



**Hawaiian  
Electric**

# North Kohala Microgrid RFP

## Hawai'i Island

Technical Status Conference

September 30, 2021



# Purpose and Objective

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- ◆ Brief stakeholders on the North Kohala Energy Storage RFP effort



# Agenda

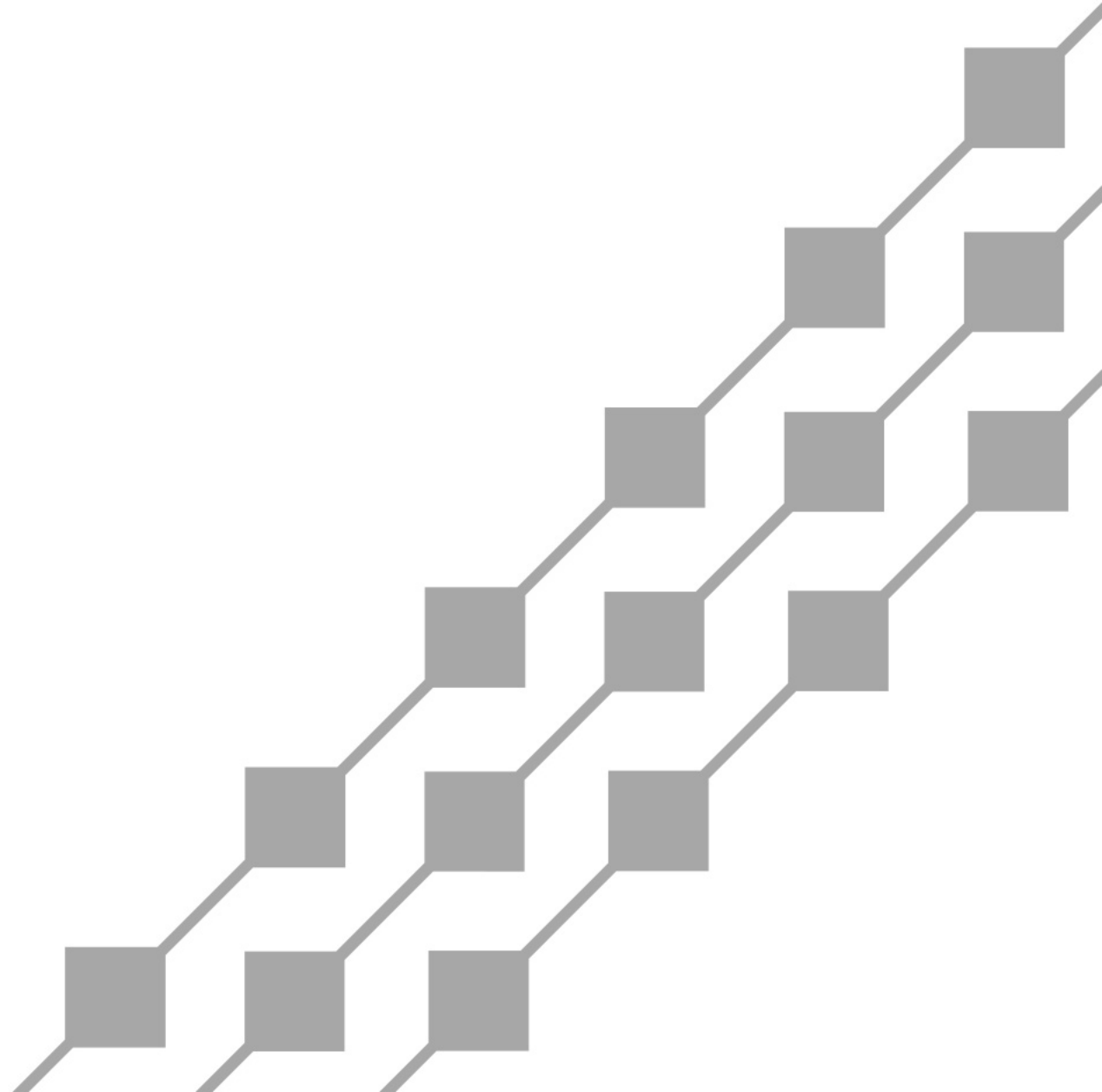
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- ◆ Background
- ◆ RFP Process
- ◆ RFP Requirements
- ◆ Technical Requirements
- ◆ Next Steps
- ◆ Questions



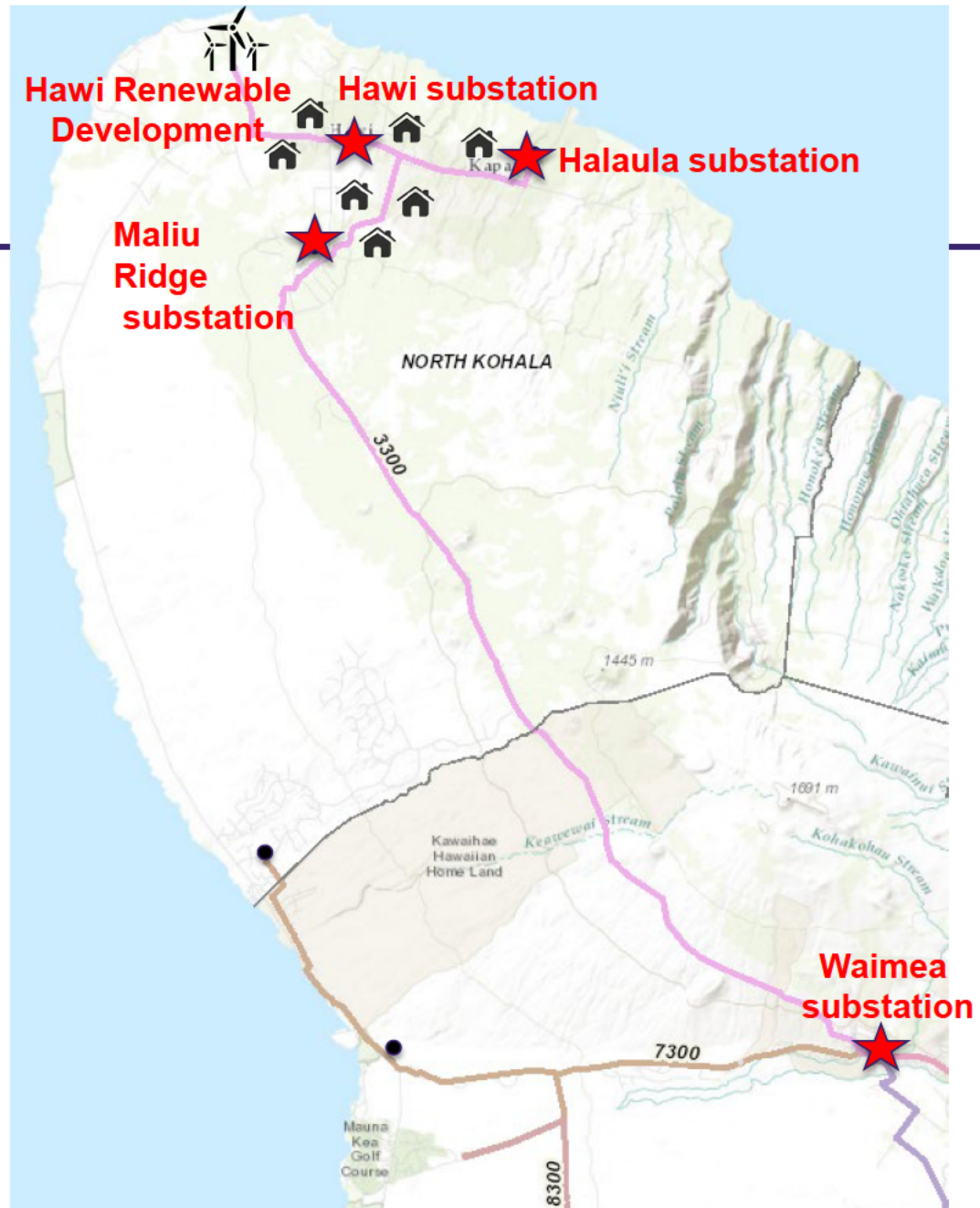
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## Background



# North Kohala

- ◆ Customers serviced through the 3300 Line built in 1950s
- ◆ ~24 miles between Waimea and Halaula/Hawi
- ◆ ~2,000 customers
- ◆ ~4MW peak load
- ◆ 10.5MW windfarm
- ◆ ~2.1MW DER
- ◆ Line capacity 13MVA
- ◆ Transformer capacity 10MW



# Objectives

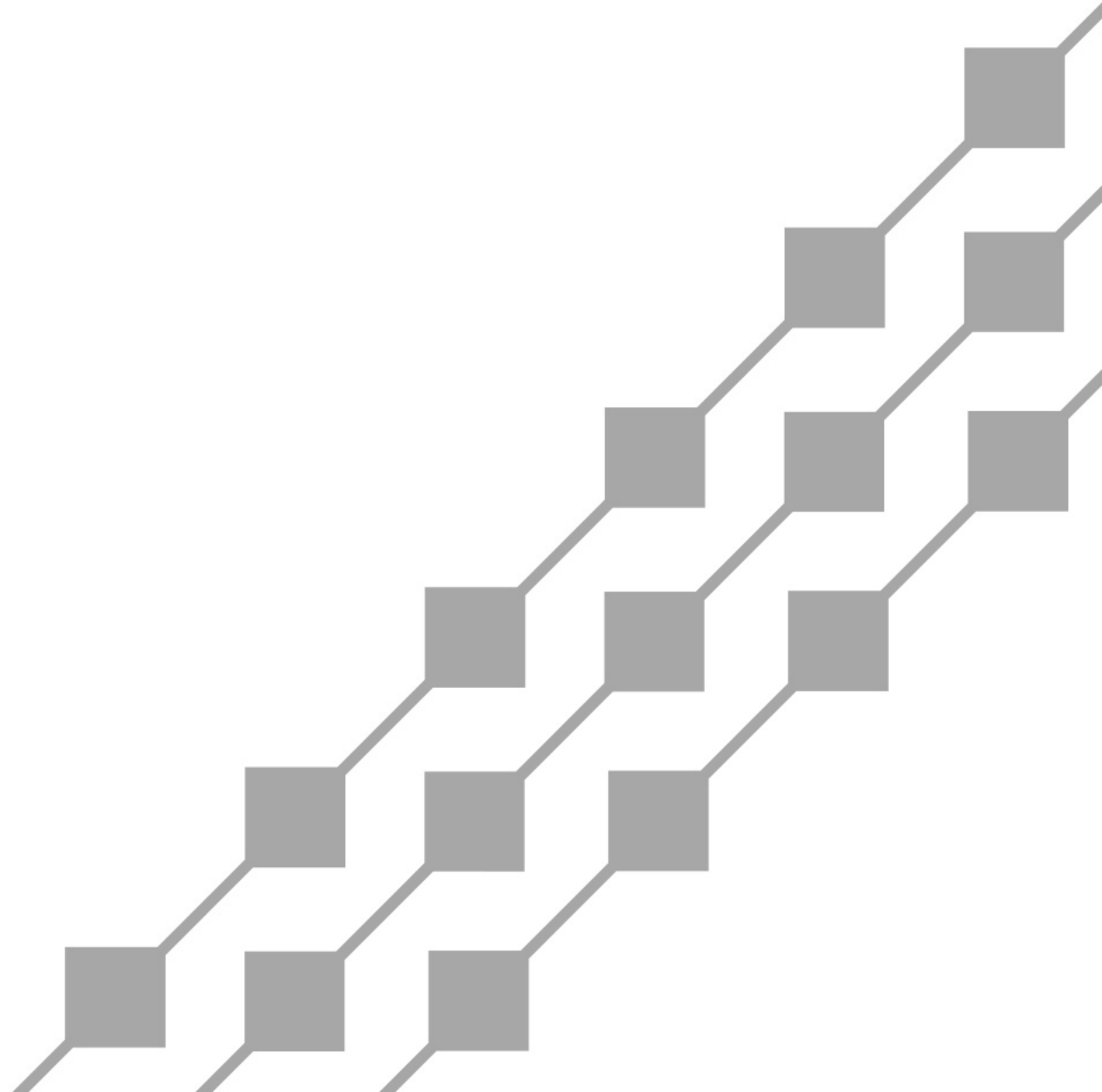
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- ◆ To improve reliability and resilience for customers in North Kohala by providing energy when 3300 Line is out
  - 3300 Line Rebuild Needed (requires outage)
- ◆ Procurement Approach
  - Company-owned and operated microgrid controller (GO7 Application)
  - Third party-owned BESS (RFP)

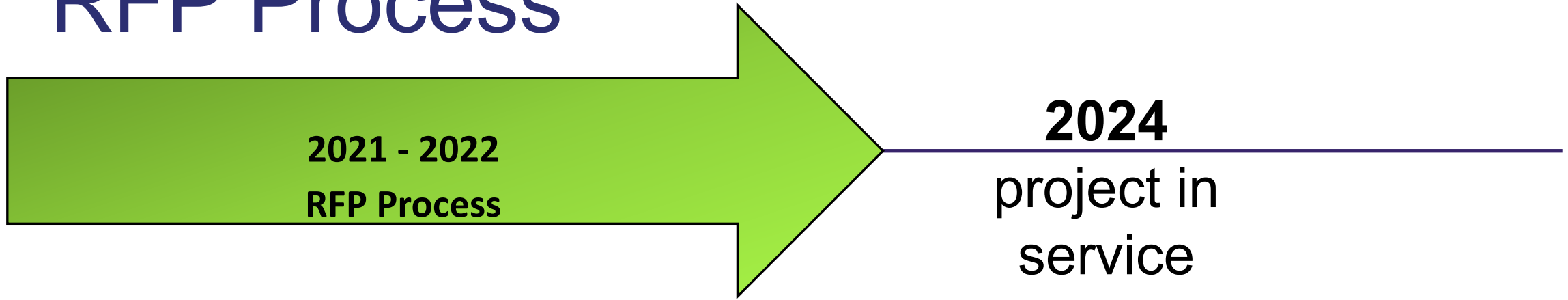


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## RFP Process

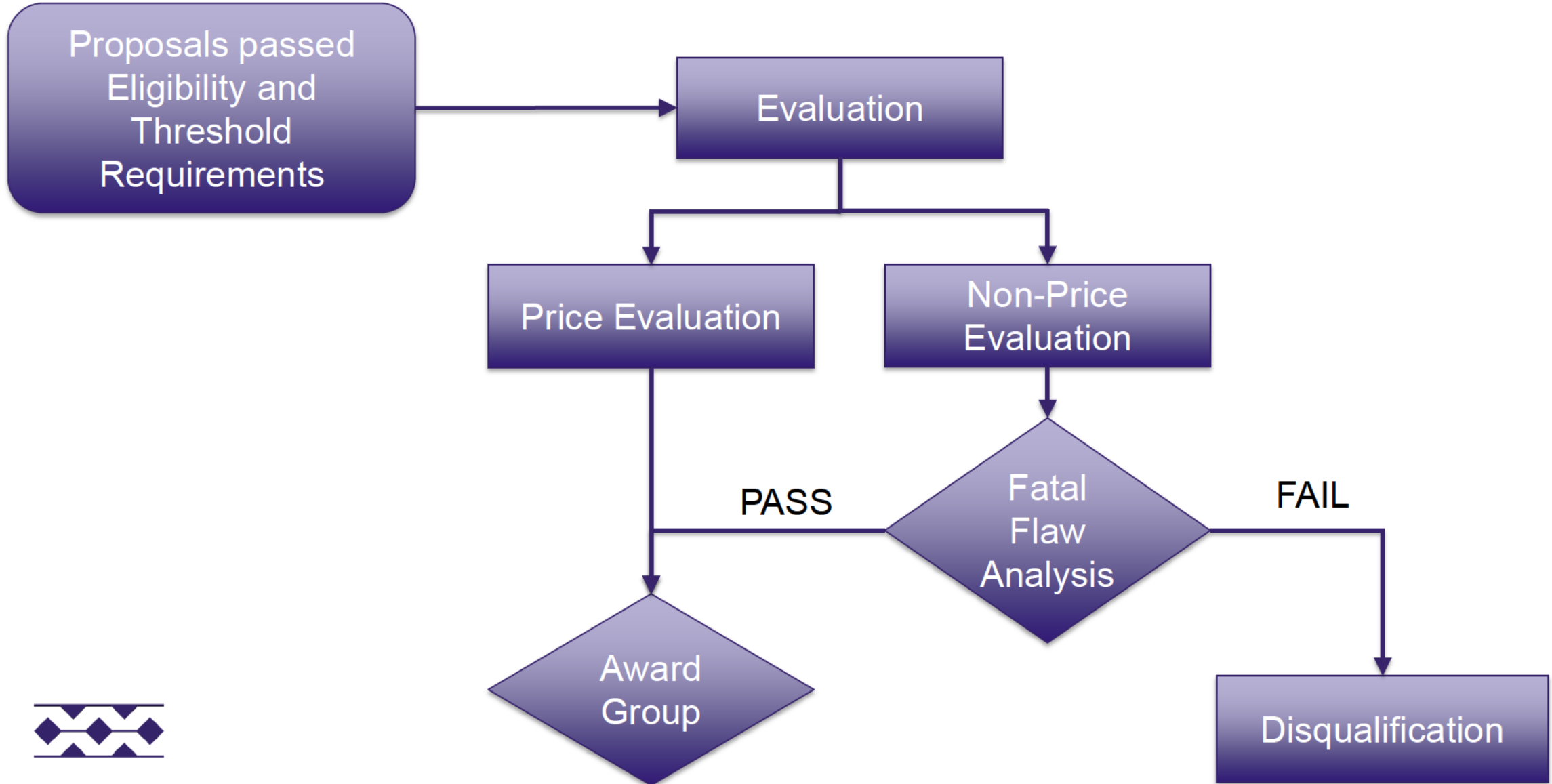


# RFP Process





# Evaluation Process



# Evaluation Process – Non-Price and Price Criteria

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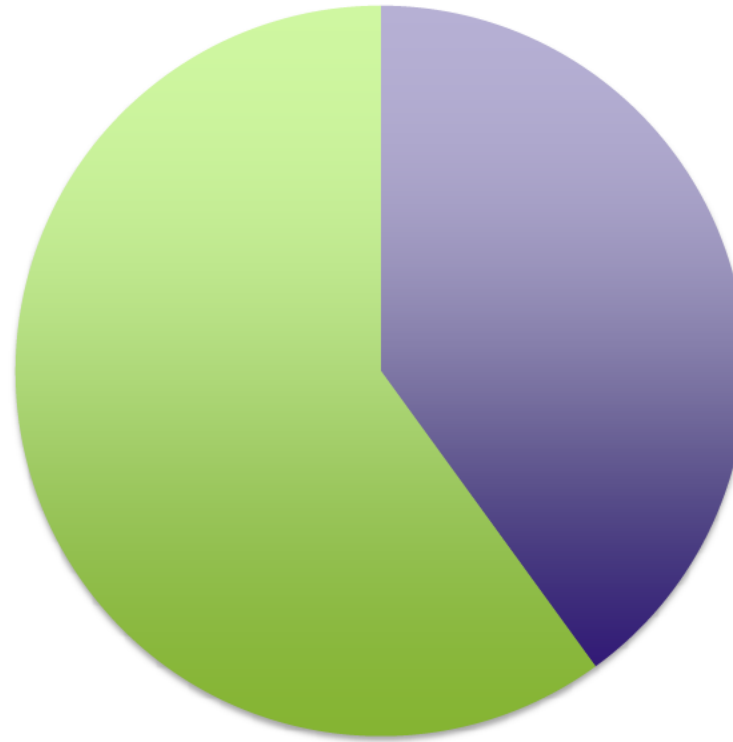
## Total Score

### Non-Price Score (60%)

- 6 criteria total
- Fatal Flaw Analysis
  - Must pass at least 2

### Price Score (40%)

- Based on bid price



■ Price ■ Non-Price



## 6 Non-Price Criteria (60%)

Double Weighted	Single Weighted
State of Project Development and Schedule	Environmental Compliance and Permitting Plan
Performance Standards	Experience and Qualifications
	Financial Strength and Financing Plan
	ESSA Contract Proposed Modifications



# Steps to Issuance of RFP

Sep 23, 2021

- Draft RFP provided to Stakeholders

Sep 30, 2021

- Technical Conference

Oct 7, 2021

- Comments from Stakeholders

Oct 14, 2021

- Comments from PUC

Nov 5, 2021

- File 2<sup>nd</sup> Draft of RFP w/ PUC

Dec 5, 2022\*

- PUC Approval of Final RFP

Jan 6, 2022\*

- Issue RFP to Public for Bids



\*These steps are subject to further decision by the PUC

# Alternate Schedule to Issuance of RFP

Sep 23, 2021

- Draft RFP provided to Stakeholders

Sep 30, 2021

- Technical Conference

Oct 7, 2021

- Comments from Stakeholders

Oct 29, 2021

- File 2<sup>nd</sup> Draft of RFP with PUC

Nov 29, 2021\*

- PUC Comments on Draft RFP

Dec 20, 2021\*

- Final Draft RFP Filed

Jan 20, 2022\*

- PUC Approval of Final RFP

Feb 3, 2022\*

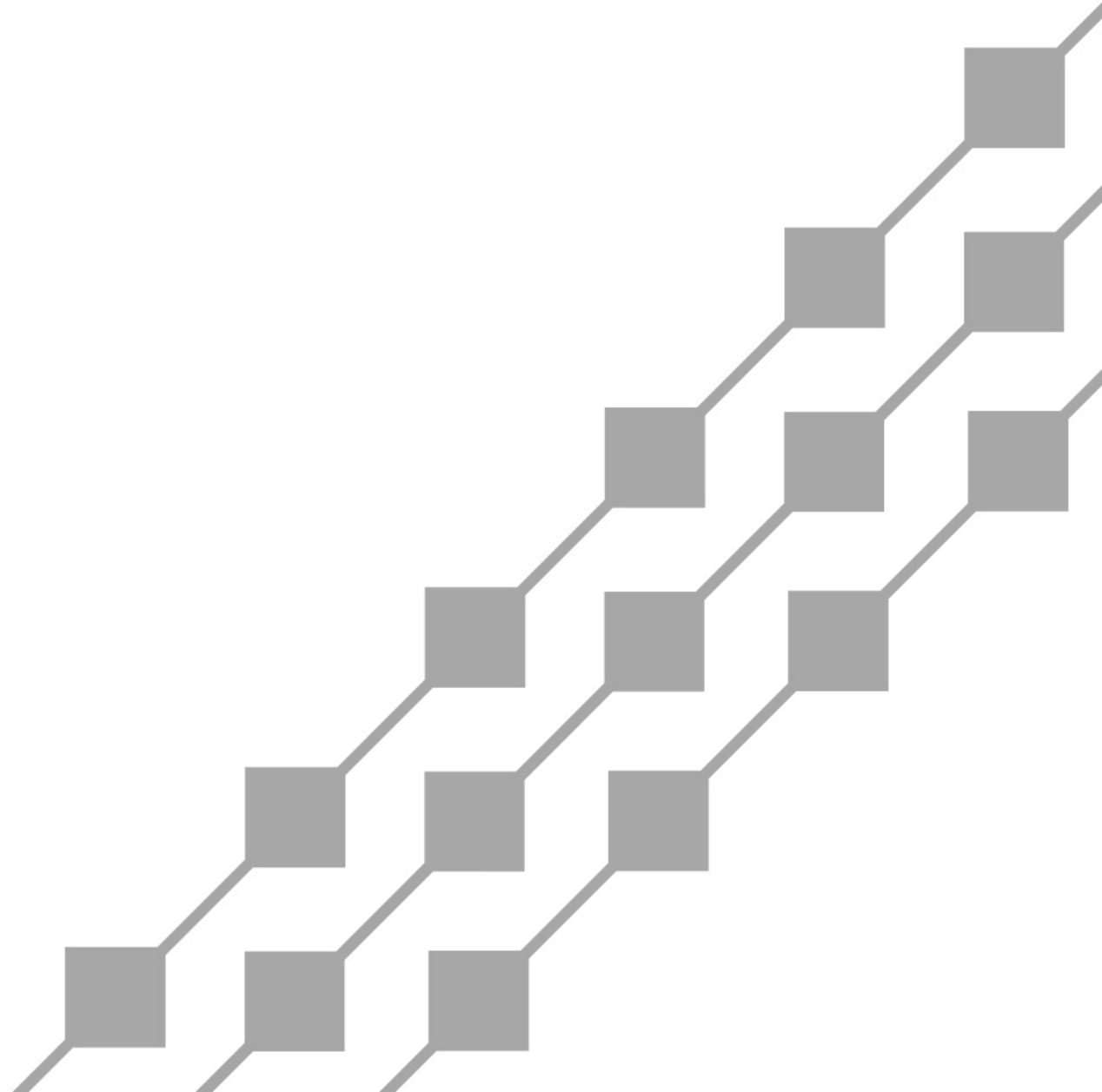
- Issue RFP to Public for Bids



\*These steps are subject to further decision by the PUC

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## RFP Requirements



## North Kohala RFP Requirements

<b>Framework for Competitive Bidding</b>	<ul style="list-style-type: none"><li>• Independent Observer</li><li>• Allows for Hawaiian Electric and Affiliate Proposals</li></ul>
<b>Proposal Fee</b>	<ul style="list-style-type: none"><li>• \$5,000.00</li></ul>
<b>Target</b>	<ul style="list-style-type: none"><li>• 5 MW / 22MWh BESS</li></ul>
<b>GCOD</b>	<ul style="list-style-type: none"><li>• November 22, 2024</li></ul>
<b># Projects Sought</b>	<ul style="list-style-type: none"><li>• One Project only</li></ul>
<b>Contract</b>	<ul style="list-style-type: none"><li>• Energy Storage Services Agreement</li></ul>
<b>Site</b>	<ul style="list-style-type: none"><li>• Company-controlled, Akoni Pule Site</li></ul>



## North Kohala RFP Requirements

<b>Price Eligibility Requirement</b>	<ul style="list-style-type: none"><li>• Combined with estimated cost of Company's microgrid project</li><li>• Must be lower than the estimated cost of a traditional second wires path solution</li></ul>
<b>Akoni Pule Site</b>	<ul style="list-style-type: none"><li>• 1.207 acres</li><li>• Adjacent to Hawi Substation</li></ul>
<b>Interconnection</b>	<ul style="list-style-type: none"><li>• 34.5 kV level at the Akoni Pule Site</li></ul>
<b>Interconnection Responsibilities</b>	<ul style="list-style-type: none"><li>• Seller = SOIF costs and construction</li><li>• Company = COIF costs and construction</li></ul>





## North Kohala RFP Requirements

### Community Outreach and Engagement & Cultural Resource Impacts

- Company will lead efforts
- Selected Proposer required to fully cooperate with and assist Company

### Greenhouse Gas Emissions Analysis

- Selected Proposer responsible for cost



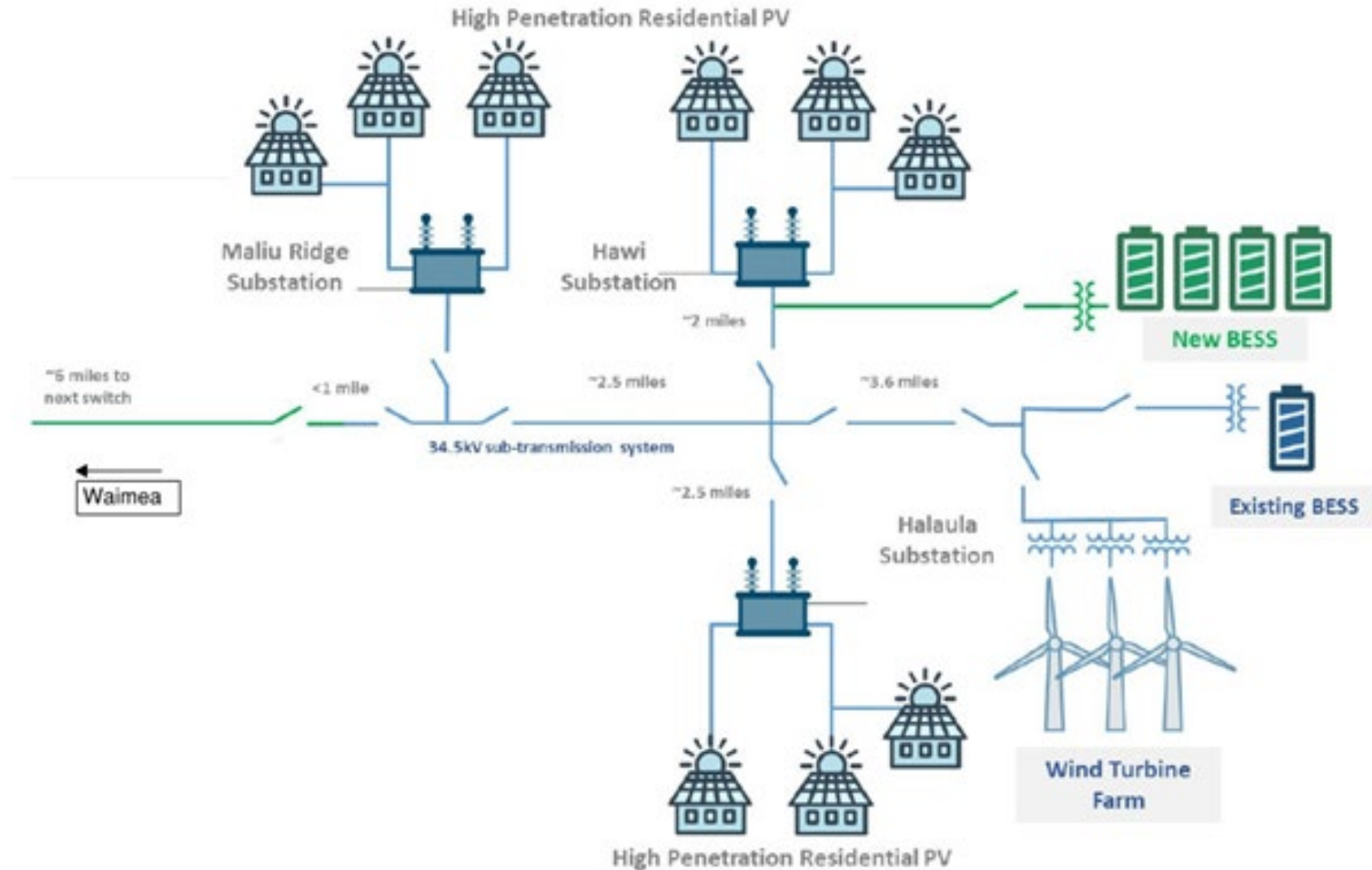
# Technical Requirements



# Microgrid Solution

## System Layout

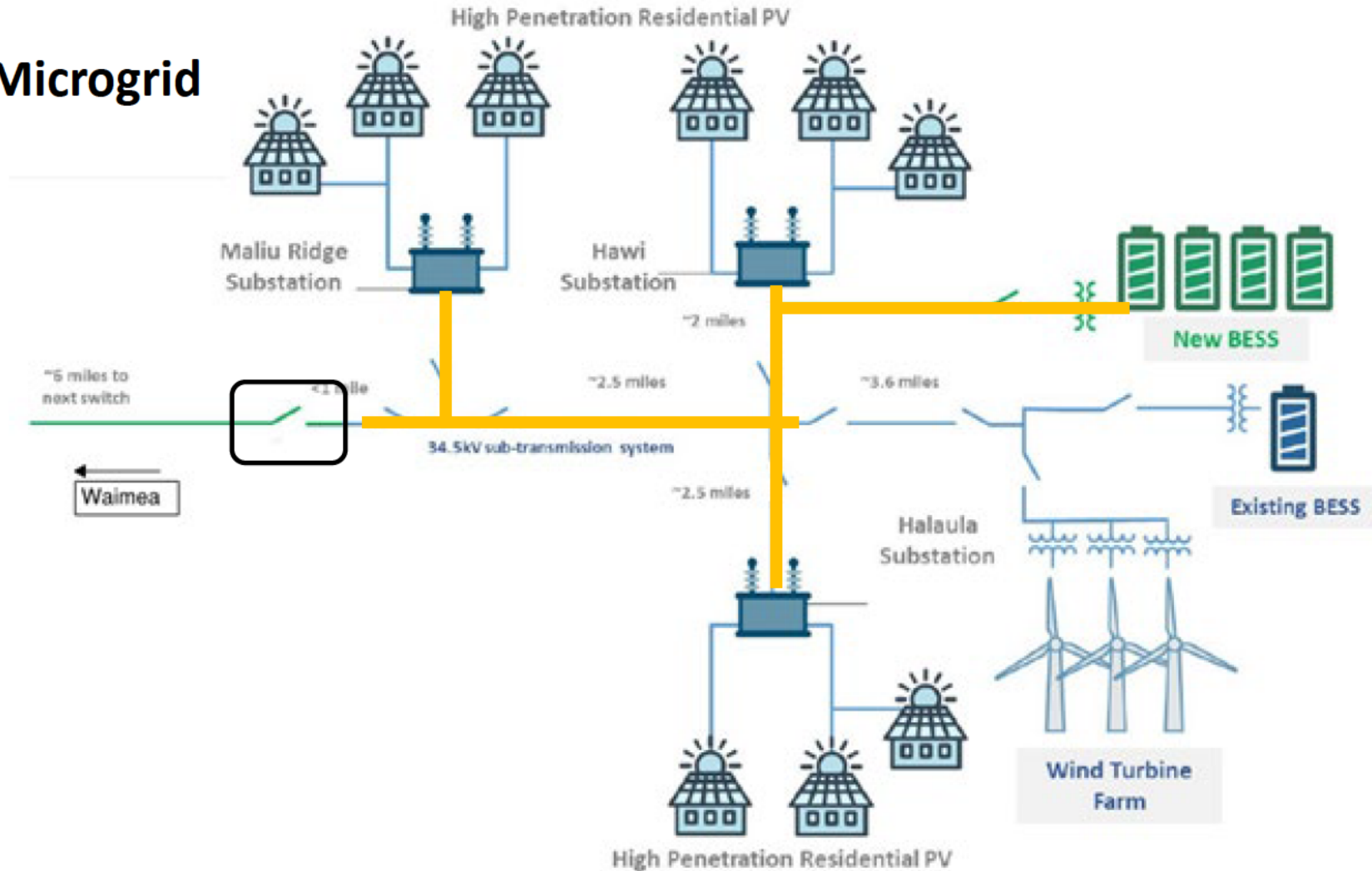
- Maliu Ridge
- Halaula
- Hawi



# Microgrid Solution

## Configuration 1: North Kohala Microgrid

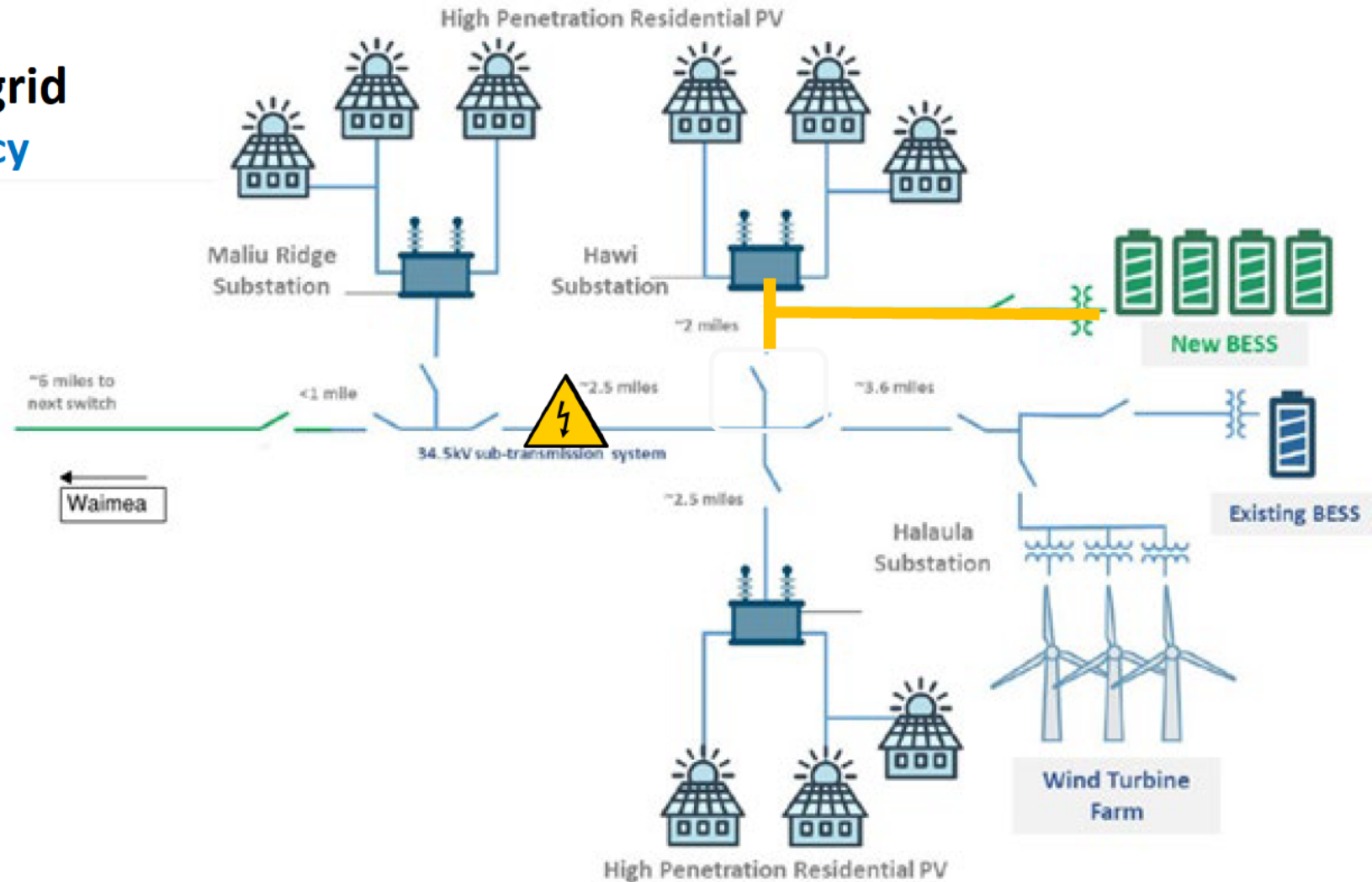
- Maliu Ridge
- Halaula
- Hawi



# Microgrid Solution

## Configuration 2: Hawi Microgrid Manual Operation as Contingency

- Maliu Ridge
- Halaula
- **Hawi**



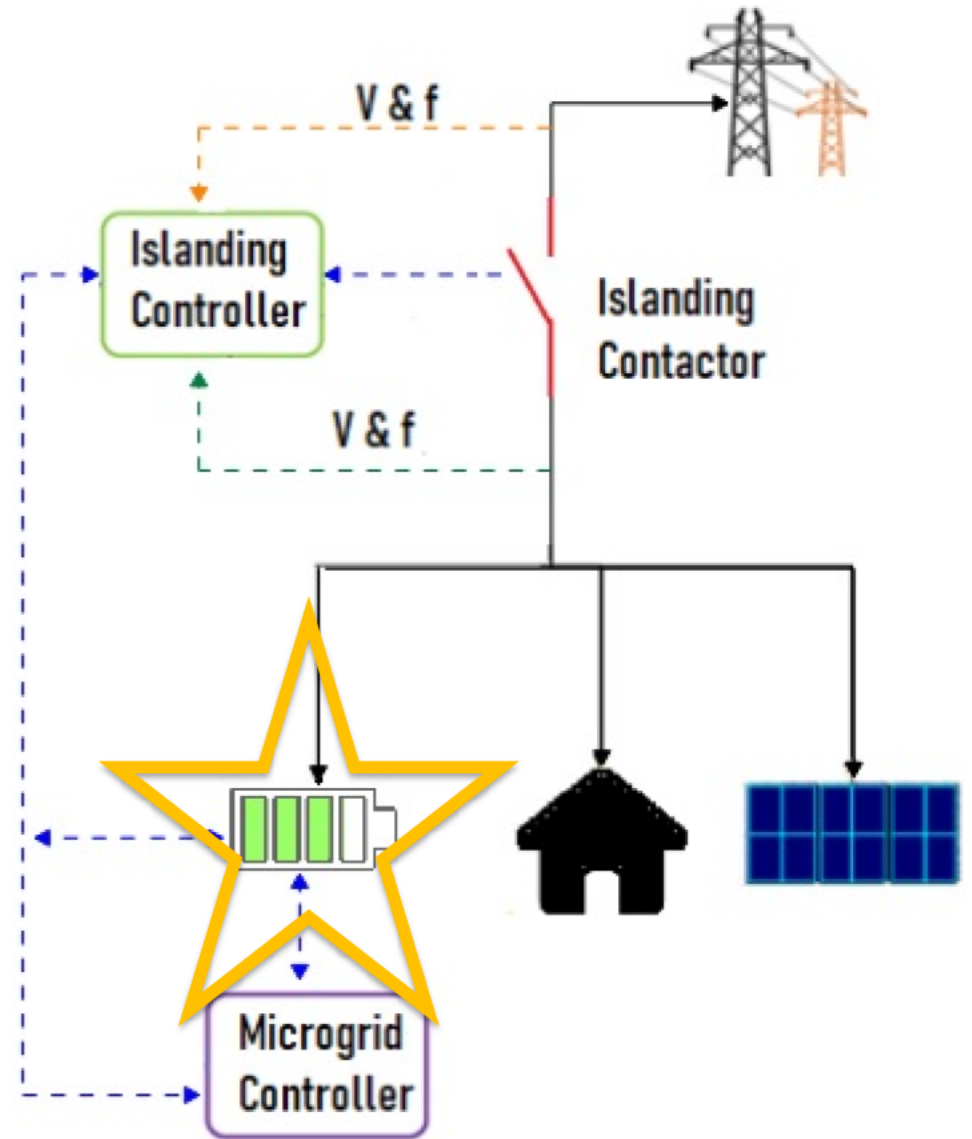
# Microgrid Solution

## Main Component being procured in this RFP

- Microgrid Resource BESS,
- BESS Power Converters,
- BESS Plant level controller, and
- Equipment to interconnect at 34kV

## Main Components not being procured through this RFP

- Islanding Controller
- Microgrid Controller
- 34kV interconnection equipment beyond the point of interconnection
  - Islanding Contactor



# Microgrid Resource Technical Requirements

- **Draft RFP, including but not limited to**
  - **RFP Body**
  - **Draft Appendix H (SLD and SLD Notes), and**
  - **Future draft Appendix O (Functional Requirements)**
  - **Draft Appendix L (ESSA), including but not limited to:**
    - **Appendix A of the ESSA,**
    - **Appendix B of the ESSA,**
    - **Appendix S of the ESSA,**
    - **Appendix T of the ESSA, and**
    - **Appendix U of the ESSA**
- **How the RFP technical requirements translate into ESSA requirements**



# BESS “Services” Identified in RFP, and defined in ESSA

- **Back-up Power,**
- **Rated Energy Capacity,**
- **Frequency Regulation,**
- **Rated Active Power Capacity,**
- **Voltage Regulation,**
- **Black-Start,**
- **Grid-Forming Inverter Control mode, and**
- **Any other uses the Project is capable of providing that would benefit the Company’s distribution or transmission system when not islanding**





## BESS “Services” Identified in RFP, and defined in ESSA

<b>Back-up Power</b>	The Facility shall have the capability to supply power to maintain service continuity and grid resilience to the microgrid islanded area in the event of a planned grid connection outage, at the direction of Company without any observable power quality issues or momentary outages. Momentary outages are acceptable for unplanned grid connection outages, prior to the BESS Black Start being initiated.
<b>Rated Energy Capacity</b>	The amount of energy that the Facility is capable of discharging in megawatt-hours (MWh), measured between the maximum and minimum allowable states of charge, and available to the Company; considering all Station Use and any equipment limits. The Rated Energy Capacity shall not be less than the Contract Capacity. The Rated Energy Capacity of the Facility shall be 22.0 MWh.
<b>Frequency Regulation</b>	The capability to control active power, for the purpose of retaining a target frequency under changing load and generation conditions. Also see Frequency Response and Section 1(g)(xi) (Frequency Response Mode), and Section 1(g)(xii) (Dynamic Active Power – Frequency Performance) of Attachment B of the ESSA.
<b>Rated Active Power Capacity</b>	The total possible instantaneous discharge capability in megawatts (MW AC) of the Facility, available at the POI, or the maximum rate of discharge that the Facility can achieve, starting from a fully charged state, and available to Company; considering all Station Use and any equipment limits. The Rated Active Power Capacity shall not be less than the Contract Capacity (5 MW).



## BESS “Services” Identified in RFP, and defined in ESSA

### Voltage Regulation

The ability to compensate for anomalies or disturbances (e.g., voltage magnitude, harmonics, etc.) to achieve a target voltage at the Point of Interconnection by manipulating the reactive power component of the Facility. Also see Reactive Power requirements in Section 3 of Attachment B of the ESSA of additional details.

### Black-Start

The Facility shall have the capability to self-start, and also energize the islanded transformers and loads in a single breaker closure without outside assistance. Further, inverter-based resources shall ensure they have sufficient energy storage to maintain power injection to the grid during system restoration (i.e., have power available when and if called upon). The capability of the Project to energize transformers and loads is only required within the limits of the Rated Active Power Capacity and Rated Energy Capacity. Seller is responsible for determining the required minimum capacities and appropriate controls of the Facility to facilitate black start energization.

### Grid-Forming Inverter Control

GFM control sets an internal voltage waveform reference such that and inverter with the GFM control shall be able to synchronize with the grid and regulate active and reactive power generation appropriately, regardless of the grid’s strength, or operate independently of other generation. An inverter with GFM control shall immediately respond to grid disturbances to support stability of the grid and maintain its own control stability during the system disturbance.



# ESSA Performance Levels and LDs

- **Performance Level Rated Energy Capacity – Ensures Rated Energy Capacity is met and imposes LD if not met:**
  - $(100\% - \text{Capacity Ratio}) \times \text{Lump Sum Payment for the Measurement Period in question}$
  - Quarterly Evaluation
- **Performance Level Availability – Ensures the BESS is Available to respond when called upon and imposes LD if Measured Availability is less than the Performance Level Availability**
  - $((98\% - \text{Measured Availability}) / 98\%) \times \text{Lump Sum Payment for the calendar month in question}$
  - Monthly Evaluation
- **Performance Level RTE – Ensures the BESS RTE is 85% is met and imposes LD if not met:**
  - For each percentage point by which the RTE Ratio is below the Performance Level RTE, Seller shall pay, and Company shall accept, liquidated damages in an amount equal to two-tenths of one percent (0.0002) of the Lump Sum Payment for the Measurement Period in question.
  - Quarterly Evaluation



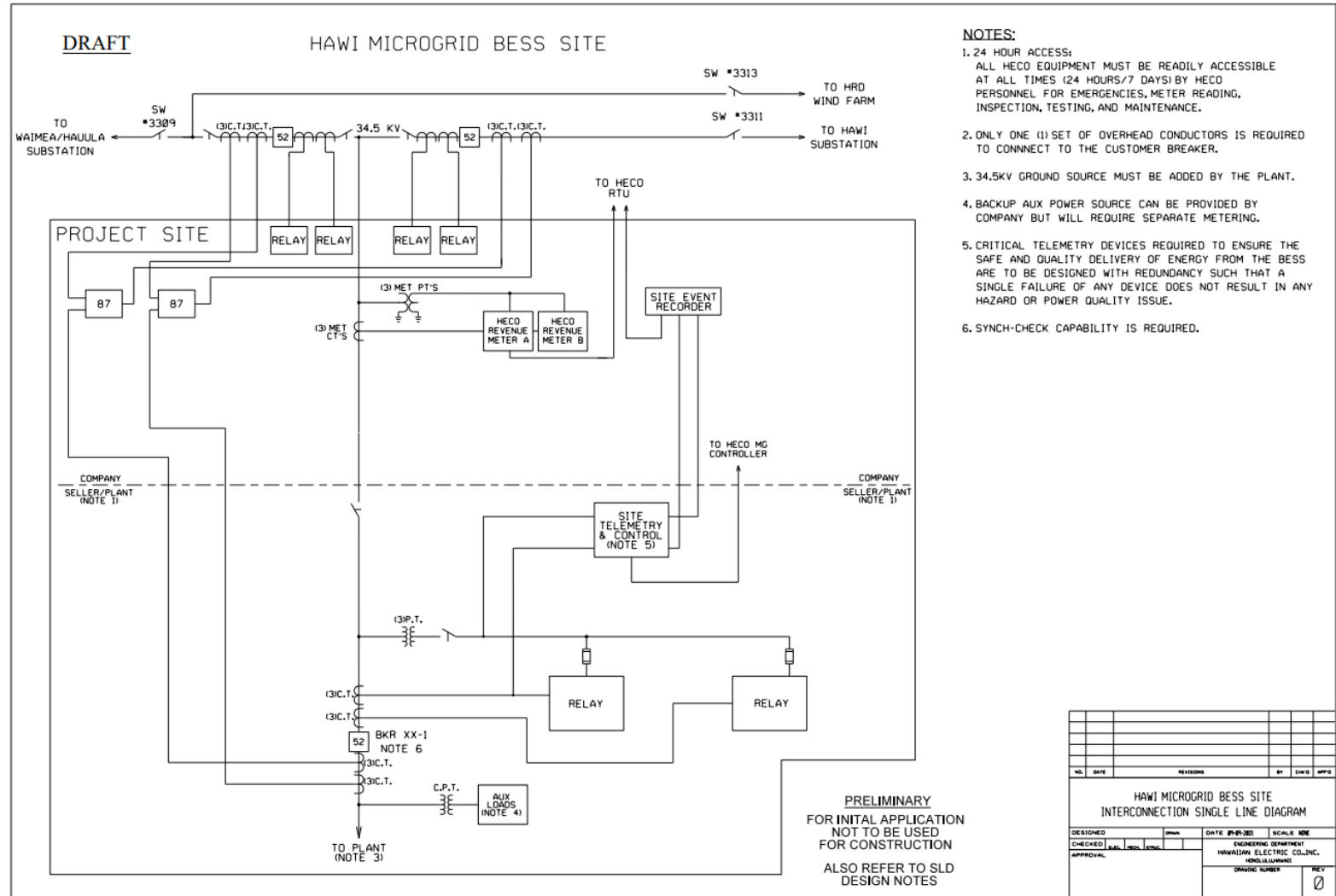
# Modeling Critical to Evaluation, Selection, and Eventual Performance

- Preliminary evaluation of the Transmission System indicates a BESS of the requested size is able to interconnect and support the North Kohala area. The estimated configuration of the interconnection is provided in Appendix H.
- Line data and load transformer datasheets are to be provided to Proposers to simulate a black start of the microgrid system in an electromagnetic transient (“EMT”) environment
- Proposals are required to provide EMT simulation results demonstrating acceptable black start performance of the microgrid using the proposed resource.
- Fault current levels at select busses are provided and Proposals are expected to verify their proposed resource can achieve these fault current levels in modeling.
- A detailed IRS will be required to ensure the Project BESS size, proposed inverter equipment, and controller settings are providing acceptable performance when grid connected, islanding, and during Black Start.
- Additional system mitigation measures in the form of additional equipment is not expected to be required to integrate any specific Project selected through this RFP



# Interconnection Facility Costs

- ◆ Reduce developer uncertainty of interconnection cost by:
  - Identified interconnection site
  - Required interconnection equipment not expected to change as result of IRS and only adjustable settings expected to be advised
  - Most uncertainty in equipment is in the Company scope and requirements can be further refined and competitively procured as part of the complete Microgrid Solution projects



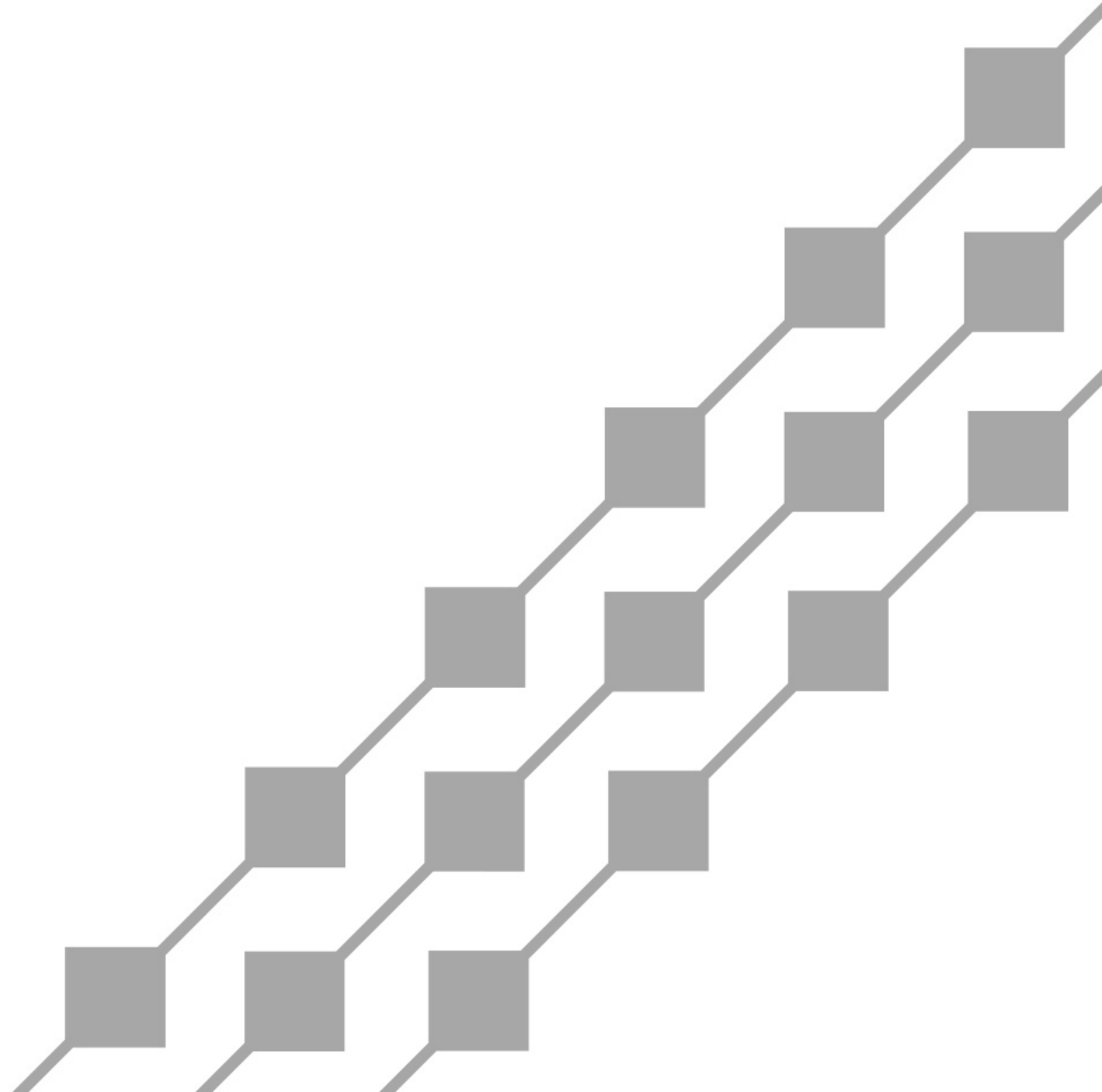
# BESS Testing Considerations

- Preference on operational data providing sufficient proof of Performance Level Satisfaction
  - Difficult to facilitate structured testing in operations
  - Greatest opportunity to test is in the actual operation of the device in its Back-up Power Performance
  - Intended use case will require the BESS sit idle and grid connected for possibly extended periods to be ready to respond to unplanned grid outages.
  - Grid connected operation must be coordinated with wind plant output given existing system capacity restrictions



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## Next Steps



# North Kohala

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- ◆ October 7, 2021 – DRAFT RFP comments due from stakeholders ([renewableacquisition@hawaiianelectric.com](mailto:renewableacquisition@hawaiianelectric.com))
- ◆ October 14, 2021\* – DRAFT RFP comments due from the PUC ([renewableacquisition@hawaiianelectric.com](mailto:renewableacquisition@hawaiianelectric.com))
- ◆ November 5, 2021\* – Updated DRAFT RFP to be filed w/PUC along with request to open docket
- ◆ Stay updated ([www.hawaiianelectric.com/northkohalaenergystoragerfp](http://www.hawaiianelectric.com/northkohalaenergystoragerfp))

\*NOTE: dates change if alternate schedule adopted







Mahalo

Questions?