, All Risk Property, Builders and Installation Risk, and Umbrella Liability Insurance Policies in minimum amounts acceptable to Landlord.
Purchase Option:	None
Termination:	This Lease shall expire upon the Expiration Date, termination of the PPA, and the occurrence of an Event of Default

Removal of Improvements:	Upon the termination of the Lease, at Landlord's option (a) all Improvements shall become Landlord's property; or (b) Tenant shall remove all Improvements at no cost to Landlord, and shall leave the Land in a clean and orderly condition free of all debris. Landlord shall Notify Tenant of Landlord's election to have Tenant remove the Improvements not later than ninety (90) days before the Expiration Date.
Lease Guaranty:	Concurrently with the execution and delivery of the Lease, Tenant shall deliver to Landlord a Guaranty in a form acceptable to Landlord.
Assignment and Subletting:	Allowed only with Landlord's prior written consent which may be withheld in Landlord's sole discretion.
Right of First Offer at Expiration Date	Landlord has the right of first offer at the Expiration Date to purchase assets on the Land based on valuation at the end of the Lease.

DRAFT

REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND COMMUNITY-BASED RENEWABLE ENERGY

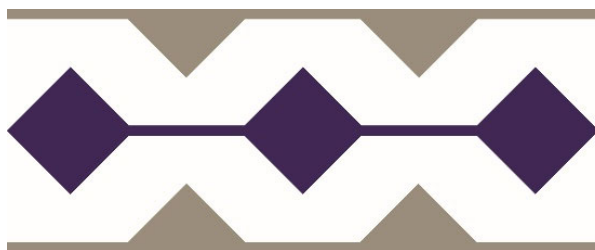
ISLAND OF LĀNA‘Ī

MARCH 30, 2021

Docket No. 2015-0389

*Appendix G – Self-Build Option and
Self-Build Option Team Certification Form*

[NOTE: Please refer to Draft Request for Proposals for Community-Based Renewable Energy Projects for Low- and Moderate-Income Subscribers, Appendix G – Self-Build Option and Self-Build Option Team Certification Form, Exhibit 6 of the March 30, 2021 filing]



**Maui
Electric**

DRAFT
REQUEST FOR PROPOSALS
FOR
COMMUNITY-BASED RENEWABLE ENERGY PROJECTS

ISLAND OF LĀNA‘Ī

MARCH 30, 2021

Docket No. 2015-0389

*Appendix H – Interconnection Facilities Cost
and Schedule Information*



**Hawaiian
Electric**

Hawaiian Electric Company
APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
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Tariff Rule No. 19, approved by the PUC, establishes provisions for Interconnection and Transmission Upgrades (<https://www.hawaiianelectric.com/billing-and-payment/rates-and-regulations/>). The tariff provisions are intended to simplify the rules regarding who pays for, installs, owns, and operates interconnection facilities in the context of competitive bidding. Tariff Rule No. 19 will be utilized as the basis for addressing interconnection and transmission upgrades for any projects developed through this RFP. Proposers will comply with the terms and conditions as specified therein.

SECTION 1 – COST RESPONSIBILITIES

The purpose of Section 1 is to clearly define the cost responsibilities of construction, replacements, and upgrades of Company-Owned Interconnection Facilities (COIF) and existing Company-owned facilities in compliance with Tariff Rule No. 19.

1.1 – DEFINITIONS

1. Betterment – Any upgrading to a facility made solely for the benefit of and at the election of the Company and is not required by applicable laws, codes, Company Standards, and the interconnection requirements in accordance with Tariff Rule No. 19.
2. Company – Hawaiian Electric, Maui Electric, or Hawai‘i Electric Light.
3. Grid Connection Point – The point that the new interconnection facilities associated with the Proposer’s project interconnects to the Company’s existing electrical grid.
4. Interconnection Agreement – The executed contract between the Company and Proposer (e.g. Power Purchase Agreement, Standard Interconnection Agreement, etc.).
5. Point of Interconnection – The point of delivery of energy supplied by Proposer to Company, where the Facility owned by the Proposer interconnects with the facilities owned or to be owned by the Company.
6. Proposer – The developer proposing a renewable project in response to a Company RFP.

1.2 – ABBREVIATIONS

1. ADSS – All Dielectric Self-Supporting
2. COIF – Company-Owned Interconnection Facilities
3. CT – Current Transformer
4. DFR – Digital Fault Recorder
5. DTT – Direct Transfer Trip
6. FS – Facility Study
7. GCP – Grid Connection Point
8. HVAC – Heating, Ventilation, and Air Conditioning
9. IRS – Interconnection Requirements Study (includes both SIS and FS)
10. OPGW- Optical Ground Wire

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11. POI – Point of Interconnection
12. PT – Potential Transformer
13. RTU – Remote Terminal Unit
14. SCADA – Supervisory Control and Data Acquisition
15. SIS – System Impact Study
16. UFLS – Under-Frequency Load Shed

1.3 – FACILITIES AT PROPOSER SITE

1. Proposer shall be responsible for all costs related to COIF at the Proposer site required by any relevant Rule or Tariff, Request for Proposal, and/or the IRS. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Site work (grading, trenching, manholes/handholes, conduits, cable trench, concrete pads/foundations, fencing, roadways/driveways, ground grid, lighting, etc.)
 - c. Substation structures, design, and configuration (i.e., breaker and a half, ring bus, etc.)
 - d. Control equipment enclosure/cabinet
 - e. Equipment (circuit breakers, transformers, relays, switches, arresters, batteries, HVAC, RTU, DFR, DTT, meters, PTs, CTs, etc.)
 - f. Telecommunication equipment (See Telecommunication Facilities section below)
 - g. Electrical work (bussing, wiring, lightning protection, fiber optic cable, etc.)
 - h. Security systems/equipment
2. Company shall be responsible for Betterment costs.

1.4 – STATION POWER FOR COMPANY SWITCHING STATION

1. Station power is required if a new Company switching station or substation is built to allow the interconnection of the Proposer's project. If station power is required, the Proposer shall be responsible for all costs related to the primary and backup station power sources. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Overhead electrical facilities (poles, conductor, insulators, crossarms, guy wires, transformers, etc.)
 - c. Underground electrical facilities (cables, splices, termination, grounding, transformers, switchgears, etc.)
 - d. Step-down transformer
 - e. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - f. Vegetation trimming and traffic control

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2. Options for primary station power sources for the Company's various switching station voltages are:
 - a. Tap off the bus through a step-down transformer for 23kV through 69kV
 - b. 12kV line extension and service transformer for 23kV through 138kV
 - c. Gensets are not an allowable substitute for the above options

1.5 – REMOTE SUBSTATION FACILITIES

1. Proposer shall be responsible for all costs that are solely for the benefit of the Proposer's project, that cannot be used for future system benefit, and that does not provide any benefit to other customers. This may include, but is not limited to:
 - a. Telecommunications cards for DTT (if required)
 - b. Point-to-point microwave facilities between the Proposer's facility and the remote substation (if Proposer chooses that communications option) since there is no way to splice into or multi-link a microwave and it cannot be used for other purposes
2. If the project is interconnecting directly to an existing Company substation, any new equipment required at the substation to accommodate the interconnection will be considered Interconnection Facilities according to Tariff Rule No. 19 and all costs shall be the responsibility of the Proposer. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Site work (grading, trenching, manholes/handholes, conduits, cable trench, concrete pads/foundations, fencing, roadways/driveways, ground grid, lighting, etc.)
 - c. Substation structures
 - d. New control equipment cabinet or existing enclosure expansion
 - e. Equipment (circuit breakers, transformers, relays, switches, arresters, batteries, HVAC, DFR, DTT, meters, PTs, CTs, etc.)
 - f. Electrical work (bussing, wiring, lightning protection, fiber optic cable, etc.)
3. Company shall be responsible for all other costs. This may include, but is not limited to:
 - a. Betterment
 - b. System upgrades, changes, or replacement of existing facilities (e.g. breaker replacements, relay upgrade, transformer installs, Under-Frequency Load Shed (UFLS) settings, etc.)
 - c. Site work associated with those system upgrades (grading, trenching, manholes/handholes, conduits, cable trench, concrete pads/foundations, fencing, roadways/driveways, ground grid, lighting, etc.)
 - d. Substation structures
 - e. New control equipment cabinet or existing enclosure expansion
 - f. Equipment (circuit breakers, transformers, relays, switches, arresters, batteries, HVAC, DFR, DTT, meters, PTs, CTs, SCADA equipment, telecommunications routers, etc.)
 - g. Electrical work (bussing, wiring, lightning protection, fiber optic cable, etc.)

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1.6 – LINE EXTENSION FROM GRID CONNECTION POINT (GCP) TO PROPOSER SITE

1. Proposer shall be responsible for all costs related to the line extension between the GCP and the Proposer site. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Overhead electrical facilities (poles, conductor, insulators, crossarms, guy wires, etc.)
 - c. Underground electrical facilities (cables, splices, terminations, grounding, transformers, switchgears, etc.)
 - d. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - e. Company fiber (ADSS fiber, OPGW shieldwire, splice boxes, etc.)
 - f. Vegetation trimming and traffic control
2. The Company shall be responsible for the following costs:
 - a. Betterment
 - b. Replacement of overhead and underground facilities due to certain pre-existing conditions and not caused by interconnection of the Proposer's project as follows:
 - i. Asset is identified for replacement in Company's 5-year work plans
 - ii. Poles (if not identified in 5-year work plans) that require replacement based on the Company's standards and practices (e.g. NESC remaining strength requirements, mechanical or insect damage, cracked, and excessive checking, leaning, or corrosion) or poles that are overloaded prior to addition of the new line
 - iii. Conductors, hardware, and equipment that have issues requiring replacement for safe/reliable operation (e.g. corrosion, damage, etc.)
 - iv. Facilities that meet any of these criteria will be identified by Company engineers
 - v. Company will pay for a one for one equivalent to current standards, and Proposer will pay for anything above that standard required for their interconnection

1.7 – T&D SYSTEM UPGRADES

1. Company shall be responsible for all costs related to system upgrades or changes required to accommodate the Proposer's project (e.g. reconductoring or recircuiting of existing lines that do not have the required ampacity, re-fusing or re-programming of protective devices upstream of the GCP, etc.)

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1.8 – COMPANY-OWNED FIBER

1. If Company-owned fiber is used to satisfy the communications requirements in the IRS, then the Proposer shall be responsible for all costs related to routing the ADSS fiber or OPGW from the nearest existing splice point to the Proposer site. This may include, but is not limited to:
 - a. Project management, design, permitting/regulatory fees and approvals, land rights, installation labor, inspection, construction management, and testing
 - b. Company fiber-optic cable (ADSS fiber cable or OPGW shieldwire) and associated equipment/hardware (splice boxes, innerduct, vibration dampers, etc.)
 - c. Splicing and Testing of fiber strands
 - d. Pole replacements and additional equipment if needed for additional capacity
 - e. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
 - f. Vegetation trimming and traffic control
2. Company shall be responsible for Betterment costs

1.9 – TELECOMMUNICATION FACILITIES

1. Telecommunication Cabinet
 - a. If a control equipment enclosure will not be built, the Proposer shall be responsible for all costs related to installing a telecommunication cabinet required to accommodate the telecommunication equipment at the Proposer's facility. This may include, but is not limited to equipment racks and ancillary infrastructure, 48V DC Power System (includes 48V DC Charger w/ at least 12-hr battery backup), alarming, and air conditioning
2. Telecommunication Power
 - a. Proposer shall be responsible for all costs related to providing reliable 48V DC power to Company equipment at a new Company switching station or a Proposer-owned station. This may include, but is not limited to battery racks, banks, fuse panels, and associated power system equipment.
3. Fiber Termination Equipment
 - a. If Company-owned fiber is used to satisfy the communication requirements in the IRS, then the Proposer shall be responsible for all costs related to terminating the ADSS fiber or OPGW at the new Company switching station and point of interconnection to Company's existing system. This may include, but is not limited to a fiber termination panel and associated equipment/hardware (fiber guide, splice trays, connectors, etc.)
4. Microwave Radio or Wireless Radio
 - a. If Company-owned microwave radio (6GHz, 10/11 GHz, etc.) or Company-owned wireless radio (900MHz, 450MHz, etc.) is used to satisfy the communications requirements in the IRS, then the Proposer shall be responsible for all costs related to installing the microwave radio/link at the

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new Company switching station and remote site(s). This may include, but is not limited to:

- i. Pre-design requirements (path survey/engineering, FCC frequency coordination, licensing, filings, EME study if required, etc.)
- ii. Project management, design, permitting, regulatory fees and approvals, land rights, labor, inspection, construction management, and testing
- iii. Pole or tower facilities to support the microwave dish and its connection to the microwave equipment (waveguide, cables, conduit, etc.)
- iv. Civil/structural work (survey, grading, trenching, conduits, manholes/handholes, concrete pads, concrete pier foundations, pole hole excavation, etc.)
- v. Antenna system design and installation

5. Leased Service

- a. If 3rd party leased service will provide telecommunication connectivity to the new Company switching station, then the Proposer shall be responsible for all costs related to ordering and installing the leased service at the site. This may include, but not be limited to the initial cost to establish the leased line(s) required for the project, monthly recurring leased cost of the service(s), and on-going maintenance of the service(s).

6. Telecommunication Service Equipment

- a. Telecommunication equipment is required to provide circuits to support the various applications at the new Company switching station. The Proposer shall be responsible for all costs related to installing the telecommunication equipment. This may include, but is not limited to:
 - i. Project management, design, installation, and testing
 - ii. Telecommunication routers, multiplexors, and associated equipment/hardware

1.10 – PROPOSER PAYMENTS

1. The Company shall require upfront payment prior to the commencement of any phase of work based on an estimate of Company costs for that phase. A true-up at the end of the project shall be completed and a refund or bill shall be processed in accordance with the Interconnection Agreement when necessary.
2. Proposer is also responsible for payments to the Company related to service contracts for service power.

SECTION 2 – INTERCONNECTION COSTS

To assist Proposers in assessing the impacts of location on potential projects, the information provided in Section 2 can be used to approximate the cost for Company-Owned Interconnection Facilities (COIF), including substation, telecommunications, security, transmission or distribution

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lines, and project management. This information is based on typical interconnections as shown in Attachment 1 of this Appendix H. Conceptual design is not intended to cover all interconnection requirements. Final interconnection design will be subject to the results of a technical review. The per-unit cost figures below should not be used to create a detailed project estimate. A detailed project estimate typically requires a certain level of engineering to assess project site conditions and to factor in other parameters specific to the project.

The Proposer should identify the components assumed for their project and the quantity assumed for each. Each table below provides notes on the assumptions for each of the unit cost estimates. If a Proposer’s project requirements are different than what is assumed in the notes, the Proposer should identify each difference and provide an estimated additional cost or savings resulting from those different requirements. Please see Attachment 2 for examples of how to apply the per-unit costs provided. All costs provided do not include costs related to Proposer responsibilities including, but not limited to, permitting, land rights, community outreach, biological and/or cultural (archeological) surveys. Proposers should do their own due diligence for these costs.

2.1 – DISTRIBUTION (12KV AND BELOW) INTERCONNECTION

Please refer to Attachment 1 (Miki Basin Interconnection) of this Appendix H for single line diagrams depicting the required interconnection to the Company’s system. Please see Attachment 2 for examples of how to apply the per-unit costs provided. All costs provided in Section 2.1 assume the COIF will be built by the Company.

**A. TYPICAL DISTRIBUTION PRIMARY INTERCONNECTION AT MIKI BASIN
 (ATTACHMENT 1)**

INTERCONNECTION AT MIKI BASIN (<u>ATTACHMENT 1</u>)		
Item	Description	Cost
Substation & Meter Baseline Costs		
21	Components at the Project Site on the Company side of the demarcation as shown in <u>Attachment 1</u> <ul style="list-style-type: none"> • Includes costs for engineering, materials, construction, and testing. • Assumes civil infrastructure and space for COIF is provided by Proposer. • Distribution line extension – See Items 24 and 26 and Section 2.1D. • Telecommunications requirements – See Section 2.1E. • Security requirements – See Section 2.1F. 	\$486,000 / interconnection line
22	Company work for components at Miki Basin PP as shown in <u>Attachment 1</u> <ul style="list-style-type: none"> • Includes engineering, materials, construction, and testing. 	\$600,000 / interconnection line

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INTERCONNECTION AT MIKI BASIN (ATTACHMENT 1)		
Item	Description	Cost
	<ul style="list-style-type: none"> Local SCADA equipment is included. Does not include excavation and fill 	
<u>Notes:</u> a) Assumes construction in 2022. b) Substation relay protection requirements have not been identified so costs are based upon typical line protection relaying requirements. c) Does not include costs for permitting, land rights, or a Relay Coordination Study.		
T&D Baseline Costs		
24	UG Termination to OH Extension <ul style="list-style-type: none"> Includes costs for engineering, materials, construction for UG termination at Proposer site, 100ft UG line extension (1 feeder), 3ph riser with disconnects, and 1 wood pole Add OH line extension – See Item 30 or 32. Add additional UG line extension and riser for 2nd feeder – See Items 33, 34, and 35. Two (2) feeders from the Proposer’s Facility can riser to a single overhead line. Risers and UG line extension should also be added for termination at Miki Basin PP. 	\$114,000 each
26	UG Termination to UG Extension <ul style="list-style-type: none"> Includes costs for engineering, materials, construction for UG termination at Proposer site and 100ft UG line extension (1 feeder) Add UG line extension (above 100ft) – See Item 33. Add an additional feeder for the entire UG length – See Item 34. Feeders can be run in the same conduit and MH system. 	\$87,000 each
<u>Notes:</u> a) Assumes construction in 2022. b) Interconnection will typically require either Item 24 or 26 for work at the Proposer’s site in addition to any line extension above 100ft of UG. c) Includes 100ft UG line extension of one feeder. d) 2-4” conduits required for the UG line extension. e) OH/UG route and civil infrastructure drawings provided by Proposer. f) Civil infrastructure (pads, MH/HHs, conduits, etc.) designed, procured, and installed by Proposer. g) Includes review of Proposer civil infrastructure designs and materials purchased and inspection of Proposer civil infrastructure construction. h) Does not include vegetation clearing, grading, dewatering, permitting or land rights.		

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INTERCONNECTION AT MIKI BASIN (ATTACHMENT 1)		
Item	Description	Cost

B. DISTRIBUTION LINE EXTENSION COSTS

DISTRIBUTION LINE EXTENSION COSTS		
Item	Description	Cost
30	12kV OH accessible (200ft spans, #1/0 AAC)	\$773,000 / mile
32	12kV OH inaccessible (250ft spans, #1/0 AAC)	\$1,676,000 / mile
33	12kV UG (200ft spans, #4/0 AL PEICN)	\$804,000 / mile
34	12kV UG add'l feeder (200ft spans, #4/0 AL PEICN)	\$482,000 / mile
35	12kV 3ph riser w/ disconnects (including pole/anchor)	\$45,000 each
Notes: <ol style="list-style-type: none"> a) Assumes construction in 2022. b) OH assumes wood poles and 3ph overhead conductor with neutral underbuild. c) Accessible assumes vehicles can be used during construction. d) Inaccessible assumes helicopters are needed during construction. e) Includes engineering, materials, construction labor for electrical work, inspection for UG civil infrastructure, and contractor costs for pole/anchor digging. f) OH/UG route and civil infrastructure drawings provided by Proposer. g) Civil infrastructure (pads, MH/HHs, conduits, etc.) designed, procured, and installed by Proposer. h) Does not include vegetation clearing, grading, dewatering, permitting or land rights. 		

C. TYPICAL TELECOMMUNICATIONS REQUIREMENTS FOR DISTRIBUTION INTERCONNECTIONS

1. Interconnection Projects at Miki Basin – See Section 2.4 for costs
 - a. Primary communications links can consist of lease line, licensed radio, fiber or microwave.
 - b. Back-up communications links are required (can consist of lease line, licensed radio, fiber, or microwave).
 - c. Back-up communications links must be transport diverse until the “last mile”.
 - d. Additional analog leased telephone lines are required to support revenue meters (Proposer shall do their own due diligence for costs on this).
2. Requirements are subject to change based on project specific evaluations, technical reviews, or IRS.

D. SECURITY REQUIREMENTS FOR DISTRIBUTION INTERCONNECTIONS

1. For Company-owned equipment within Proposer’s Facility, Company requires:

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- a. Standard 8ft high security fence with 3-strand barbed wire V-top.
 - b. Interior mounted 4' high cattle fencing.
 - c. All gates will be secured using a proprietary padlock system.
 - d. Proposer-owned cabinets/enclosures housing Company equipment shall be secured with a lock provided by Company.
 - e. Company requires 24/7 access to Company facilities within the Proposer facility.
2. Given the size of the Proposer's project requested through this RFP and its criticality to the Company's system, the Company recommends the Proposer consider implementing Tier One security requirements at the Proposer's facility in accordance with Section 2.5B.
 3. See Section 2.5 for more information on Security Requirements.

2.2 – [NOT USED]

2.3 – [NOT USED]

2.4 – TELECOMMUNICATIONS

Please refer to Attachment 1 (Miki Basin Interconnection) of this Appendix H for single line diagrams depicting the required interconnection to the Company's system. Please see Attachment 2 for examples of how to apply the per-unit costs provided.

The communications equipment will require a communications channel(s). Some of the communications channel options include cellular, lease line, licensed radio, fiber, or microwave. The number of communication circuits (primary/backup) and type of communication circuits required will vary depending on the type/size of the project.

A. TELECOMMUNICATIONS BASELINE COSTS

The costs below are high level per unit costs for communications requirements in support of the Project. Sections 2.1E and 2.2B above provide typical scenarios of when these options may be utilized.

TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
Communications Cabinet or Enclosure		
72	Communications Cabinet* with circuits to support SCADA <ul style="list-style-type: none"> • Projects with SCADA and diverse communication circuits 	\$230,000 / site
<u>Notes:</u>		
a) Assumes construction in 2022.		

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TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
	<ul style="list-style-type: none"> b) All projects that require communications will require facilities to store the communications equipment. The example above is provided but other alternatives may be available upon request. c) Cabinet is used to support Company equipment and capable of providing communications circuit for SCADA. d) Communications cabinet cost does not include fiber, microwave, radio equipment or lease circuits. e) Proposer will provide all conduits, foundations, HHs, AC power, grounding as required per Company standards. 	
Cellular or Lease Line Options		
73	Cellular or Lease Line one-time and recurring costs	Will vary based on 3 rd party provider
<u>Notes:</u> <ul style="list-style-type: none"> a) Add cost of Communications Cabinet – See Items 70-72. b) Check with Company to understand the current cellular or lease line requirements. c) Communication circuit requirements will be based on applications needed for the project. d) Company can provide communication circuit interconnection requirements and assist with review of circuit order from the 3rd party provider as needed. e) Proposer to work directly with 3rd party provider if a cellular or lease line circuit is needed. f) Cost will be the responsibility of the Proposer and is to be negotiated with the 3rd party provider. 		
Licensed 900 MHz Radio Option		
74	Licensed 900 MHz Radio Equipment <ul style="list-style-type: none"> • Includes 2 each antenna equipment to create a radio link 	\$168,000 / link
<u>Notes:</u> <ul style="list-style-type: none"> a) Assumes construction in 2022. b) Add cost of Communications Cabinet – See Items 71-72. The radio equipment will be installed within the Communication Cabinet. c) Assumes there is radio line-of-sight clearance between the communication endpoints. d) Assumes FCC licensed 900MHz Frequencies are available. e) Assumes there is an existing structure/building with space available on the Company side to mount the antenna equipment and house the radio equipment. f) Assumes Telecommunications grounding standards are up to date at both sites. g) Assumes 48 V DC power with 12-hour battery backup is available. 		

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TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
	<ul style="list-style-type: none"> h) Does not include special site-specific permit/approval activities that may be required including, but not limited to, Neighborhood Board(s), Conservation District Use Application, Environmental Assessment, Shoreline Management Area approval, biological (endangered species or habitat) surveys, and/or cultural (archeological) surveys or the cost of any migration required for approvals to be granted. Proposers should conduct their own due diligence for these costs. i) Proposer is responsible to install a structure to mount the antenna equipment on the Proposer side and provide any conduit required between the Communications Cabinet and the antenna mount structure. 	
Fiber-Optic Cable Option		
75	New Fiber-only pole line (200' avg spans, 60-strand ADSS) <ul style="list-style-type: none"> • Includes new wood poles 	\$460,000 / mile
76	Fiber underbuild on new or existing pole line (200' avg spans, 60-strand ADSS) <ul style="list-style-type: none"> • Assumes no replacements of existing poles are needed 	\$211,000 / mile
<u>Notes:</u>		
<ul style="list-style-type: none"> a) Assumes construction in 2022. b) Add cost of Communications Cabinet – See Items 70-72. c) Assumes no splices are needed along the route. 		
Microwave Option		
77	Point-to-Point Microwave Link <ul style="list-style-type: none"> • Includes 2 each antenna equipment to create a radio link 	\$836,000 / link
78	50ft Microwave Tower	\$734,000 each
79	100ft Microwave Tower	\$1,066,000 each
<u>Notes:</u>		
<ul style="list-style-type: none"> a) Assumes construction in 2022. b) Add cost of Communications Cabinet – See Items 70-72. c) Assumes there is radio line-of-site clearance between the communication endpoints. d) Assumes FCC licensed microwave frequencies are available. e) Assumes there are existing structures/buildings with space available on both ends to house the radio equipment. f) Assumes Telecommunications grounding standards are up to date at both sites. g) Assumes 48 V DC power with 12-hour battery backup is available. h) Does not include special site-specific permit/approval activities that may be required including, but not limited to, Neighborhood Board(s), Conservation District Use Application, Environmental Assessment, Shoreline Management Area approval, biological (endangered species or habitat) surveys, and/or cultural 		

Hawaiian Electric Company
 APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
 INFORMATION

TELECOMMUNICATIONS BASELINE COSTS		
Item	Description	Cost
	(archeological) surveys or the cost of any migration required for approvals to be granted. Proposers should conduct their own due diligence for these costs.	
i)	Assumes space is available at both ends to construct antenna towers or structures that are rated to survive a Saffir-Simpson category 4 hurricane.	
j)	Other options for Microwave Towers of varying heights may be available.	

2.5 – SECURITY OF COMPANY-OWNED FACILITIES

A. PROPOSER RESPONSIBILITIES AT PROPOSER FACILITY

The Proposer shall be responsible to incorporate security components and systems for **their facilities** that consider the Security Guidelines for the Electricity Sector (CIP-014-2): Physical Security, as published by the North American Electric Reliability Corporation (NERC) and that at a minimum, meet the requirements in Sections 2.1F.

B. NEW COMPANY-OWNED SUBSTATION SECURITY COSTS

Transmission substations (69kV and above) are considered a Tier One facility and require high levels of security due to the critical role they play in the Company’s system. Typical Tier One security requirements may include:

1. FLIR or similar camera monitoring.
2. Secondary perimeter intrusion detection system.
3. Interior video monitoring system with motion detection.
4. Gunfire detection/IP intercom public address system.
5. Electronic card access system for control & microwave houses.
6. Standard 8ft high security fence with 3-strand barbed wire V-top.
7. Interior mounted 4ft high cattle fencing.
8. LED perimeter lighting.
9. All gates secured using a proprietary padlock system.

Security requirements and costs can vary based on many factors including, but not limited to, location, crime rate, environment, aspects of the surrounding area, terrain, accessibility, layout of the facility, etc. The specific requirements for each facility will subject to final review during the design and engineering phase.

Additional information, including the Company’s Physical Security Strategy, is available upon request after execution of an NDA with the Company. The costs below are intended to give Proposers an idea of what the Company costs could be.

Hawaiian Electric Company
 APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
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SUBSTATION SECURITY (COMPANY COSTS)		
Item	Description	Cost
80	Transmission (69kV and above) Substation <ul style="list-style-type: none"> Includes camera system, perimeter fence fiber network, access control system, perimeter intrusion detection, gunfire detection system, and associated conduits, electrical, and junction boxes. 	\$510,000 / site
Notes: <ol style="list-style-type: none"> Assumes a 280ft x 235ft footprint, flat terrain, and accessible. Assumes Proposer is providing the standard 8' high security fence with 3-strand barbed wire V-top, interior mounted 4' high cattle fencing, and LED perimeter lighting. Assumes Company is installing conduits, electrical, and junction boxes. Costs could be reduced if the Proposer installs those as a part of the facility construction. 		

SECTION 3 – [NOT USED]

SECTION 4 – TYPICAL COMPANY DURATIONS FOR INTERCONNECTION PROJECTS

The tables below in Section 4 are to be used as a reference when developing a schedule (required in Appendix B – Proposer’s Response, Section 2.14) to assist Proposers in setting realistic durations and deadlines for critical milestones. These tables represent typical durations for the Company to complete the listed critical milestones that assist in moving the interconnection project through the IRS, Engineering, Procurement, and Construction phases. The durations below do not include time for Proposer to complete items they are responsible for. These high-level typical durations are for planning purposes only and is not intended to cover all project specific requirements. Specific project details can increase or decrease these durations. The detailed project schedule will be determined after the IRS is completed.

4.1 – DISTRIBUTION PROJECTS (COMPANY-BUILD)

Hawaiian Electric Durations to be Considered in Schedules (12kV and Below) General Guidelines for Planning Purposes Only Hawaiian Electric Build ≥ 1 MW		
Milestone	Duration	Notes
IRS Phase		
Model Validation	2-3 months	May increase depending on # of iterations
System Impact Study (SIS)	150 calendar days	Following Model Acceptance

Hawaiian Electric Company
 APPENDIX H - INTERCONNECTION FACILITIES COST AND SCHEDULE
 INFORMATION

Hawaiian Electric Durations to be Considered in Schedules (12kV and Below) General Guidelines for Planning Purposes Only Hawaiian Electric Build \geq 1 MW		
Milestone	Duration	Notes
Facility Study (FS)	40 business days	Following completion of SIS, SLD Acceptance, and Receipt of Developer Drawings and Schedules
Engineering Phase		
30% Design & Review	40 business days	Designs & Reviews for Company-Owned Interconnection Facilities (COIF) & review of Proposer-Owned Interconnection Facilities (SOIF) supporting/impacting COIF
60% Design & Review	50 business days	Designs & Reviews for COIF & review of SOIF supporting/impacting COIF. Following 30% Design acceptance.
90% Design & Review	50 business days	Designs & Reviews for COIF & review of SOIF supporting/impacting COIF. Following 60% Design acceptance
Issued for Construction (IFC) Design & Review	30 business days	Designs & Reviews for COIF & review of SOIF supporting/impacting COIF. Following 90% Design acceptance.
Procurement Phase		
Procurement	9 months	Procurement of materials typically happens at 60% design completion
Construction Phase		
Construction	7-8 months	Based on scope/complexity of work
Acceptance Testing	10 business days	Approximately 2 weeks after construction completion
CSAT	30 business days	To occur after commissioning of Proposer's Facility. Duration depends on Proposer's ability to meet the Performance Standards. Required for project \geq 1 MW

4.2 – [NOT USED]

4.3 – [NOT USED]

4.4 – [NOT USED]

PROJECT EXAMPLES (LANA'I) - APPENDIX H UNIT COST TABLE

Examples provided for illustrative purposes only and is not binding for actual facility costs.
Estimated costs represent Company costs charged to the Proposer.

Miki Basin Interconnection

Example 1

17.5MW project interconnecting to Miki Basin substation. Project interconnects with two (2) outgoing feeders to Miki Basin, limited to 2.2MW each. The 12kV line extension for each feeder includes 200ft total UG. Each feeder risers and taps to a single OH line extension 0.25 miles long. All lines are accessible. Proposer to install 12kV civil infrastructure. Proposer site built per Attachment 1 of this Appendix H. Proposer to provide leased line telecommunications with another provider; back-up communications is required. Company to install Company-owned equipment in Proposer-provided communications cabinet at Proposer site.

Appx H Item	Description	Quantity	Unit	Unit Price (\$)	Total Cost (\$)
21	Company work at Proposer site	2	EA	\$486,000	\$972,000
22	Company work at Miki Basin PP	2	EA	\$600,000	\$1,200,000
24	UG Termination to OH Extension	2	EA	\$114,000	\$228,000
30	12kV OH accessible	0.5	MI	\$773,000	\$386,500
33	12kV UG	0.04	MI	\$804,000	\$30,455
35	12kV 3ph riser	2	EA	\$45,000	\$90,000
72	Comm Cabinet	1	EA	\$192,000	\$192,000
73	Primary Leased line (by Proposer)	1	LS	\$0	\$0
73	Backup Leased line (by Proposer)	1	LS	\$0	\$0
			ESTIMATED TOTAL =		\$3,098,955

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REQUEST FOR PROPOSALS

FOR

VARIABLE RENEWABLE DISPATCHABLE GENERATION

PAIRED WITH ENERGY STORAGE

AND

COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

March 30, 2021

Docket No. 2015-0389

Appendix I – Grid Needs Assessment



**Maui
Electric**

This Appendix provides the definitions for the grid services considered in the CBRE RFPs and charts for the grid needs and marginal avoided cost values. The grid services were defined as part of the Integrated Grid Planning (“IGP”) Solution Evaluation & Optimization Working Group (“SEOWG”) activities. Bidders may use the information provided in this appendix to understand the grid needs in order to structure their proposals to provide the most value to the Companies.

Grid Service Definitions

The following grid services are used to identify the grid needs.

Table 1: Grid Service Definitions

Grid Service	Definition
Energy	A continuous, controllable, and predictable supply of megawatt-hours to serve system load needs in response to Company Dispatch. ¹
Regulating Reserves	A reserve capacity provided by generating and load resources to allow continuous energy balance over the next 1 minute and 20 to 30-minute time interval due to the variability in renewable resources and load that can be called upon in response to Company Dispatch

¹ “Company Dispatch” as defined in the PPA and SFC means Company's right, through supervisory equipment or otherwise, to direct or control both the capacity and the energy output of the Facility from its minimum output rating to its maximum output rating consistent with this Agreement (including, without limitation, Good Engineering and Operating Practices and the requirements set forth in Section 3 (Performance Standards) of Attachment B (Facility Owned by Subscriber Organization to this Agreement), which dispatch shall include real power, reactive power, voltage, frequency, the determination to cycle a unit off-line or to restart a unit, the droop control setting, the ramp rate setting, and other characteristics of such electric energy output whose parameters are normally controlled or accounted for in a utility dispatching system.

Grid Needs

The charts below describe the seasonal and annual hourly need for the services described in Table 1.

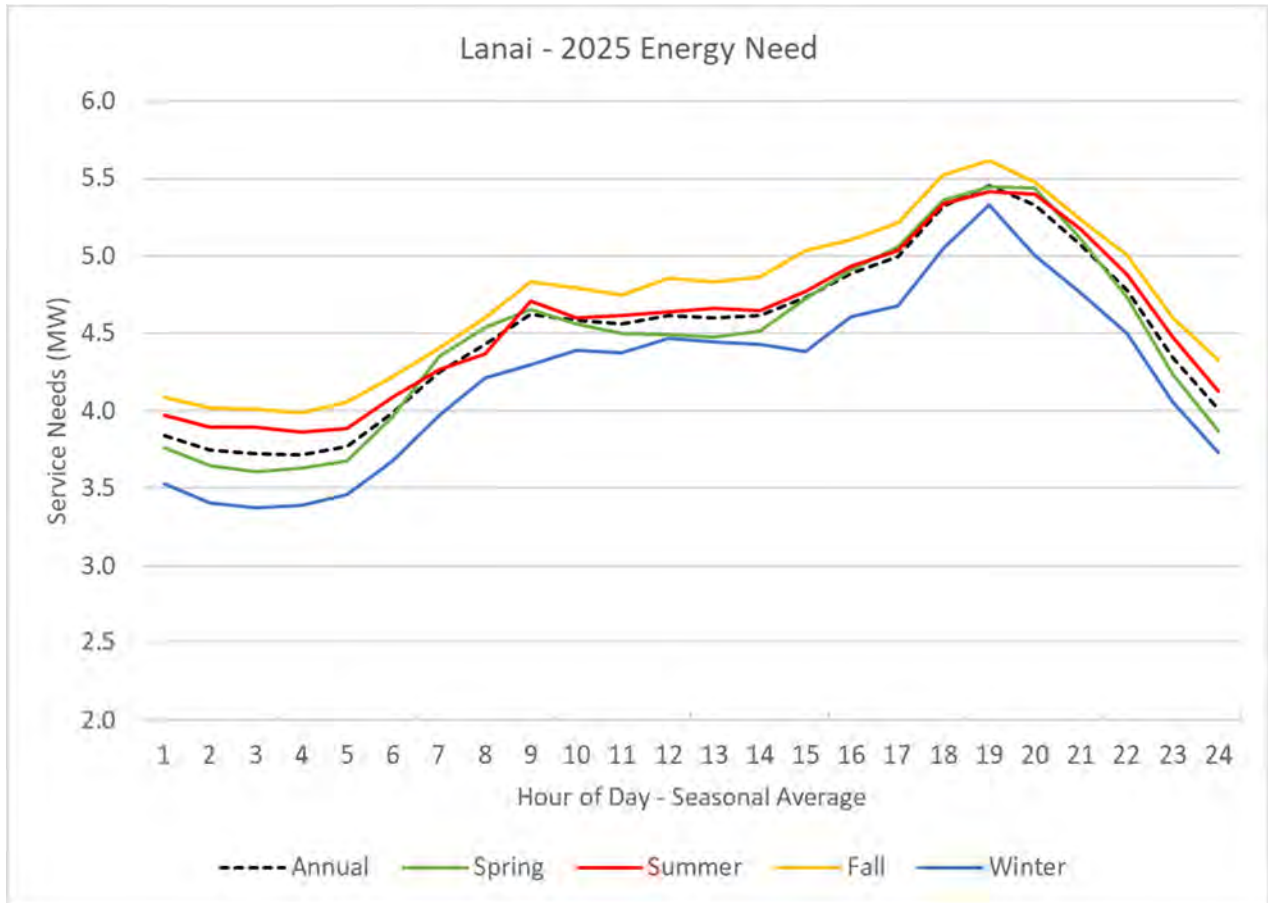


Figure 1: Lana'i 2025 Need for Energy

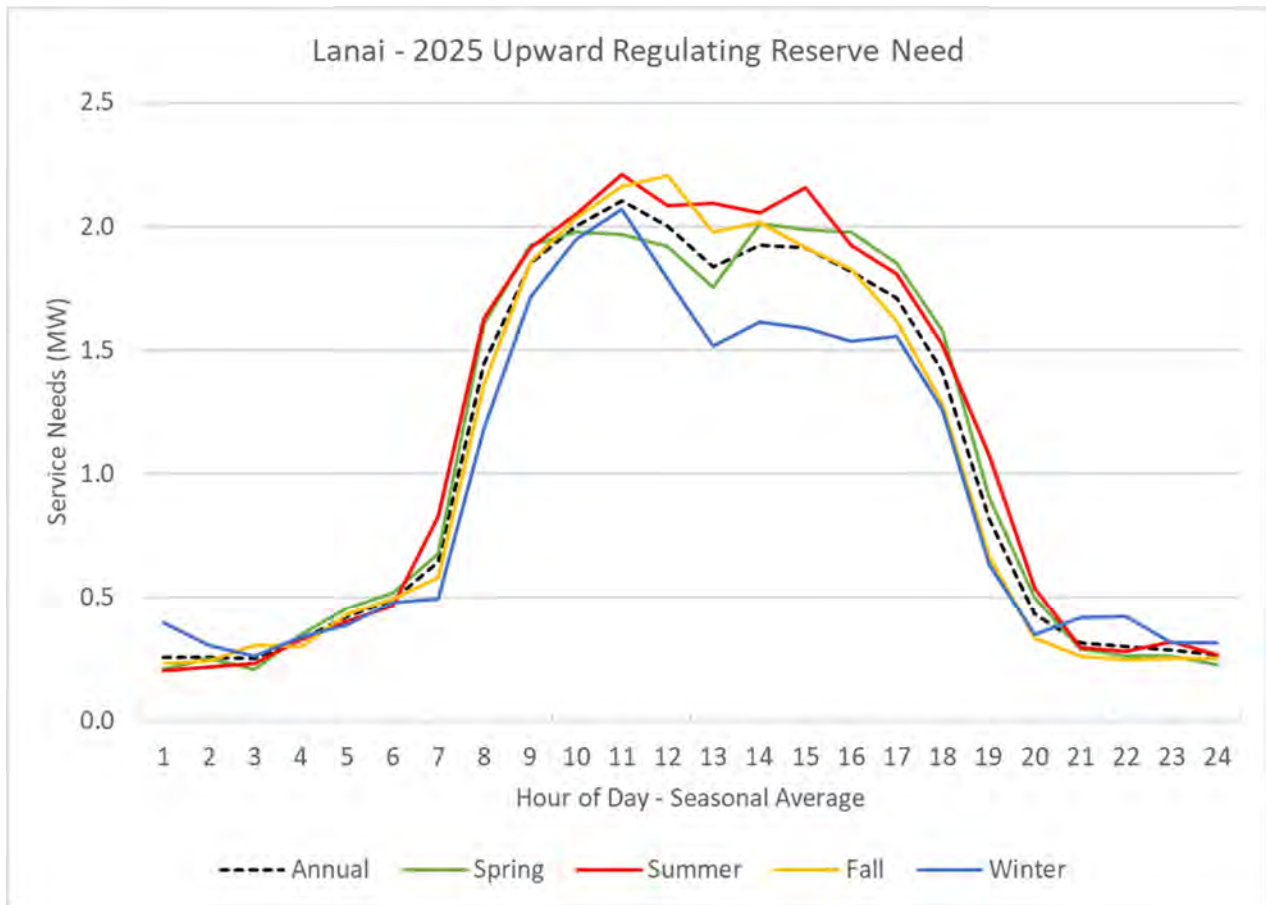


Figure 2: Lana'i 2025 Need for Upward Regulating Reserve

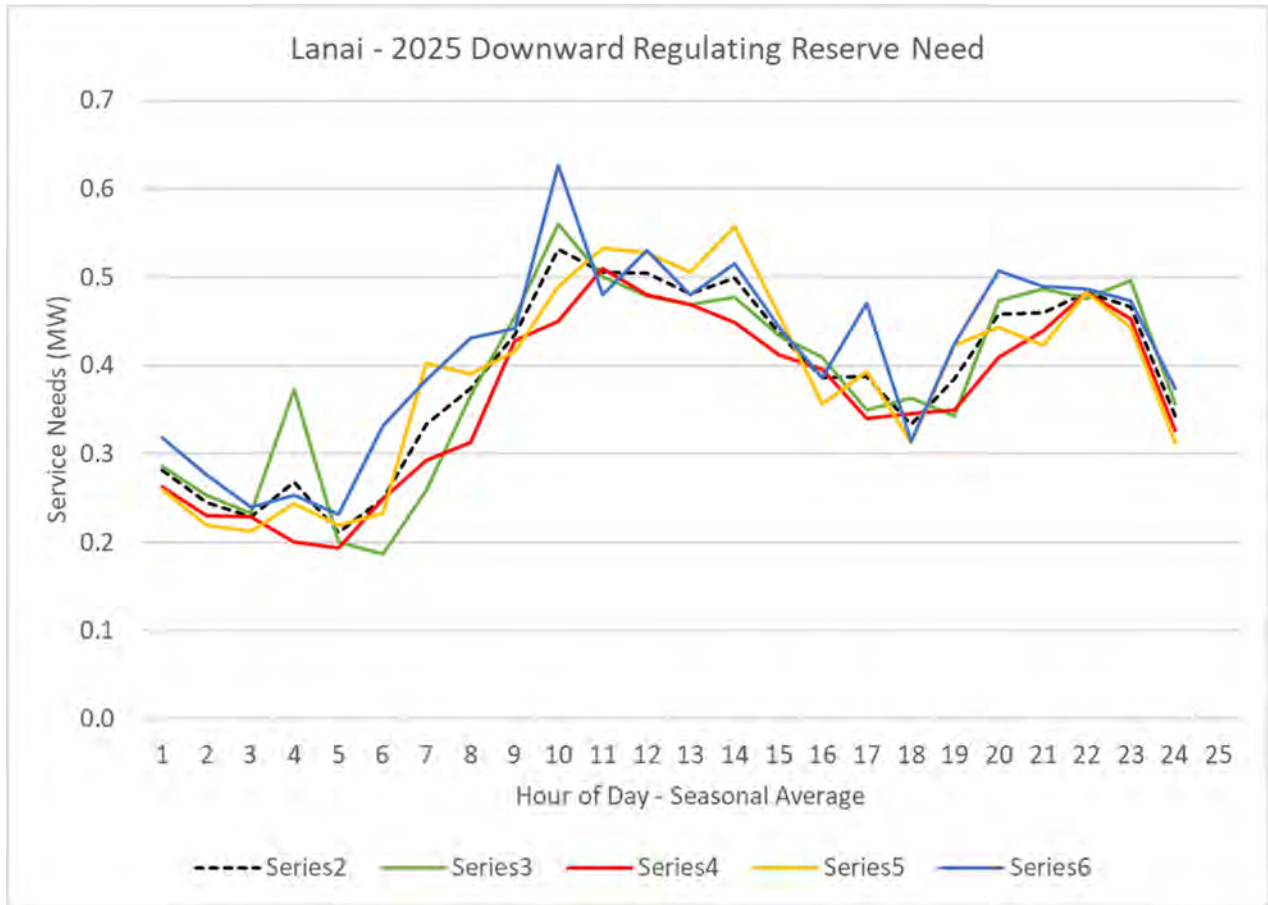


Figure 3: Lana'i 2025 Need for Downward Regulating Reserve

Grid Service Values

The charts below provide the relative marginal avoided costs for the grid services provided in Table 1.

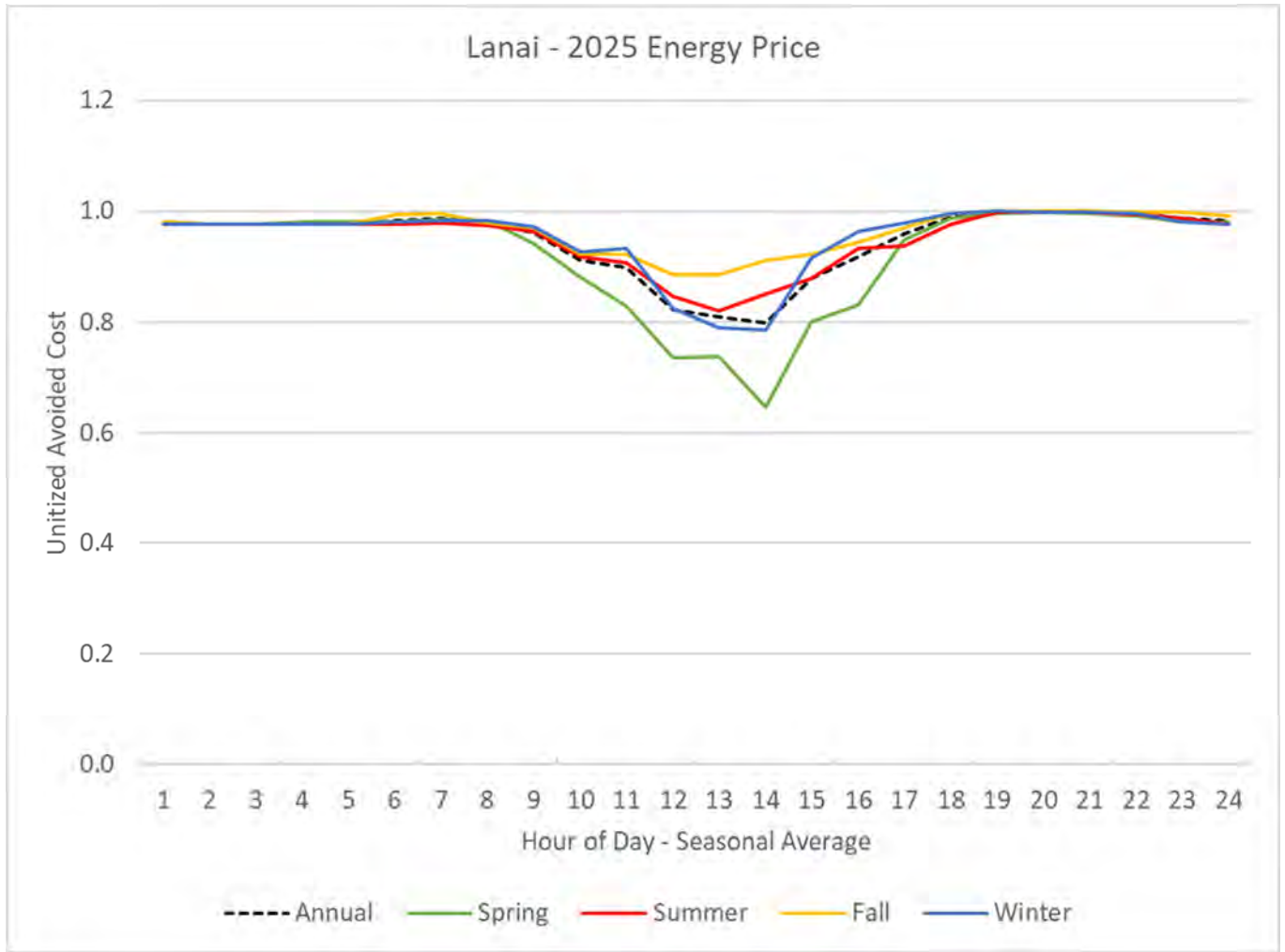


Figure 4: Lana'i 2025 Price for Energy

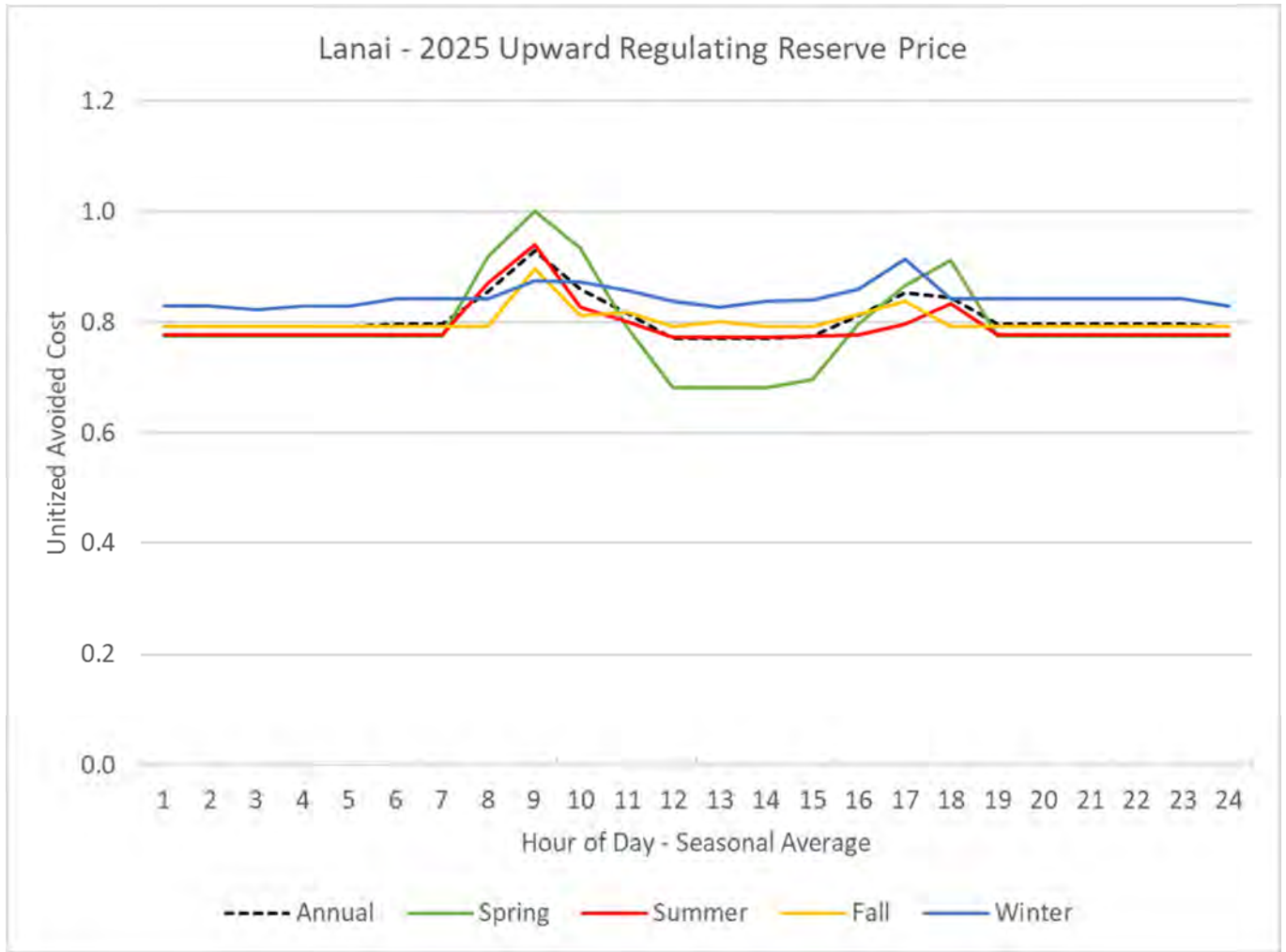


Figure 5: Lana'i 2025 Price for Upward Regulating Reserve

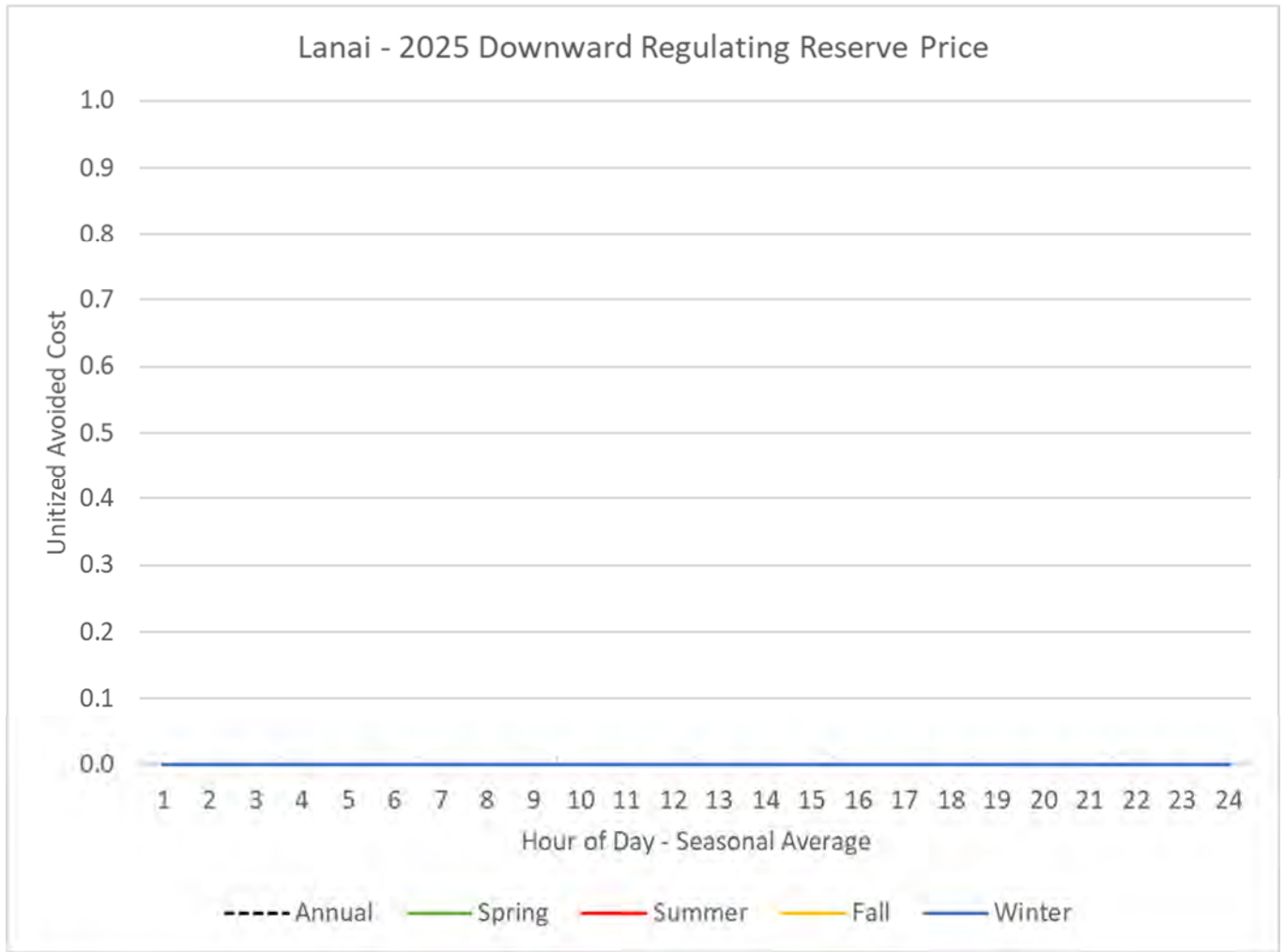


Figure 6: Lana'i 2025 Price for Downward Regulating Reserve

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Appendix J – Rule 29 Tariff

[NOTE: Please refer to Exhibit 4 of the March 30, 2021 filing for the proposed Maui Electric Rule No. 29 CBRE Phase 2.]



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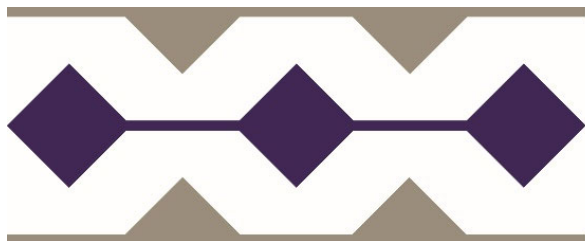
AND COMMUNITY-BASED RENEWABLE ENERGY

ISLAND OF LĀNA‘I

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Appendix K – Lāna‘i Community Comments



**Maui
Electric**

Lānaʻi Community Meeting Feedback (written comments received by Maui Electric Co., Ltd.)

On July 23, 2019, the Company held a community meeting on Lānaʻi to provide residents information on its plans to conduct a Request for Proposals (“RFP”) for Variable Renewable Dispatchable Generation. During the meeting, the Company gave a presentation to explain the objective of the RFP and overall process.¹ Approximately 40 residents attended the meeting. The Company solicited written feedback from the Lānaʻi community based on the following question:

1: Do you have any feedback/comments you want developers to be aware of?

The following written responses were received:

Comment 1:

Suggest bidders be strongly encouraged to meet w public before submitting bid for consideration to better inform public engagement process if selected~

Comment 2:

Please pronounce the name of our island correct Lānaʻi.

Comment 3:

Price and reliability are major considerations.

What are the plans for restoring power should there be failures, e.g., spare parts readily available on island, technicians on island or can be on island quickly.

Comment 4:

Is the location of the new solar going to take away hunting designated land.

Tell the PUC to bring back net metering?

Can the grid handle the increase in power?

Comment 5:

Is it possible to hire/train Lānaʻi residents to fill these new jobs please?

Will you consider including students at Lānaʻi High & Elem if they would like to learn more about renewable energy?

Comment 6:

So glad MECO incorporated significant opportunities for lots of community input.

¹ The July 23, 2019 meeting was held in conjunction with the scope and Section 3.11 Project Site specified in the Variable Renewable Dispatchable Generation RFP issued on November 27, 2019.

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Appendix L – Lāna‘i RDG PPA (PV + Storage only)

[NOTE: Please refer to Draft Model Power Purchase Agreement for Renewable Dispatchable Generation (PV+BESS) with CBRE Component Island of Lāna‘i, Exhibit 11 of the March 30, 2021 filing]



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REQUEST FOR PROPOSALS

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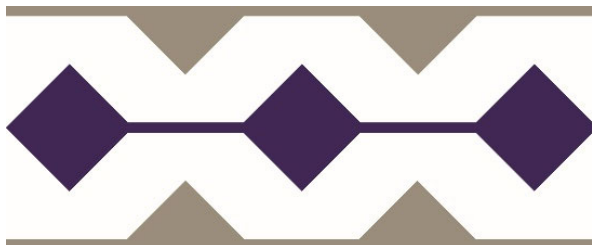
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*Appendix M – Term Sheet for Large CBRE DC
Coupled Projects (PV+BESS)*

**[NOTE: Please refer to Exhibit 12 of the March 30, 2021 filing for the Draft
Term Sheet for Large CBRE DC Coupled Projects (PV+BESS).]**



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