BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

------- In the Matter of -------	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2014-0183
	)	
Instituting a Proceeding to Review the Power Supply Improvement Plans for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited.	)	

ORDER NO. 33320

ADMITTING INTERVENORS AND PARTICIPANTS, IDENTIFYING OBSERVATIONS AND CONCERNS, SPECIFYING INITIAL STATEMENT OF ISSUES, AND ESTABLISHING SCHEDULE OF PROCEEDINGS

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By this Order, the commission grants intervention and participant status to certain movants; identifies an initial statement of issues and a schedule of proceedings; and makes several preliminary observations regarding the "Power Supply Improvement Plan" ("PSIP") filed by the Hawaiian Electric Company, Inc. ("HECO"), Hawaii Electric Light Company, Inc. ("HELCO"), and Maui Electric Company, Limited ("MECO"), (collectively, the "HECO Companies").[1]

[1]The HECO Companies filed a PSIP for each Company on August 26, 2014.

I.

INTRODUCTION

The commission initiated this docket to consolidate the review of the PSIPs filed for each of the HECO Companies.[2] The ultimate purpose of this proceeding is to determine a reasonable power supply plan for each of the HECO Companies that can serve as a strategic basis and provide context to inform important pending and future resource acquisition and system operation decisions.

At the outset, the commission acknowledges improvements in effort and accomplishments in preparation of the PSIPs. The Companies incorporated more advanced tools in their resource planning analyses and responded to multiple requirements laid out by the commission, which were performed in a limited time frame.

Despite these improvements, the commission has substantial concerns with the initial PSIP filings. As a result of these concerns, the commission makes a preliminary determination, based on initial examination of the PSIPs, supporting exhibits, the Companies' responses to the commission's information requests and comments filed by the public, that the PSIPs for each of the

[2]Order No. 32257 at 1.

HECO Companies are not acceptable without supplementation and amendment.

Several shortcomings need to be addressed, including changes in modeling methods, assumptions and constraints; several aspects of the PSIPs require further analytical support; and several assumptions and objectives need to be updated to reflect recent changes in laws and other circumstances. Initial matters requiring further supplementation and amendment in this proceeding are identified and discussed specifically in Sections VI and VII of this Order. In particular, the commission identifies observations and concerns in eight subject areas:

#1. PSIP Cost Impacts and Risks Have Not Been Demonstrated To Be Reasonable.

The Companies' prominent claim that the PSIPs would result in 20% residential bill reductions is a selectively limited and potentially misleading characterization of the supporting analyses. Closer examination indicates that the PSIP costs and rates would increase for HECO, and would not decrease substantially for MECO and HELCO. The high PSIP costs and rate impacts are concerns that the HECO Companies need to address. Furthermore, it appears that there may be alternative strategies that can deliver more certain and timely benefits to customers.

The commission, in this order, encourages Parties to offer alternatives to the HECO PSIP strategies in this proceeding.

In addition, the commission is concerned that the implicit "deal" in the HECO Companies' Preferred Plans appears to favor the financial interests of the Companies while providing less prominent and less certain benefits for customers. The PSIPs would incur extensive, near-term capital spending with only limited potential for customer savings that would occur later in the planning period than necessary and would be subject to several significant uncertainties.

#2. PSIPs Do Not Appear to Aggressively Seek Lower-Cost, New Utility-Scale Renewable Resources.

It has not been clearly demonstrated that the proposed renewable energy portfolios in the "Preferred Plans" represent a reasonable, cost-effective strategy to meet state energy policy objectives. The HECO Companies appear to have included resources with higher costs and uncertain feasibility at the expense of other lower-cost renewable sources that could be developed sooner and with lower development risk.

#3. PSIPs do not Adequately Address Utilization and Integration of Distributed Energy Resources.

The PSIPs assume little or no role for the promising "smart home" and "smart business" technologies of the future beyond rooftop PV. For instance, the supporting analyses do not appear to consider contributions from all types of distributed resources, including demand response, energy efficiency, electric vehicles, distributed generation, and distributed energy storage, to supply high-value grid services or offset future transmission-and-distribution infrastructure upgrades, to any significant extent. The HECO proposals do anticipate growth in rooftop PV systems but treat these resources as a predetermined "end state rather than an optimized resource," which is problematic given today's substantial and increasing projections for rooftop PV systems.

#4. Proposed Plans for Fossil-Fueled Power Plants are not Sufficiently Justified.

The PSIPs do not convincingly demonstrate that the proposed plans for each island's generation fleet are a preferred or most cost-effective option. In light of substantial uncertainties regarding the cost effectiveness, feasibility and timing of possible availability of LNG fuels, the strategies in the PSIPs to convert existing fossil-fueled generation units to

LNG fuels, followed by retirement of existing units and replacement with new fossil generation units, is not sufficiently justified.

#5. System Security Requirements Appear Costly and Are Not Sufficiently Justified.

The HECO Companies have not demonstrated that the proposed requirements are a reasonable, cost-effective set of requirements to balance system reliability, affordability, and the integration of further renewable energy sources. The technical basis for the proposed system security requirements has not been justified or defined in technology-neutral terms, and the proposed requirements appear to excessively limit utilization of and increase costs to integrate renewable resources.

#6. Proposed Plan for Provision of Ancillary Services Lacks Transparency and May Not be Most Cost-Effective Option.

The HECO Companies have not sufficiently considered the potential of all sources of ancillary services, including the contributions of demand response resources, and have not demonstrated that the proposed selection, sizing, and design of resources are the most cost-effective options to provide ancillary services in the Preferred Plans.

#7. PSIP Analysis on Inter-Island Transmission Lacks Sufficient Detail.

The HECO Companies have not provided reasonable benefit-cost analysis of inter-island transmission options in the PSIPs and have not sufficiently explained why the conclusions in the PSIPs contrast so markedly with prior analyses.

#8. Customer and Implementation Risks Are Not Adequately Addressed.

The PSIPs do not provide adequate consideration or analysis of substantial risks and uncertainties for customers, including the impacts of the timing, availability, and pricing of LNG imports; impacts of improvements in technology and the availability of renewable resources; and potential risks of stranded costs and rate impacts in light of the extensive proposed capital expenditure plans. In addition, implementation risks associated with project management and the ability of the HECO Companies to finance and manage a capital intensive resource expansion program have not been given adequate consideration.

Given this substantial list of concerns, the commission finds it necessary to remind the HECO Companies that as a result of their numerous, repeated failures to properly plan for an

affordable, high-renewable future,[3] the commission has had to take appropriate actions to address the Companies' poor performance. The commission directed the Companies to develop and file PSIPs

[3]See (1) In the Matter of MAUI ELECTRIC COMPANY, LIMITED, For Approval of Rate Increases and Revised Rate Schedules and Rules, Docket No. 2011-0092, "Decision and Order No. 32055" (MECO Rate Case), filed April 28, 2014, at 4-6 and Findings and Conclusions generally; (2) "Final Certification of the HECO/MECO/HELCO Integrated Resource Planning Process: Certification of Key Phases III, IV and V" filed on July 29, 2013 by the Independent Entity in In the Matter of PUBLIC UTILITIES COMMISSION Regarding Integrated Resource Planning, Docket No. 2012-0036 (conclusions not certifying the HECO Companies' IRP Report); (3) "Decision and Order No. 32052," filed on April 28, 2014, in Docket No. 2012-0036 (rejecting the HECO Companies' IRP Report); (4) "Decision and Order No. 32053 Ruling on RSWG Work Product" ("Decision and Order No. 32053") filed on April 28, 2014, in Docket No. 2011-0206; (5) "The Independent Observer's Final Report on Hawaii Electric Light Company's Final Request for Proposals for Renewable Geothermal Dispatchable Energy and Firm Capacity Resources" filed May 19, 2014, in In the Matter PUBLIC UTILITIES COMMISSION Instituting a Proceeding Related to a Competitive Bidding Process for 50 MW of Dispatchable Renewable Geothermal Firm Capacity Generation on the Island of Hawaii, Docket No. 2012-0092, at 2-5; (6) In the Matter of PUBLIC UTILITIES COMMISSION Instituting an Investigation to Reexamine the Existing Decoupling Mechanisms for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, Docket No. 2013-0141, "Order No. 32735 Modifying Decoupling Mechanisms and Establishing Briefing Schedule," filed on March 31, 2015; (7) Letter agreement, dated and filed with the commission February 27, 2015, between the commission Chair and HECO President and CEO (resolving disposition of proposed denial or delays in interconnection of residential PV systems); (8) Order Nos. 32871, 32872, 32873, 32875, 32876, and 32877, "Deferring Decision-Making on the Power Purchase Agreement" filed on June 2, 2015 in Docket Nos. 2014-0308, 2014-0354, 2014-0355, 2014-0357, 2014-0358, and 2014-0359 at 2-21; Letter from commission Director of Enforcement to Sharon Suzuki, dated September 23, 2015, initiating informal investigation into reported Molokai interconnection delays.

because incomplete and improper planning was a fundamental cause for many of these avoidable missteps. Given the state's policy directives to achieve a high renewable future and the significant investments required to reach this goal, the commission believes the development of acceptable PSIPs are critical to continuing progress towards the state's policy goals while maintaining affordable electricity rates. Furthermore, development of acceptable plans is essential to the HECO Companies fulfillment of their role to provide a platform to meet the diverse service requirements of their customers by integrating a variety of generation sources and customer-sited resources in an economically and operationally efficient manner.

Despite the concerns raised in this order, the commission believes the HECO Companies and the Parties in this docket can develop reasonable power supply plans that meet state policy goals at an affordable cost. The schedule of proceedings described herein establishes a process and timeline for the final development and submission of the HECO Companies' PSIPs.

II.

BACKGROUND

The commission initiated an integrated resource planning ("IRP") process for the HECO Companies in 2012. The IRP Reports

filed by the HECO Companies were expected to identify resource action plans to achieve the state's energy goals, integrate substantial amounts of utility-scale and distributed renewable energy resources in a cost-effective manner, while maintaining affordable costs and rate impacts.

The HECO Companies filed their consolidated IRP Report and Action Plans with the commission on June 28, 2013 in Docket No. 2012-0036. After review of the IRP Report and Action Plans and the filings by the HECO Companies, the IRP Independent Entity, Parties and general public in the docket, the commission ultimately rejected the HECO Companies' IRPs as non-compliant and inconsistent with the Framework governing the IRP process.[4]

The Commission opened several parallel proceedings to apply appropriate regulatory oversight over the HECO Companies' operations, activities, and investments. These actions included directing HECO and MECO to each prepare and file a PSIP[5],

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[4]See Decision and Order No. 32052 at 27-31 and 64-69, wherein the Commission found, among other shortcomings, that the IRP analytical approach was fundamentally flawed, relied on inadequate modeling tools and methods, and failed to provide sufficient, meaningful or credible analysis of several crucial issues.

[5]The commission previously directed HELCO to prepare and file a PSIP in In the matter of the APPLICATION FOR APPROVAL OF A POWER PURCHASE AGREEMENT FOR RENEWABLE DISPATCHABLE FIRM ENERGY AND CAPACITY for the Hu Honua bioenergy project, Docket No. 2012-0212, Decision and Order No. 31758, filed December 20, 2013. HELCO filed

and issuing the COMMISSION'S INCLINATIONS ON THE FUTURE OF HAWAII'S ELECTRIC UTILITIES ("Commission's Inclinations").[6]

In the Commission's Inclinations, the commission clearly articulated the importance of affordable electric rates and aggressive pursuit of clean energy objectives as the foundations for the strategic business direction for the HECO Companies.

> Hawaii's electricity customers continue to endure the highest electricity prices in the country, and the high cost of this essential service imposes substantial burdens on Hawaii's households and businesses.
>
> . . .
>
> The Commission views the objectives of lower, more stable electric bills and expanding customer energy options, while maintaining reliable energy service in a rapidly changing system operating environment, as essential principles that are the foundation for the future strategic business direction of the HECO Companies. By extension, these principles are also important criteria in the review and approval of future utility capital investment projects and programs.[7]

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its initial PSIP in response to Decision and Order No. 31758 on April 21, 1014. By letter dated June 4, 2014, HELCO informed the commission of its intention to file an updated PSIP coincident with the filing of HECO and MECO's PSIPs.

[6]The Commission's Inclinations were attached as Exhibit A to Decision and Order No. 32052.

[7]Commission's Inclinations at 2-3.

The Commission's Inclinations also provided guidance on how the HECO Companies could reduce electricity costs and rates. The Commission observed that:

> Hawaii has already entered a new paradigm where the best path to lower electricity costs includes an aggressive pursuit of new clean energy sources. By embracing cost-effective clean energy opportunities that displace today's high-cost oil-fired generation, Hawaii's electric utilities can stabilize and lower customer bills.[8]

The commission also observed that:

> the power supply systems of each utility are becoming more complex and challenging as greater quantities of diverse renewable energy resources are integrated with older, relatively inflexible base load generation resources. These challenges include, but are not limited to: (1) determining the appropriate mix of firm and as available resources; (2) analyzing the continued utilization of traditional base load generation to provide ancillary and other essential grid support services; and (3) resolving competing priorities as to which renewable energy resources will be utilized.[9]

Consistent with the strategies and direction articulated in the Commission's Inclinations, the Commission ordered each of the HECO Companies to prepare a PSIP that was to include appropriate improvement strategies and timely action plans that

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[8]Commission's Inclinations at 2.

[9]See Order No. 32294 at 2-3 (issued in the instant docket).

would reduce power supply costs and customer rates for each electric utility.

> The PSIPs are to include actionable strategies and implementation plans to expeditiously retire older, less-efficient fossil generation, reduce must-run generation, increase generation flexibility, and adopt new technologies such as demand response and energy storage for ancillary services, and institute operational practice changes, as appropriate, to enable integration of a diverse portfolio of additional low cost renewable energy resources, reduction of energy costs and improvements in generation operational efficiencies.[10]

In Order No. 32053, the commission identified several components to be included, at a minimum, in HECO's PSIP:

> a. A **Fossil Generation Retirement Plan** which shall be supported by an analysis of which existing utility fossil fuel generating units (beyond the Honolulu units) can be retired, when it is feasible to retire each such unit, why it is not feasible to retire each such unit sooner, the effect on system operations of retiring each such unit, and the anticipated ratepayer savings that would result.
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> . . .
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> b. A **Generation Flexibility Plan** designed to enable HECO to accommodate greater quantities of low cost energy resources.
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> . . .

[10]Decision and Order No. 32052 at 72-73 (emphasis added).

c. A **Must-Run Generation Reduction Plan** to reduce or eliminate the must-run designation and operation of generating units on HECO's power supply system and enable HECO to accept additional lower-cost energy resources and maintain system reliability.

. . .

d. An **Environmental Compliance Plan** to meet expected and possible changes in environmental regulations, including Section 111-D and Hawaii Green House Gas (GHG) requirements, in a least-cost manner.

. . .

e. A **Key Generator Utilization** Plan to address unique economic and operational challenges for key Oahu generating units to ascertain whether these units should be retired, generating unit or contract life extended, or operations altered, to ensure these units create benefits for Oahu's ratepayers, to the extent these challenges are not addressed elsewhere in the PSIP.

. . .

f. An **Optimal Renewable Energy Portfolio Plan** to identify the key technical, economic and geographic location parameters that delineate the optimal, least-cost, diverse portfolio of renewable energy resources.

. . .

g. A **Generation Commitment and Economic Dispatch Review** to ensure that existing generation resource allocation policies and practices yield the most fuel-efficient and cost-effective outcome given HECO's potential evolving portfolio of power supply

resources.[11] [emphasis in the original; detailed requirements for each subsection omitted].

In Decision and Order No. 32053, the commission identified several components to be included, at a minimum, in MECO's PSIP:

> a. A **Generation Fleet Adequacy Analysis**, which shall inform the commission as to potential roles each generating unit on the MECO system can perform in the future, if any.
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> . . .
>
> b. ... an **Optimal Renewable Energy Portfolio Plan** to identify and describe, based on the analyses performed in the PSIP, how MECO will develop an optimal, least-cost, diverse portfolio of renewable energy resources to meet and exceed a 40 percent level of renewable energy.
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> . . .
>
> c. A **Generation Commitment and Economic Dispatch Review** to ensure that existing generation resource allocation policies and practices yield the most fuel-efficient and cost-effective outcome given MECO's potential evolving portfolio of power supply resources.
>
> . . .
>
> d. **Additional Considerations** to potentially reduce MECO's future cost of service.[12] [emphasis in the original; detailed requirements for each subsection omitted]

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[11]Decision and Order No. 32053 at 92-103.

[12]Decision and Order No. 32055 at 92.

On June 4, 2014, HELCO notified the commission by letter committing to file an updated PSIP no later than August 26, 2014, consistent with the HECO and MECO PSIPs.

III.

PROCEDURAL HISTORY

The commission directed MECO, HECO, and HELCO to each produce a PSIP in orders issued in three separate dockets.

The commission directed HELCO to prepare a PSIP in Decision and Order No. 31758, issued on December 20, 2013, in Docket No. 2012-0212, in the matter of the APPLICATION FOR APPROVAL OF A POWER PURCHASE AGREEMENT FOR RENEWABLE DISPATCHABLE FIRM ENERGY AND CAPACITY for the Hu Honua bioenergy project.

On April 21, 2014, HELCO filed its initial PSIP in response to Order No. 31758. On April 28, 2014, the commission directed HECO to prepare and file a PSIP on or before August 26, 2014.[13] Also on April 28, 2014, the commission directed MECO to prepare and file a PSIP on or before August 26, 2014.[14] On June 4, 2014, HELCO notified the commission by letter that it would file an updated PSIP no later than August 26, 2014.

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[13]Decision and Order No. 32053 at 91-105.

[14]Decision and Order No. 32055 at 86-94.

On August 7, 2014, by Order No, 32257, the commission opened the instant docket consolidating the review of the PSIPs in a single proceeding. In addition, the commission named each of the individual utilities and the Consumer Advocate ("CA") as parties to the proceeding, and stated that "[a]ny interested individual, entity, agency or community or business organization could file a motion to intervene or participate without intervention in the docket.[15]

The commission received motions to intervene from twenty-one petitioners: Renewable Energy Action Coalition of Hawaii, Inc.; Life of the Land; NextEra Energy Hawaii, LLC; Hawaii Solar Energy Association; Puna Pono Alliance; County of Maui; The Alliance for Solar Choice; Hawaii Renewable Energy Alliance; The Gas Company, Inc.; AES Hawaii, Inc.; Blue Planet Foundation; Ulupono Initiative LLC; Hawaii PV Coalition, the Department of Business, Economic Development, and Tourism; Sierra Club; Tawhiri Power LLC; Sunpower Corporation; Paniolo Power Company, LLC; Eurus Energy America Corporation; County of Hawai`i; and First Wind Holdings, LLC[16] (collectively "petitioners").

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[15]Decision and Order No. 32257 at 5.

[16]The commission observes that since the filing of First Wind's motion to intervene, First Wind has been acquired by SunEdison.

On August 26, 2014, in response to the commission's orders, each of the HECO Companies filed a PSIP.

On September 5, 2014, the commission issued Order No. 32294, which invited the public, including petitioners, to review the PSIPs and to provide written comments concerning the PSIPs to the commission prior to the issuance of a procedural order and the admission of Parties in this docket. These comments were intended to assist the commission in its initial review of the PSIPs.

The commission received extensive comments from several petitioners, organizations, state agencies, and more than 300 individual members of the general public. These comments are discussed further below.

On September 26, 2014, the commission issued information requests to the HECO Companies related to the various PSIP filings. In general, the commission sought more detail and documentation in support of key figures, assumptions, and conclusions contained in the PSIP filings.

On October 10, 2014, the HECO Companies responded to the commission's information requests, and subsequently filed "Errata and Revised Responses..." on November 21, 2014. The Companies filed a "Revised Response to PUC-HECO-IR-21

Commission Information Request Filed November 21, 2014" on January 12, 2015.

In the interest of facilitating stakeholder review of the PSIPs, the commission uploaded the voluminous electronic files submitted by the HECO Companies in response to the commission's information requests to the commission's website.[17]

IV.

PUBLIC COMMENTS

By Order No. 32294 issued on September 12, 2014, the commission invited public comments on the HECO Companies' Power Supply Improvement Plans. The commission stated that,

> [w]hile not intending to limit the public comments in any fashion, the commission observes that it would be helpful for commenters to address whether the plans provide clear, actionable strategies to:
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> • lower and stabilize customer bills;
>
> • integrate a diverse portfolio of cost-effective renewable energy projects;
>
> • operate each island grid reliably and cost-effectively with substantial quantities of variable renewable energy resources; and

[17]See December 12, 2014 letter from the Commission; files can be found at http://puc.hawaii.gov/trending-dockets/2014-0183-instituting-a-proceeding-to-review-the-power-supply-improvement-plans-for-hawaiian-electric-company-inc-hawaii-electric-light-company-inc-and-maui-electric-company-limited/

- contain appropriate strategies and timely action plans, supported by well-reasoned and compelling analyses, to achieve these goals on each island.[18]

As provided in Order No. 32294, public comments were accepted through October 6, 2014. Additional comments were received after this date and are included in this summary.

Comments were provided by several petitioners, organizations, state agencies, and over 300 individual members of the general public. Commenters include:

- Petitioners: Renewable Energy Action Coalition of Hawaii, Inc.; Life of the Land; NextEra Energy Hawaii, LLC; Hawaii Solar Energy Association; County of Maui; The Alliance for Solar Choice; Hawaii Gas; Hawaii PV Coalition; DBEDT; Tawhiri Power LLC; Sunpower Corporation; and Paniolo Power Company, LLC.

- Organizations: Earth Justice; The Natural Resources Defense Council; Indigenous Consultants, LLC; Hu`Ena Power; Enphase Energy, Inc.; Stem, Inc.; The Green Energy Institute at Lewis and Clark School; The Hawaii Shippers Council; South Maui Renewable Resources; Sempra LNG; Maui Tomorrow;

[18]Order No. 32294 at 4.

Eastland Group, Ltd.; Office of Senator Malama Solomon; Steffes Corporation; and Castle and Cooke Hawaii.

- Agencies: Division of Consumer Advocacy, Department of Commerce and Consumer Affairs; and the Office of Hawaiian Affairs.

A.

Summary of Public Comments

Commenters provided notably consistent general observations regarding the HECO Companies' PSIPs. An overwhelming majority of commenters support the general intent of the plans to lower customer bills, expand customer options, and increase renewable energy. However, many commenters state that these general goals are unsubstantiated by and inconsistent with the more specific elements of the plans.

Several commenters maintain that there is insufficient discussion and quantitative support to validate HECO's determination that the proposed "Balanced Portfolio DG 2.0" provides the most value to ratepayers. An overwhelming majority of comments strongly advise against the HECO Companies' proposed fixed charges and demand charges proposed in "Balanced Portfolio DG 2.0".

Many commenters state that the PSIPs do not adequately examine how the final "Preferred Plan" compares to other

alternatives. Several commenters maintain that the plans are not in the public interest because they preserve a traditional utility-centric business model, not a customer-focused one.

An overwhelming majority of commenters maintain that the plans fail to demonstrate how the utility will minimize the curtailment of renewable energy generation.

Substantially detailed comments were provided by the commenting petitioners and several other organizations. There is unanimity amongst commenters who addressed several areas of concern in the PSIPs. These include statements that the plans appear to be general and lack a decision framework, clear assumptions, actionable strategies, and a timeline to achieve goals. In particular, a vast majority of petitioners share the concern that the plans have no clear or actionable strategy for assuring stable rates while providing well-reasoned and concrete solutions for integrating customer-sited DER in both the short-term and the long-term. Several petitioner comments state that the PSIPs fail to respond to commission orders and do not uphold the State's energy policy directives.

Most of the petitioners state that the analyses provided in the PSIPs are difficult to evaluate due to HECO's failure to clearly provide underlying data, assumptions, and models. There was concern among these petitioners that the

PSIPs provided no analysis demonstrating the rationale behind the five "end-states" and why HECO selected "Balanced Portfolio DG 2.0" as the "Preferred Plan". These petitioners also state that the PSIPs provide no supporting analysis for how an interconnected, modernized grid will be developed and fail to show how high levels of renewable energy will be developed. All petitioners who expressed concern about the HECO Companies' proposal to utilize LNG agree that Companies' plans are ambiguous. Many commenters do not support the use of LNG as a long-term fuel source.

Several petitioners note that the potential for mass grid defection should be a motivation for the utility to develop more aggressive and meaningful plans.

The following summaries focus on several of the common or overarching themes expressed throughout the public comments. These themes address the following aspects of the PSIPs:

- Must-Run Generation;
- Optimal Renewable Energy Portfolio Plan;
- Distributed Energy Resources;
- HECO's Inverter Retrofit Proposal;
- Energy Storage;
- Rate Design;
- Inter-Island Cable;

- LNG;
- Geothermal; and
- Coal, Biomass, and Waste-to-Energy.

B.

Must-Run Generation

One of the petitioners provides detailed feedback on how the utility responded to the commission's request to address how it will reduce must-run generation.[19] This petitioner states that, while MECO does provide an action plan for reducing must-run generation,[20] both the HECO and HELCO PSIPs fail to provide sufficient analysis.

C.

Optimal Renewable Energy Portfolio Plan

One of the petitioners expresses concern that the HECO PSIP fails to comply with commission's directives to identify key technical, economic, and geographic location parameters that delineate the optimal, least-cost diverse portfolio of renewable

[19]These comments reference Decision and Order No. 32052 at 72.

[20]These comments reference MECO PSIP at 5-22.

energy resources.[21] Several petitioners maintain that the plans: do not provide an analysis of the appropriate mix of variable & firm renewable energy resources; do not provide adequate analyses of reserve margins, ancillary services, and generation unit upgrades; and/or fail to analyze cost and ratepayer impacts resulting from full attainment of RPS.

D.

Distributed Energy Resources ("DER")

Several of the petitioners and commenting organizations state that, in HECO's "Preferred Plan," customers and independent power producers only contribute a small amount to the increased percentage of electricity produced from renewables and that the "Preferred Plan" disproportionately favors utility-owned assets. These commenters maintain that the PSIPs also fail to address technical barriers associated with the increased interconnection of DER. Some of the petitioners maintain that the plans also exaggerate costs for system upgrades by using overly conservative assumptions and rare contingencies. One petitioner expresses concern that the plans use customer DERs to justify major increases in utility spending and ratebase.

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[21]These comments reference Decision and Order No. 32052 at 5.

A prevailing number of petitioners and commenting organizations are concerned that the PSIPs only consider the cost of distributed generation and do not take into account the benefits of distributed generation. These commenters suggest that because plans ignore the potential to utilize distributed photovoltaic generation "DG-PV" as a flexible resource, it is unlikely that any value is being assigned to DG-PV as a potential ancillary service.

Some commenters maintain that the PSIPs do not provide enough detail about transmission and distribution ("T&D") costs. These commenters are concerned that the HECO Companies do not disclose the methods used to determine T&D costs with sufficient detail.

There is concern among some of the petitioners and commenting organizations that the PSIPs do not mention efforts to work with state programs such as the Green Energy Market Securitization ("GEMS") and on bill financing programs to incentivize DG-PV. These commenters argue that the PSIPs fail to consider micro-grids and energy districts as requested by the commission.[22]

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[22]These comments reference Decision and Order No. 32052, Exhibit A at 12.

E.

Inverter Retrofits Proposal

Concern has been expressed by some of the petitioners and some of the commenting organizations regarding HECO's plan to perform a retroactive adjustment of 200 MW of operational inverters on existing rooftop PV systems.[23] The proposed changes to HECO's Rule 14H indicate that inverters will be retrofitted for all customers with new frequency settings to the ride-through standards. One petitioner is concerned about the high percentage of inverters that that must be visited on an individual basis because they cannot be retrofitted remotely via online connection. This petitioner points out that the PSIPs do not indicate how the utility plans to cover the cost of its planned retrofits nor the timeframe associated with potential manual modifications to several thousand systems and is worried that there is a chance that the utility may assume that the cost of site visits will be covered by the inverter manufacturers.

Other commenters argue that the utility has made a blanket conclusion with no support and no indication of how much reliability benefit would result from specific amounts of inverter retrofits. Comments suggest that as an alternative to

[23]These comments reference the PSIPs of HECO, MECO, and HELCO at 4-39.

manual inverter retrofits, updated load shedding protocols combined with a partial online retrofit would be a better strategy to address system level issues. Comments recommend that remote upgrade capability be required for all new inverters.

F.

Energy Storage

Commenters express a combination of support and apprehension regarding how the PSIPs address energy storage. Commenters generally support the utility's position that "... customer-side energy storage might be aggregated to achieve the same benefits as utility-scale energy storage".[24] However, some commenters disagree with the utility's assumption that distributed storage will cost more than bulk storage.[25] Commenters point out that HECO only mentions the possibility of adding energy storage to provide additional contingency reserve. These commenters are concerned that the PSIPs do not provide specific planning, cost analysis, or other action to manage system reliability issues. One commenter maintains that the utility's

[24]These comments reference HECO PSIP at 5-35; MECO PSIP at 5-38; and HELCO PSIP at 5-28.

[25]These comments reference HECO PSIP at 5-35; MECO PSIP at 5-38; and HELCO PSIP at 5-29.

plan to address system stability is inadequate and limited to the proposed DG-PV retrofit, protective relaying, communications improvements, and reducing the maximum output of AES.

Regarding the MECO PSIP, one of the petitioners does not support MECO's decision to exclude pumped-storage hydro from the PSIP preferred plan. This petitioner questions MECO's finding that pumped storage hydro is not cost-effective.[26]

In reference to storage procurement, one commenter recommends a use-case based approach to procurement and planning for storage, rather than a technology or equipment based approach.

G.

Rate Design

The most frequently mentioned topic in the public comments is HECO's proposed rate design, referred to in the PSIPs as "DG 2.0." In addition to the petitioners and commenting organizations, over 300 members of the general public wrote in strong opposition to HECO's proposed monthly fixed charge for all residential customers ($61 for HELCO customers, $55 for HECO customers, and $50 for MECO customers) and the additional proposed monthly charge for new customer-owned distributed

[26]These comments reference MECO PSIP at 7-2.

generation ($16 for HELCO and HECO DG 2.0 customers and $12 for MECO DG 2.0 customers).[27] A substantial majority of those that voiced opposition to the DG 2.0 rate structure maintain that they also do not support the potential elimination or modification of NEM.

An overwhelming majority of commenters consider the higher fixed fees and demand charges in the DG 2.0 proposal a disincentive for energy efficiency and DER. These commenters argue that HECO's preferred plans fail to demonstrate a fair and equitable split in cost and benefits between ratepayers and shareholders. These commenters suggest that higher fixed charges fundamentally shift costs to low-income and other low-energy users. Some commenters indicate that the DG 2.0 rate structure may lead to widespread grid defection. Instead of the HECO Companies' "DG 2.0" proposal, most of the petitioners and commenting organizations argue for the adoption of a Minimum Bill, time-of-use rates, and/or the continuation of net energy metering.

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[27]These comments reference HECO PSIP at 6-4; MECO PSIP at 6-5; and HELCO PSIP at 6-4.

H.

Inter-Island Cable

Several of the petitioners and commenting organizations do not support the PSIPs' conclusion that the Oahu-Maui grid tie is not a preferred option.[28] These commenters suggest that HECO's finding is fundamentally flawed and not supported by detailed analysis. Several of the petitioners specifically note that HECO's conclusions regarding a potential inter-island cable system differ substantially from previous analyses that state that the benefits of an inter-island cable far outweigh the costs. Commenters feel that more transparency in HECO's data and methodology would enable interested persons to better understand why HECO's conclusions about inter-island cable are so markedly different from the conclusions reached by prior studies and the HECO Companies' IRP filed in 2013.

One commenter suggests that an inter-island cable would be more costly than increasing PV-DG penetration and that grid services provided by DG-PV should be considered as a potential alternative to cable.

[28]These comments reference MECO PSIP at 7-3.

I.

LNG

An overwhelming majority of the petitioners and commenting organizations express concern regarding the Companies' intent to use LNG as a long-term energy solution.[29] Additionally, 45 public comments opposed any use of LNG, while 3 public comments supported use of LNG. While some comments maintain that any use of LNG would preclude the use of indigenously produced clean, renewable energy, other comments suggest that LNG should only be used as bridge fuel if it can be deployed with true cost savings.

One of the petitioners supports containerized LNG as a short-term solution, but opposes HECO's proposal to use LNG as a long-term solution by converting all plants to gas. Several petitioners and commenting organizations argue that the HECO Companies fail to show how the importation and procurement of LNG via ISO containers will benefit ratepayers and that the plans do not consider the effects LNG would have on the DG 2.0 proposal.[30] These commenters state that financial risk becomes more prominent in the second phase of the utilities' LNG strategy to invest in a bulk LNG terminal and handling facilities.

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[29]These comments reference HECO PSIP at I-4.

[30]These comments reference HECO PSIP at I-2.

An overwhelming majority of commenters are troubled by HECO's lack of specificity regarding near-term plans to import LNG via ISO containers and long-term plans to import in bulk. Several commenters are concerned that the PSIPs do not contain cost-benefit comparisons of various fuel switching options, renewable generation, or the installation of air pollution control devices in existing plants. Many commenters feel that allowing LNG to comprise a substantial portion of the state's energy mix provides no change to HECO's practices.

Several petitioners and commenting organizations express the concern that the PSIPs lack detail on the implications of rapid retirement of existing HECO units. One commenter states that replacing existing units with more efficient generation would actually decrease the overall LNG demand projected in the PSIPs. Many commenters maintain that HECO's gas infrastructure plans to support LNG activities are not clear.

Many of the petitioners and commenting organizations note that the PSIPs lack detail regarding financing capital expenditures for LNG infrastructure. These commenters state that HECO disregarded the commission's directive to analyze the fuel expenses, operations and maintenance ("O&M") expenses, and capital

costs associated with switching from low sulfur fuel oil ("LSFO") to ultra-low sulfur diesel ("ULSD") or natural gas.[31]

A majority of the petitioners and commenting organizations state that the PSIPs lack other necessary information for the following LNG activities: 1) schedules for permitting and implementation; 2) the short-term and long-term delivered costs of fuel; 3) power plant conversion costs; 4) the capital budget involved with containerized LNG; 5) the capital budget involved with a bulk LNG terminal; 6) a sensitivity analysis to assess the risks associated with LNG's price volatility; and 7) environmental and safety considerations. Commenters note that HECO's projection of LNG prices from 2017 through 2021 is not supported and that analysis of pricing associated with delivering bulk LNG after 2022 is limited.

One of the commenting organizations notes that timeframes presented in the PSIPs for different LNG import options represent earliest possible dates,[32] and by global comparison, are considered very short-lived for capitalized infrastructure.

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[31]These comments reference Decision and Order No. 32053 at 96.

[32]These comments reference HECO PSIP at I-2. HECO proposes to import containerized LNG from 2017-2023 and bulk LNG from 2023-2030.

A majority of commenters are also concerned that the plans do not provide a timeline for transitioning away from LNG for electricity generation.

Petitioners and commenting organizations are concerned that the plans fail to show how consumers will be protected from price volatility. These commenters argue that HECO failed to compare LNG with other energy alternatives with respect to capital costs, fuel price risks, fuel price volatility, and the risk of capitalized infrastructure becoming stranded assets. These commenters are concerned that ratepayers would be vulnerable to the volatility of LNG prices.

Several comments suggest that that capital investment for LNG infrastructure could instead be used for infrastructure needed to integrate more renewables. Comments suggest that renewables may offer a more reliable hedge against volatile oil and gas prices than LNG, especially considering the uncertainty in long term forecasts of natural gas prices.

One of the petitioners maintains that HECO's plans to store and re-gasify LNG at a HECO property adjacent to the KPLP facility[33] would be redundant infrastructure that is too costly and not in the ratepayers' interest. This commenter

[33]These comments reference HECO PSIP at 5-18.

expresses concern that neither a "floating" nor "shore-side" LNG receiving terminal on Oahu addresses the delivery of LNG to neighbor islands. Comments note that the PSIPs do not identify locations on the neighbor islands where LNG could be stored and re-gasified or the costs associated with such infrastructure.

J.

Geothermal

Extensive public comments focus on HELCO's geothermal proposals. Some commenters express concern that HELCO's "Preferred Plan" includes no new east-side geothermal resources in the Kilauea East Rift Zone nor the development of any new geothermal resources before 2025. Commenters note that the HELCO PSIP fails to indicate when the utility will take its fossil fuel plants offline to accommodate geothermal energy as a replacement for firm power. Several commenters argue that the HELCO PSIP prioritizes fossil fuel and biofuel generation so that the utility may continue operating its old fossil fuel plants to optimize its profit margin. Commenters maintain that this will delay the integration of renewable energy resources, including geothermal.

Several public comments maintain that there was no transparency regarding the inputs for the sensitivity analysis

HECO performed for its base plan to compare the system costs for geothermal plants located in East Hawaii and West Hawaii.[34] Some members of the public expressed suspicion that HELCO used the PSIP and the RFP process to deliberately delay geothermal development by obtaining proprietary information from private sector bidders. These commenters feel that HELCO used this information in the PSIP analysis to exaggerate assumed costs of geothermal resources. Some commenters are concerned that HELCO's assessment of geothermal capital costs is flawed because it is based on data selected from two separate reports that are inconsistent.

Concern has also been expressed by one of the petitioners and one commenting organization regarding MECO's proposals for geothermal on Maui Island. These commenters maintain that MECO's geothermal resources should not be presumed to be feasible until test wells can prove the viability of the resource.

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[34]These comments reference HELCO PSIP at L-7.

K.

Coal, Biomass, and Waste-to-Energy

Concern was expressed by some of the petitioners that the HECO PSIP provides no supporting basis for the assumed large-scale shift to biomass fueling of the AES coal plant.[35]

Some of the commenting organizations and the general public stated that they do not feel that waste-to-energy and biomass resources should be considered renewable energy resources.

V.

DISCUSSION

In this section the commission provides observations and preliminary determinations based on its initial review of the PSIPs, responses to information requests, and public comments. These observations and preliminary determinations are subject to further consideration and careful examination of the record in the full course of proceedings in this docket.

[35]These comments reference HECO PSIP L-6.

A.

Use and Purposes of the PSIPs

The purpose of the PSIPs is to provide context and analytical support for several major pending and future resource acquisition and system operation decisions. The PSIPs should address the need for applications for approval of individual capital projects, programs, contracts and RFP's to be considered with the benefit of the context provided by well-vetted, sufficiently analyzed comprehensive system plans.

In framing the scope of most recent IRP process for the Companies, the commission identified several Principal Issues ("IRP Principal Issues") to be addressed in determining viable Action Plans.[36] In rejecting the HECO Companies' IRP Reports, the commission specified that, in lieu of approved IRP Action Plans, all subsequent applications and submissions by the Companies "shall be subject to additional careful and detailed scrutiny, while taking into consideration the Principal Issues identified by the commission, as appropriate."[37] Several of the

[36]At the beginning of the Companies' most recent IRP process, the commission identified several Principal Issues to be addressed by the Companies in Decision and Order No. 30534 at 5-13.

[37]Decision and Order No. 32052 at 71.

IRP Principal Issues were identified within the scope of the specific issues to be addressed by the Companies in the PSIPs.[38]

More specifically, the PSIPs are intended to serve several purposes that will inform evaluation of major pending and future resource acquisition and system operation decisions, including the following:

1. The PSIPs should provide long-term analysis of the integrated utility systems to inform evaluation of specific near-term capital investments and other decisions. Without the context of long-range utility system analysis, it is difficult to establish the prudence of proposed resource acquisition and operational decisions.

2. The PSIPs should provide context and analysis to inform choices and trade-offs between major inter-related and/or mutually exclusive resource strategies. Decisions regarding inter-island transmission connections, renewable generation resource selections and penetrations, LNG import strategies, retirement or refueling of existing fossil generation units, and resources to provide necessary ancillary services, for example, are all inter-related. The need for prolonged

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[38]Specific issues to be addressed in the Companies' PSIPs were identified in Decision and Order No. 32053, Decision and Order No. 32055, and Decision and Order No. 31758.

parallel planning and associated investments to maintain the flexibility to acquire multiple mutually-exclusive or redundant possible options can be reduced or avoided by decisive determinations, where appropriate, based on sound analysis.

3. The PSIPs should provide assurance that the overall cost and rate impacts of utility system operations and proposed resource acquisitions are reasonable, economic and affordable. The PSIPs should provide a context for determining whether costs and rates would be reasonable enough to discourage non-beneficial customer system exit. A resource strategy that results in rates high enough to drive customers away from the utility system at the expense or to the detriment of remaining "captive" customers is not tenable.

4. The PSIPs should identify risks and uncertainties and inform the issues and trade-offs associated with resource acquisition and system operation decisions. The PSIPs can serve as a base plan and set of assumptions for purposes of further planning and analyses.

As noted in the Background section above, the commission has provided more specific guidance regarding the requirements and necessary components for the HECO Companies' PSIPs.

B.

Commission's Observations and Concerns

In rejecting the HECO Companies' IRP Report, the commission noted a lack of evidence of an acceptable course correction by the HECO Companies towards developing and implementing a sustainable business model. Thus, the commission was compelled to offer the Commission's Inclinations to provide perspectives on the vision, business strategies, and regulatory changes required to align the HECO Companies' business model with customers' interests and the state's public policy goals. In the Commission's Inclinations, the commission articulated a number of strategies related to the generation system that would lower and stabilize the costs of generation. These strategies include:

- Seek high penetrations of lower-cost, new utility-scale resources;
- Modernize the generation system to achieve a future with high penetrations of renewable resources;
- Exhaust all opportunities to achieve operational efficiencies in existing plants; and
- Pursue opportunities to lower fuel costs in existing power plants.[39]

Concurrently, based on significant concerns that HECO was not adequately anticipating major additions of renewable

[39]Commission's Inclinations at 4.

resources to the Oahu grid and moving quickly enough to address high generation costs, the commission directed HECO to prepare a PSIP that would:

> provide plans as to how HECO intends to accomplish the integration of substantial amounts of variable renewable energy resources, in a reliable and economic manner, without significant curtailments of existing and future renewable resources.[40]

In summarizing its directive to HECO to prepare a PSIP, the commission stated:

> The commission concludes that HECO has the responsibility to make major changes to its existing fossil generation portfolio, its demand response portfolio and its current power supply operational practices in order to accommodate large amounts of variable renewable energy, reduce power supply costs and to provide significant customer rate relief. The commission expects HECO to utilize the PSIP process as an opportunity to re-examine its existing fossil generation portfolio, demand response program and current power supply operational practices in order to develop actionable strategies and implementation plans to expeditiously retire older, less-efficient fossil generation, reduce must-run generation, increase generation flexibility, and adopt new technologies such as demand response for ancillary services and energy storage and institute operational practice changes, as appropriate to enable integration of a diverse portfolio of additional low cost renewable energy resources.

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[40]Decision and Order No. 32053 at 91.

> In preparing the PSIP, HECO should focus on formulating well-reasoned strategies and resulting action plans that can be implemented expeditiously, and that are supported by analyses as appropriate. The commission is interested in a PSIP submission that contains improvement strategies and action plans (emphasis added).[41]

In reviewing the initial PSIP filings with respect to the guidance laid out in Section 1 of the Commission's Inclinations, the orders directing the HECO Companies to file PSIPs, and past planning guidance in the IRP process,[42] the commission has developed eight preliminary observations and concerns ("Observations and Concerns") addressing major components and the overall impacts of the proposed plans:

#1 PSIP Cost Impacts and Risks Have Not Been Demonstrated To Be Reasonable.

#2 PSIPs Do Not Appear to Aggressively Seek Lower-Cost, New Utility-Scale Renewable Resources.

#3 PSIPs do not Adequately Address Utilization and Integration of Distributed Energy Resources.

#4 Proposed Plans for Fossil-Fueled Plants are not Sufficiently Justified.

#5 System Security Requirements Appear Costly and Are Not Sufficiently Justified.

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[41]Decision and Order No. 32053 at 104.

[42]Particularly, the "IRP Principal Issues" identified at the beginning of the recent IRP process.

#6 Proposed Plan for Provision of Ancillary Services Lacks Transparency and May Not be Most Cost-Effective Option.

#7 PSIP Analysis on Inter-Island Transmission Lacks Sufficient Detail.

#8 Customer and Implementation Risks are not Adequately Addressed.

The commission is articulating these Observations and Concerns to provide further guidance for supplemental analysis and amendment of the plans. It is ultimately the responsibility of the HECO Companies to develop and demonstrate that their proposed improvement strategies and action plans are reasonable and in the public interest. A subsequent section of this order will further outline the procedural schedule and statement of issues for this proceeding. The remainder of this section will detail the commission's Observations and Concerns with the initial PSIP filing and responses to commission information requests.

1.

Commission Observation and Concern #1:
PSIP Cost Impacts and Risks
Have Not Been Demonstrated To Be Reasonable

In statements to the public and the State Legislature, the HECO Companies have widely touted the PSIPs as cost saving strategies, prominently and exclusively citing dramatic

twenty percent (20%) average residential bill reductions. These characterizations give the deliberate impression that the PSIPs are dramatically effective cost-reducing strategies, when, in fact, these cost reductions appear to result primarily from customers' own actions in response to rising electricity rates, energy efficiency programs administered by third-parties, and available self-generation alternatives.[43] In other words, purported customer bill reductions are not primarily due to power supply improvements identified in the PSIPs.

The Companies' laudatory portrayal of PSIP cost and rate impacts is a selectively limited and potentially misleading characterization of the supporting analyses included in the Companies' PSIPs. Closer examination indicates that the PSIP costs and rate impacts are indeed a cause for concern and need to be carefully examined and mitigated. As discussed below, the PSIP analyses indicate that capital expenditures and Company earnings would dramatically increase, beginning in the very near term, whereas the customer bill relief proclaimed by the Companies would be achieved only late in the planning period and occur only if several speculative assumptions are realized.

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[43]The Companies' claims are based on results for "Full Service" residential customers that do not install distributed generation.

As discussed in several sections below, it appears that alternative options and strategies are available that would be more cost-effective than the resources and strategies proposed in the PSIPs. The commission reiterates that cost and rate impacts, specifically minimizing and stabilizing costs, are primary considerations in the analysis and evaluation of the reasonableness of utility resource plans.[44] Stated simply, the HECO Companies have not adequately demonstrated that the costs and rate impacts of the plans identified in the PSIPs are reasonable.

a.

HECO Companies' Characterization of
PSIP Costs and Rate Impacts Appears Misleading

The Companies' prominent claims regarding 20% bill reductions are based on several assumptions that, as presented in the PSIPs, do not comprise a reasonable or forthcoming

[44]Decision and Order No. 30534 at 6, identifying the IRP Principal Issues, stated that "[t]he affordability of utility-provided energy services is a primary concern and objective of the commission." The affordability of electricity is clearly a primary issue that must be addressed and considered in any application that affects customer costs and rates.

interpretation of the results of HECO's own analysis, and are potentially misleading.[45]

The average customer bills in the Companies' characterizations are premised on the assumption that average customer electricity consumption would decrease significantly in the last few years of the planning period. Electricity consumption for the average residential customer bill is presumed in the PSIPs to decrease by 24% for HECO, 19% for MECO and 21% for HELCO during the 2014 to 2030 planning period.[46] The magnitude of this assumed reduction in consumption per customer has an obvious effect on the average residential customer bill. In other words, projected lower bills at the end of the planning period are due primarily to the assumption that customers would simply be using much less electricity in the future.

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[45]The specific assumptions used in deriving the HECO Companies' claims regarding bill impacts were not provided in the PSIPs but were obtained from the Companies' subsequent responses to information requests by the commission regarding details of the underlying analysis.

[46]Derived from responses to PUC-HECO-IR-4, as amended November 2, 2014. The average Oahu residential customer bill is assumed to decrease by 22% during the last six years of the planning period. The reduction in consumption per residential customer in the last six years of the analysis represents over 90% of the overall reduction in consumption for the planning period.

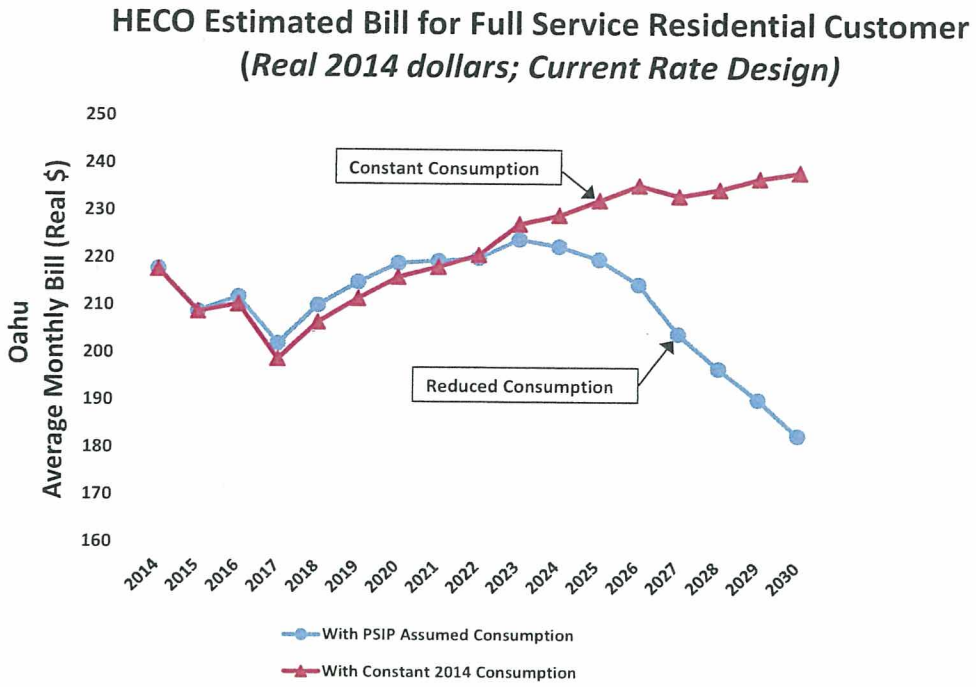

Figure 1: HECO Estimated Residential Bill, Real $2014

The chart above shows estimated residential bills based on the PSIP analyses for HECO.[47] As shown, residential bills would decrease late in the planning period for a customer who reduces consumption as assumed in the PSIP analyses. As also shown by the PSIP analyses, bills would actually increase for a customer that used same amount of energy throughout the planning period due to rate increases that exceed the rate of inflation (real $2014).

As shown in Figures 2 and 3 below, for MECO (Maui Island) and HELCO residential customers, bills predicted by the PSIP

[47]Data in Figure 1 are derived from response to PUC-HECO-IR-4, as amended November 2, 2014.

analyses, after adjustment for inflation, would decrease for customers with constant monthly energy consumption, but not as dramatically as proclaimed in the Companies' PSIPs (and, as noted below, would increase in nominal terms).[48]

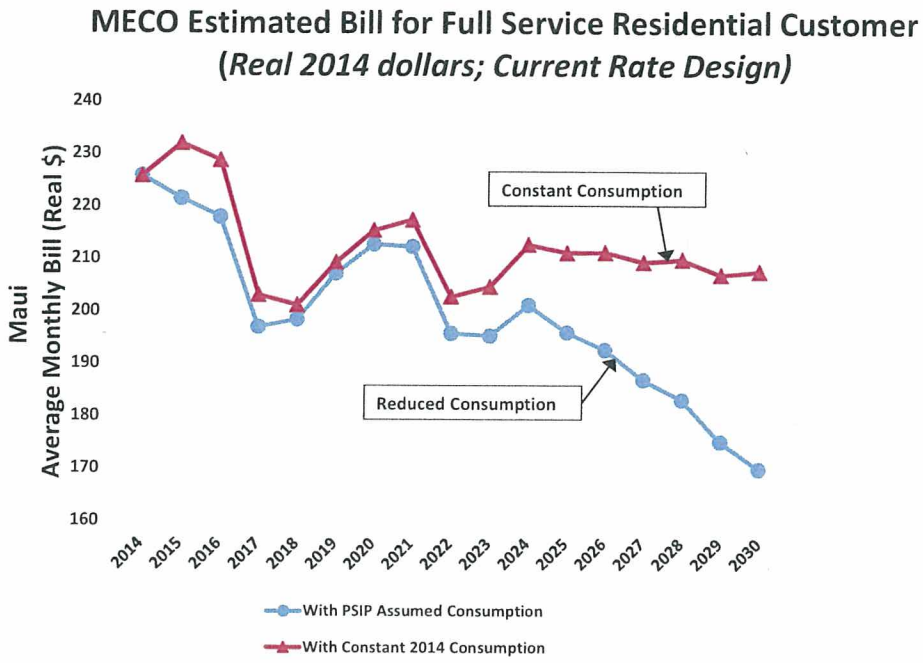

Figure 2: MECO Estimated Residential Bill, Real $2014

[48]Data in Figures 2 and 3 are derived from response to PUC-HECO-IR-4, as amended November 2, 2014.

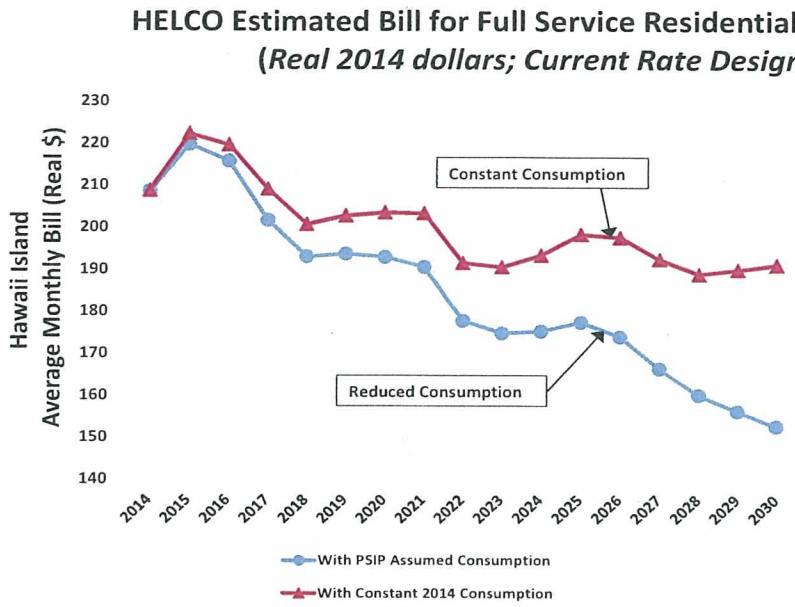

Figure 3: HELCO Estimated Residential Bill, Real $2014

The results of the PSIP analyses do not indicate that the PSIPs would dramatically reduce the costs of electricity to customers. As indicated in Figure 4 below, the average electric rates for HECO would not only remain several times higher than expected U.S. average electric rates, but would further increase at a higher rate than U.S. average rates over the PSIP planning period.[49] Average rates for MECO and HELCO according to the PSIP

[49]Historical data are from US Energy Information Agency (EIA), Electric Power Annual 2013, Table 2.4; Average Retail Price of Electricity to Ultimate Customers, Total Electric Industry (cents per kilowatt-hour), March 2015; Forecast of U.S. Average Electricity Rates is from US EIA, Annual Energy Outlook 2014 (AEO 2014), Table 95, Electric Power Projections by Electricity Market Module Region, derived from End-Use Prices (nominal cents per kilowatt-hour), May 2014; Hawaiian Electric's forecasted rates

analyses, would initially increase, then eventually decrease but remain substantially higher than U.S. Average electric rates.

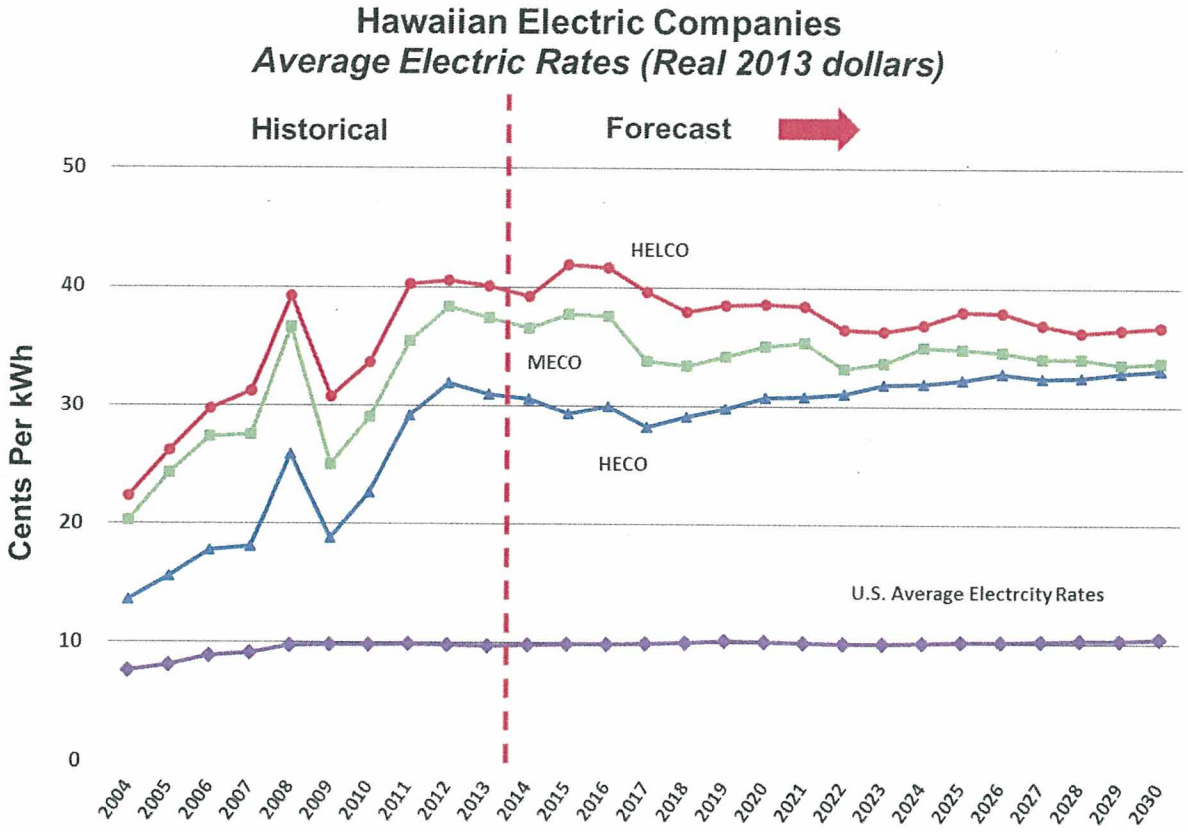

Figure 4: Historical and Forecast Average Rates, Real $2013

It is pertinent to note that HECO's characterization of bill impacts in the PSIPs and the charts above are presented in constant "real" dollars that are deflated to account for the effects of inflation. Adjusting for expected inflation is an

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derived from responses to PUC-HECO-IR-1 at 3, 23-33, as amended November 2, 2014.

accepted convention used in long-range economic analyses. It is not, however, the way *customer bill* impacts are typically stated.[50] Stated in nominal terms (i.e., using the numbers that actually appear on customer bills), customer bills would increase for all of the Companies over the planning period.[51] When stated in nominal terms, the PSIP analysis results indicate that average residential rates would increase by 46% for HECO, 24% for MECO and 26% for HELCO over the 2014 to 2030 planning period.[52]

Figure 5, below, shows the cost of average residential bills predicted by the PSIP analyses for a MECO customer with constant consumption during the planning period.[53] Bill costs are portrayed in both "real" dollars (adjusted for inflation) and "nominal" dollars (as would appear on customer bills). As shown,

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[50]Customer bills are typically reported to the commission and press as costs assuming a fixed amount of per customer consumption stated in nominal dollars unadjusted for inflation.

[51]An average Oahu residential customer bill, according to the Companies' analysis results, would increase by 12% by 2030 in nominal terms, even including the 24% reduction in consumption per customer assumed over the planning period.

[52]These percentages are derived from the HECO Companies response to PUC-HECO-IR-4(g) in this docket based on the cost of monthly bills for 600 kWh consumption. The average rates for energy charges (excluding fixed monthly charges) increase in this period by 48% for HECO, 24% for MECO and 28% for HELCO, according to the Companies' responses.

[53]Data in Figure 5 are derived from response to PUC-HECO-IR-4.

for MECO customers, bills would decrease by the end of the planning period in real terms but would increase in nominal terms. It would be more forthcoming in characterizing the bill impacts calculated in the PSIPs to provide sufficient clarification so that it is clearly understood that customer bills would go up in the assumed circumstances, but perhaps not as fast as inflation.[54]

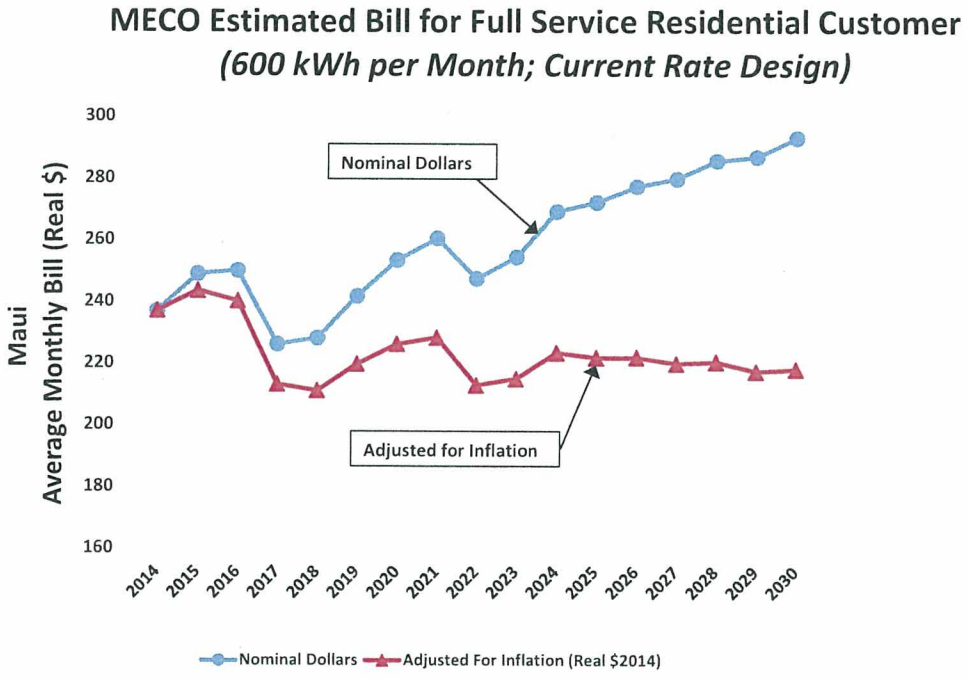

Figure 5: MECO Estimated Residential Bill, With and Without Adjustment For Inflation

[54]Note that in this case, however, HECO bills and rates (average costs per kWh) would increase whether measured in "real" dollars or nominal dollars. Customer bills for HECO would go down, as prominently claimed, only when characterized by both deflation of dollars and reductions in assumed customer consumption.

b.

PSIPs Rely on Uncertain Presumed Cost-Saving Measures

The commission observes that the characterizations of costs and bill impacts in the PSIPs are contingent upon on several substantially uncertain assumed cost-saving elements of the Preferred Plans. For example, a major component of the reduction in fuel costs in the early years of the planning period is the assumed availability and utilization of LNG fuels at prices that are economical compared to projected costs of petroleum-based fuel use. The costs and future pricing of LNG fuel, however, remain uncertain and it has not yet been determined whether, when, or how fuel switching to LNG might occur. Underscoring this concern, the Commission notes that the HECO Companies' have recently delayed the estimated dates that LNG may be available for large scale utilization in generation units by several years beyond what is assumed in the PSIP analyses.[55]

The Companies also have recently announced that development of a large-scale bulk terminal, which was a source of significant assumed fuel cost savings, may be inconsistent with

[55]See, for example, HECO Companies' response to PUC-HECO-IR-1 at 6, filed June 1, 2015, in Docket No. 2013-0141.

recently passed Legislation.[56] The Governor of the State of Hawaii has also recently announced that the State administration opposes use of LNG for generation of electric power by the HECO Companies.[57]

Another example of uncertain cost savings included in the PSIPs is the assumption that economical geothermal generation will be available on the MECO Maui Island system. MECO's Preferred Plan includes 25MW of geothermal generation commencing in 2024. In light of the fact that geothermal resources have never been successfully demonstrated on the Island of Maui, this assumption appears to be as much a speculation as it is a likelihood.

The commission notes that without these presumed cost-savings, the PSIP costs and rate impacts could be substantially higher than indicated by the Companies' PSIP preferred plans.

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[56]See Letter from G. Hirose to Commission, *PowerPoint Presentation from June 16, 2015 Technical Session*, Exhibit A at 3, filed June 19, 2015 in Docket No. 2014-0356.

[57]See *Honolulu Advertiser*, August 25, 2015, article titled: *"Ige blasts LNG as hurdle to clean energy in isles"*, by By Kathryn Mykleseth. These comments reference the announcement by Hawaii Governor David Ige, at the Asia Pacific Resilience Innovation Summits & Expo, that his administration will actively oppose the construction of any future LNG receiving stations in Hawaii.

c.

Preferred Plans Require Extensive and
Possibly Problematic Amounts of Capital Expenditure

New capital expenditures proposed in the PSIPs, totaling over eleven billion dollars, would be more than 3.5 times the amount of existing net plant in service and utility ratebase. This is shown in Table 1 below, which indicates the proposed capital expenditures in the PSIP Preferred Plans.[58]

System	Net Plant in Service 12/31/13	2015 - 2030 Capex (HECO Companies)	2015 - 2030 Capex (IPPs)	2015 - 2030 Capex (Total)
HECO	1,845	6,441	1,496	7,937
HELCO	512	1,127	320	1,447
MECO	480	1,152	490	1,642
Total	**2,837**	**8,720**	**2,306**	**11,026**

Table 1: Proposed Capital Expenditures in Preferred Plans

[58]Data in Table 1 are derived from: HECO Companies' financial statements (for 2013); Appendix K, Table K-1 of each Company's PSIP; and responses to PUC-HECO-IR-7 and PUC-HECO-IR-9. The table excludes the HECO Companies' apparently very rough estimates of costs for retirement of fossil generation units assumed in the PSIP analyses, which total $309 million (nominal) for the combined companies (PUC-HECO-IR-10).

Moreover, as shown in Figure 6 below, the capital expenditures proposed in the PSIPs are expected to be greatest in the early years of the planning period.[59] The commission observes that large front-loaded capital expenditures may present inherent risks for a utility with structurally declining sales and customer rates high enough to potentially drive significant customer system exit. It does not appear that these risks have been adequately characterized, evaluated and addressed in the PSIP analyses.

[59]Data presented in Figure 6 for the PSIP planning period are from Appendix K., Table K-1 of each Company PSIP. Historical data (2010-2014) are derived from Forms 10-K, Consolidated Statement of Cash Flows, for HECO and subsidiaries, filed by Hawaiian Electric Industries, Inc., for the years 2012-2014, shown net of Contributions in Aid of Construction. The commission is aware that certain capital expenditures in the first years of the planning period have been revised downward and/or deferred by the Companies since the time the PSIPs were filed. The adjusted capital expenditure pattern still remains extensive in magnitude and substantially front-loaded. The commission expects more recent information regarding the magnitude and timing of capital expenditures to be provided in this docket the next phases of this proceeding.

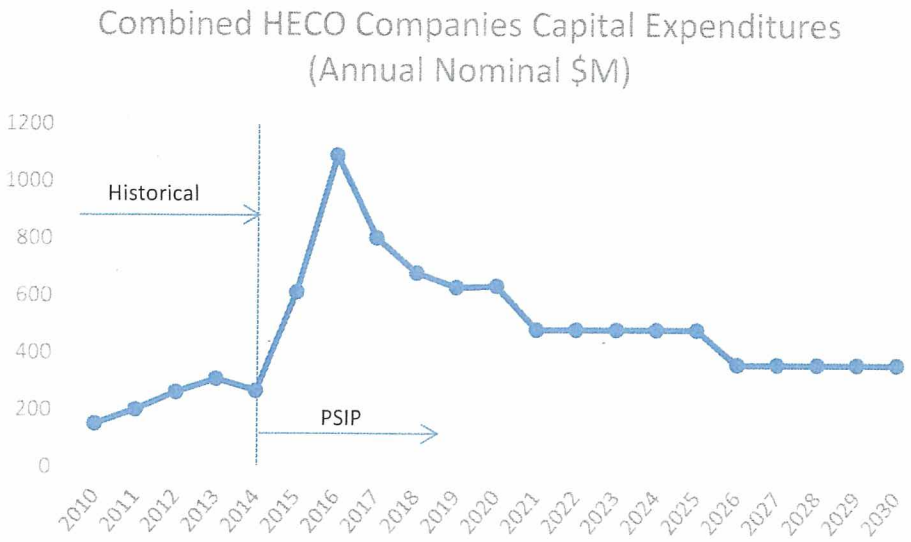

Figure 6: Proposed Capital Expenditures for Combined Companies

The magnitude of the capital expenditures proposed in the PSIP preferred plans is extensive. These expenditures are "front-loaded" with the largest annual expenditures in the first few years of the planning period. The bill savings projected by the companies from these investments, however, appear to be less certain and are delayed until the later part of the planning period. As discussed above, the substantial cost savings assumed from utilization of LNG at the beginning of the planning period, which help offset the increased fixed costs due to capital expenditures, remain uncertain. The Companies' ratebase and earnings would clearly grow substantially with the proposed capital expenditures, but not without risks and uncertain benefits. On preliminary review, it thus appears that the

magnitude and timing of the proposed capital expenditure plans may prove to be problematic in light of uncertainties regarding assumed savings and realization of customer benefits in the Preferred Plans.

Figures 7, 8, and 9 provide further detail on the cost-driving components of the Preferred Plans as presented in the PSIPs.[60] As depicted in these figures, the capital charges and equity charges increase progressively over the planning period for each of the Companies.[61] The fuel and purchased power (PPA) costs decrease over the planning period.[62] These trends are consistent with the general planning strategy to replace expensive and volitily-priced fossil fuels with more economical fuels and cost-effective renewable resources.

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[60]Data for Figures 7, 8 and 9 are derived from the HECO Companies' response to PUC-IR-4, as amended November 2, 2014.

[61]The capital and equity charges are annual fixed charges associated with increasing utility ratebase, reflecting the impact of assumed capital expenditures. A minor increment of revenue taxes associated with fuel and purchased power costs is included in the capital charges as reported in the information request response upon which the chart was derived.

[62]Fuel and PPA charges include the cost of fuel for HECO Company-owned generators, plus fuel and fixed costs of power purchased by contract from both fossil-fueled and renewable generation suppliers.

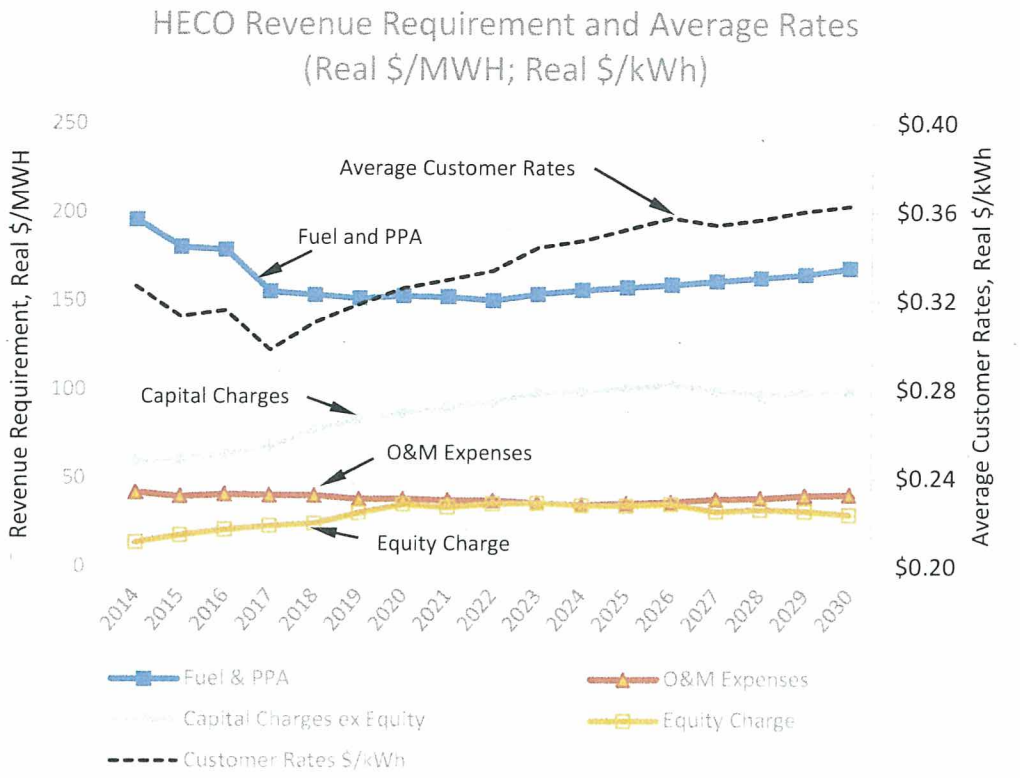

Figure 7: HECO Revenue Requirement Components and Average Rates

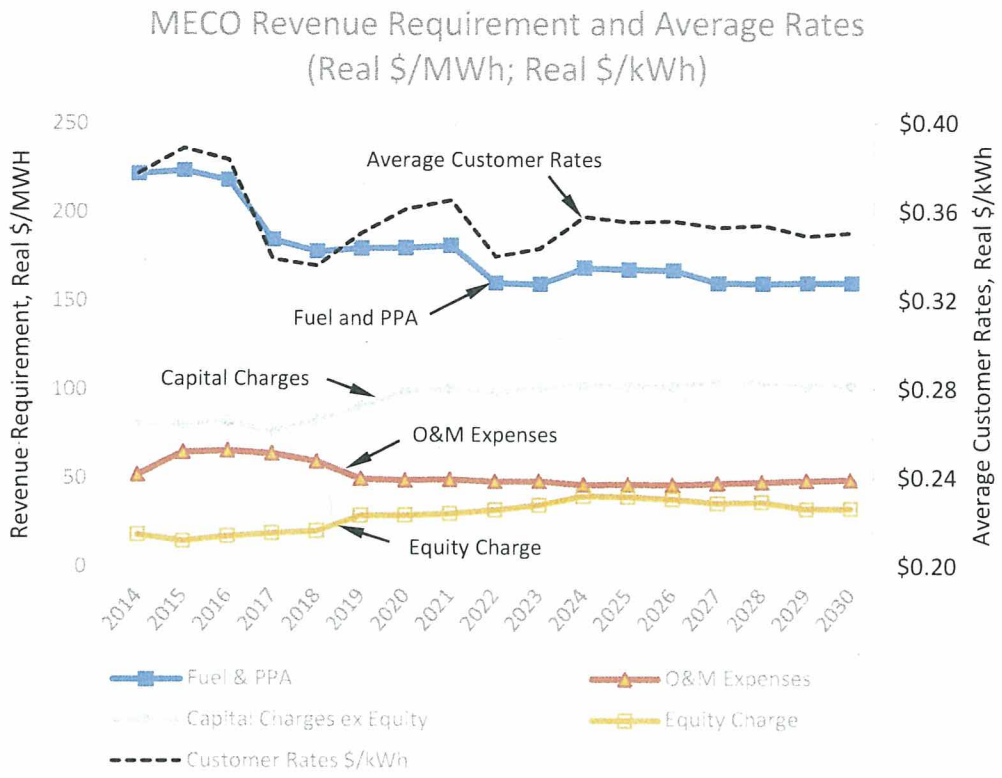

Figure 8: MECO Revenue Requirement Components and Average Rates

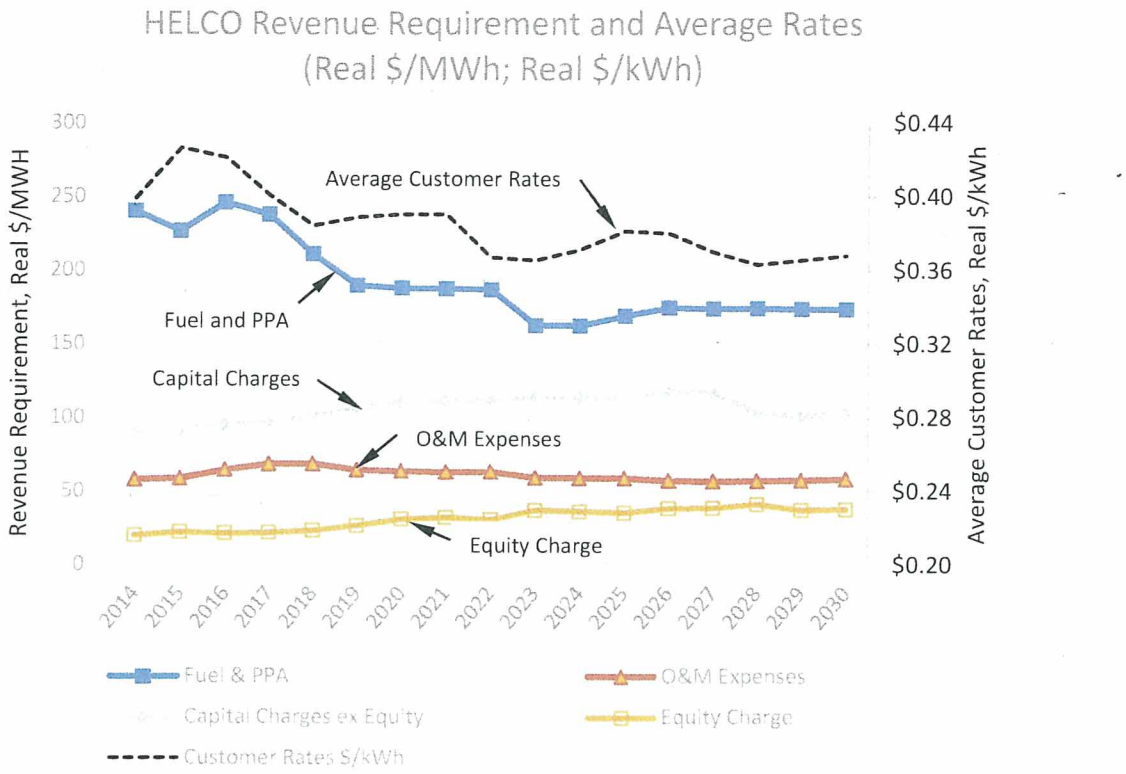

Figure 9: HELCO Revenue Requirement Components and Average Rates

As shown in Figures 7, 8, and 9, the predominant reductions in customer rates in the Preferred Plans would occur as a result of decreased fuel costs when LNG fuels are introduced to replace petroleum fuels. This would occur in 2017 for HECO, 2017 and 2022 for MECO, and 2017 to 2018 for HELCO. The cost savings from utilization of LNG are the primary apparent downward influence on costs and rates that balance the upward trends of capital-related expenses.[63] Without the cost savings provided by

[63]Operation and maintanence expenses (O&M Expenses), which include remaining costs not included in fuel, PPA,

the assumed timing and net benefits of LNG utilization, the capital expenditures in the Preferred Plans would be the most apparent and predominant drivers of increasing costs and rates.

The commission is concerned that the implicit "deal" in the Preferred Plans appears to favor the financial interests of the HECO Companies while providing less prominent and less certain benefits serving the interests of its customers. The Companies' earnings on equity associated with the PSIP capital investment plan would increase by a factor of 2.3 times over the planning period,[64] whereas customer rates, in real terms, would increase (for HECO) or decrease modestly (for MECO and HELCO). The predominant portion of the capital spending in these plans occurs in the first few years (2015-2022), and the HECO Companies will earn a certain, fairly immediate return on these investments after the projects are placed in service. By contrast, under the proposed plans, projected customer bill savings would be more modest, substantially more uncertain, and deferred until later in the planning periods.

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capital and equity charges, do not change significantly in real terms by the end of the planning period.

[64]Derived from HECO Companies' response to PUC/HECO-IR-4(c). Earnings on the equity portion of ratebase for HECO, for example, would increase from $94 million in 2014 to $220 million in 2030 (amounts rounded).

The commission is well aware that the major initiatives to modernize the grid and integrate higher levels of renewables will require significant capital expenditure. However, the HECO Companies have not provided convincing evidence that the nature, timing and magnitude of proposed capital expenditures are optimal or reasonable.

d.

Summary

In reviewing the overall costs and rate impact of the PSIP Preferred Plans, the commission is concerned that the Companies' plans appear to incur extensive, near-term capital spending with only limited projected customer bill savings that would occur later in the planning period than necessary and would be subject to several uncertainties. For MECO and HELCO in particular, the potential benefits to customers may be less certain and timely than the Preferred Plans indicate. The plans depend on substantial cost savings from near-term LNG deliveries and the development of geothermal plants in the latter half of the planning periods.

The commission does note that the rate impacts estimated in the PSIP Preferred Plans are an improvement on the rate impacts under the IRP Action Plans that were rejected by the commission in

Docket No. 2012-0036. However, the commission is not convinced at this stage of the proceeding that the PSIP Preferred Plans represent the most reasonable course of action. From the commission's preliminary review, it appears that there may be alternative strategies that can deliver more certain and timely benefits to customers. The commission is interested in alternative proposals from the HECO Companies and other Parties that can provide more certain savings to customers more promptly.

Given these concerns and the information supplied to date, it is clear that the Companies' PSIPs have not sufficiently identified and demonstrated Preferred Plans that would ensure reasonable and affordable costs and customer impacts.

2.

Commission Observation and Concern #2:
PSIPs Do Not Appear to Aggressively Seek Lower-Cost,
New Utility-Scale Renewable Resources

In prior guidance, the commission has stated that the HECO Companies should aggressively seek lower-cost, new utility-scale renewable resources, as appropriate, that would lower system costs and maximize use of cost-effective resources.[65] In ordering the HECO Companies to prepare PSIPs, the commission

[65]See Commission's Inclinations at 4.

required an "Optimal Renewable Energy Portfolio Plan" component to identify "the key technical, economic and geographic location parameters that delineate the optimal, least-cost, diverse portfolio of renewable energy resources"[66] and identified a number of requirements to consider the appropriate mix of resources as well as associated cost impacts and integration challenges. Based on preliminary review, the renewable portfolio plans and supporting analyses provided in the PSIPs appear to have several major shortcomings.

In public characterization of the PSIPs, the HECO Companies have proclaimed the 65% level of RPS achieved in the Preferred Plans. However, based on the information supplied in the PSIPs and responses to the commission's information requests, it appears that the claimed level of RPS attainment relies on renewable resources that have high costs relative to other renewable opportunities, occur late in the planning period (2025 and beyond) and, in some cases, have uncertain or doubtful probabilities of successful development.

The PSIPs also fail to sufficiently demonstrate that the proposed renewable resource integration measures, including the proposed BESS resources and the retirement and replacement of the

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[66]See Decision and Order No. 32053 at 99-101 (HECO) and Decision and Order No. 32055 at 88-90 (MECO).

existing generation fleet, constitute the most cost-effective strategy considering potential alternatives. Based on preliminary review of currently filed information, it appears that the HECO Companies have not demonstrated that the "Preferred Plans" appropriately maximize cost-effective renewable energy sources and represent well-reasoned strategies that would lower system costs and maximize the use of cost-effective resources. The commission's observations and concerns regarding the portfolio of renewable energy resources selected for each Preferred Plan are discussed below.

a.

Plans Do Not Appear To
Maximize Use of Cost-Effective Renewables

Based on review of the information available, the commission is concerned that the Preferred Plans do not appear to maximize the lowest-cost renewable resources on each island, and do not implement these resources as promptly as appears possible and most beneficial.

In each Company's PSIP, the commission observes a similar pattern of extensive new investment in flexible

fossil-fueled generation[67] and grid-stabilizing resources, which are presumably intended to support further integration of variable renewable resources. Yet, in each case, only a limited amount of low-cost new renewable generation is promptly added after these investments, despite the fact that the renewable technologies considered by the HECO Companies are assumed to be currently and increasingly cost-effective.

It is not sufficiently demonstrated in the PSIPs why more low-cost renewable generation resources are not included or implemented more promptly in the Preferred Plans. The Companies have not demonstrated that the proposed renewable portfolios meet the commission's expectations to "accommodate large amounts of variable renewable energy, reduce power supply costs and to provide significant customer rate relief"[68]

Specific observations regarding each of the Companies' island system plans are discussed below.

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[67]One component of new flexible generation, the Schofield Generating Station on Oahu, is assumed to utilize at least some fraction of renewable fuels.

[68]Decision and Order No. 32053 at 104.

HECO

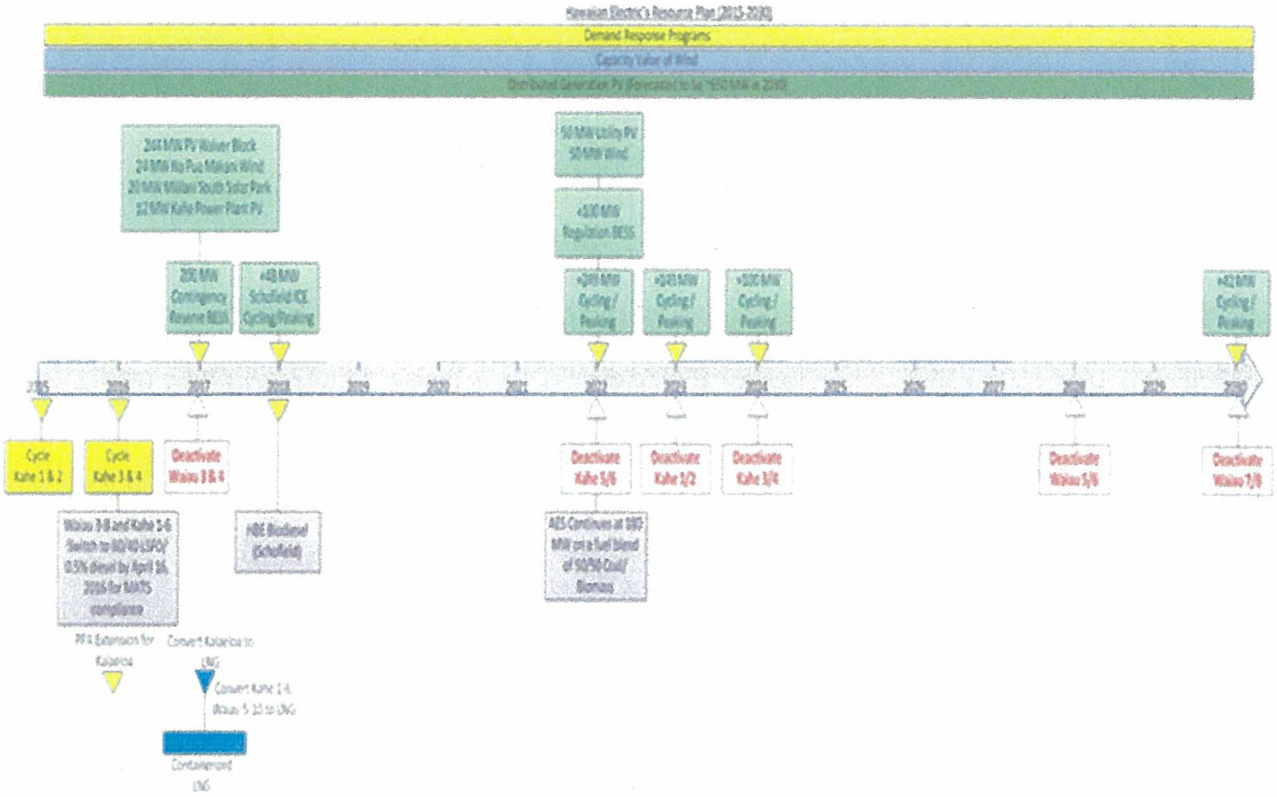

Figure 10: HECO Preferred Plan

Figure 10 shows details of the HECO system Preferred Plan. The chart shows that a significant amount of new firm generation resources would be added between 2018 and 2024 (approximately 550 MW) in addition to 300 MW of new storage resources. Despite these extensive new investments to improve the flexibility of the Oahu system, the preferred plan would add only a limited amount of renewable resources, such as utility-scale wind and solar PV, which appear be more economical than the fossil generation costs assumed in the Preferred Plans. Instead, the Preferred Plans include conversion of the AES coal plant to

utilize a fifty percent mix of coal and biomass fuels, which appears to have higher costs.

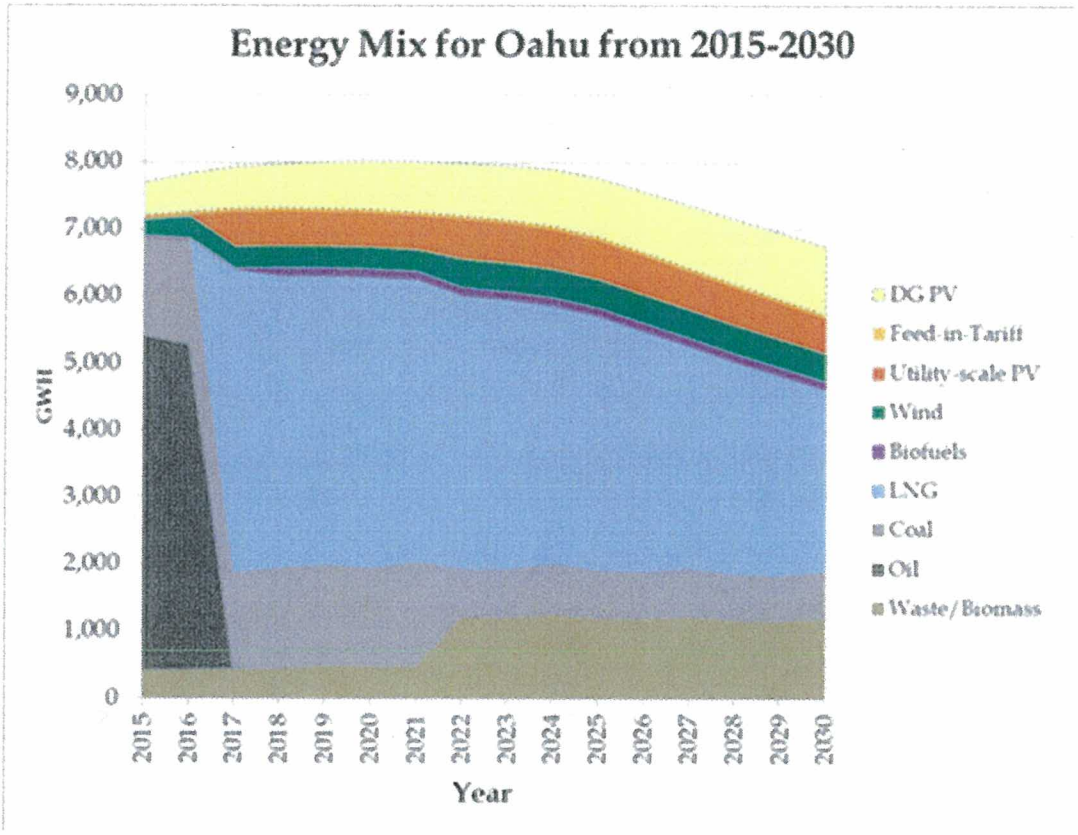

Figure 11: Energy Mix, HECO Preferred Plan

Figure 11 depicts the annual energy mix on Oahu that would result from implementation of the Preferred Plan. The chart shows the conversion of oil-fueled generators to utilize LNG and the addition of utility-scale PV projects in 2017[69]. The next

[69]The utility-scale PV projects projected to be added in 2017 were under consideration by HECO prior to the development of the PSIPs.

major changes occur in 2022 with the addition of some utility-scale wind and solar PV resources along with a shift to co-fire fifty percent biomass fuel at the AES coal plant. Over the remaining portion of the planning period, the plan includes incremental growth in DG PV and a continued decline in overall generation resulting from reductions in energy sales.

Figure 12 displays the HECO Companies' assumptions regarding the total costs of available new resource options, expressed as levelized energy costs.[70]

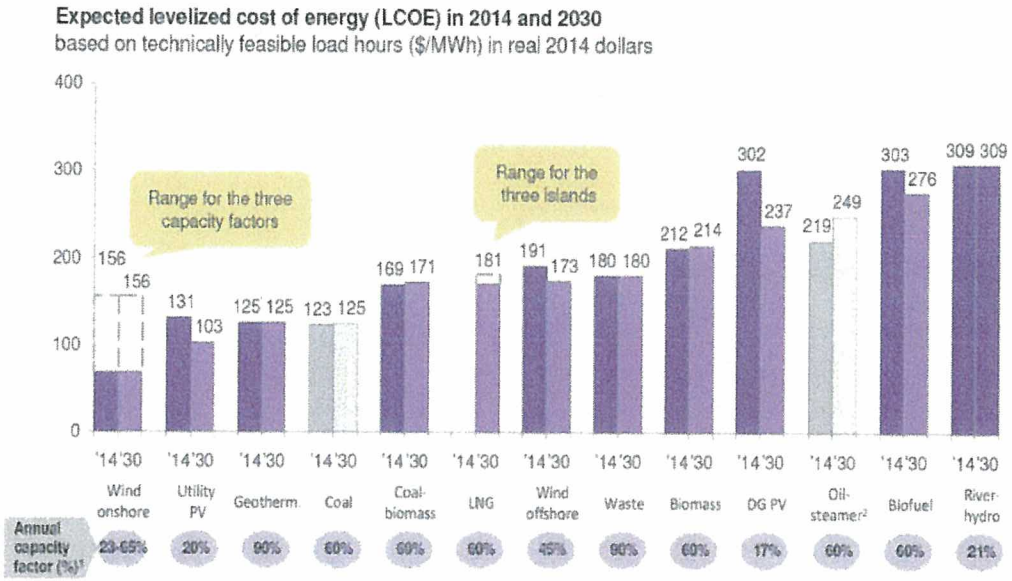

Figure 12: Levelized Costs of New Resource Options Assumed in Development of Preferred Plans

[70]Figure 12 is reproduced from HECO Companies' response to PUC-HECO-IR-15, Attachment 2 at (labeled) 3.

The chart shows that the lowest cost resources are onshore wind, utility-scale PV, and geothermal, which are lower in cost than any of the new fossil-fueled resources. The estimated costs of biomass conversion, which will be discussed in more detail below, appear considerably higher than several other available renewable energy sources.

Table 2 shows the HECO Companies' assumed constraints on the amount of renewable resources considered for each island.[71]

Constrained Resource Type	Resource Constraint by Island (Incremental to Existing and Committed)		
	O'ahu	Maui	Hawai'i
Geothermal	0 MW	25 MW	50 MW
On-Shore Wind	50 MW	> 500 MW	> 500 MW
Solar PV (Utility Scale)	360 MW	> 500 MW	> 500 MW
Waste-to-Energy	0 MW	10 MW	5 MW
Pumped Storage Hydro	50 MW	120 MW	90 MW
OTEC	100 MW	0 MW	0 MW
Biomass	30 MW	0 MW	34 MW
Ocean Wave / Tidal	0 MW	0 MW	0 MW

Table 4-2. PSIP Assumed Incremental New Resource Constraints by Island

Table 2: Assumed Constraints on Renewable Generation Options

Examination of Table 2 in comparison to Figures 10 and 11 shows that higher penetrations of low-cost utility-scale solar PV

[71]Table 2 is reproduced from the HECO PSIP at 4-19.

are assumed to be available than were evidently selected in the HECO Preferred Plan.

As shown in Figure 11 above, a substantial share of the increase in renewable resources in the Preferred Plan on Oahu result from the conversion of the AES plant to utilize biomass fuels. The plan reaches the pre-determined limit for onshore wind resources on Oahu and includes a limited amount of new utility-scale PV but does not add the assumed maximum limit.[72]

In light of HECO's assumptions for projected renewable resource costs and the extent of available resources, it is not clear why the Preferred Plan does not include more lower-cost renewable resources, such as wind or utility-scale solar resources rather than the higher-cost biomass conversion of the AES coal plant. In sum, the HECO Preferred Plan does not appear to maximize the lowest-cost renewable energy sources.

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[72]As shown in Table 2 above, utility-scale PV resources were constrained in the analyses to a maximum of 360 MW for Oahu.

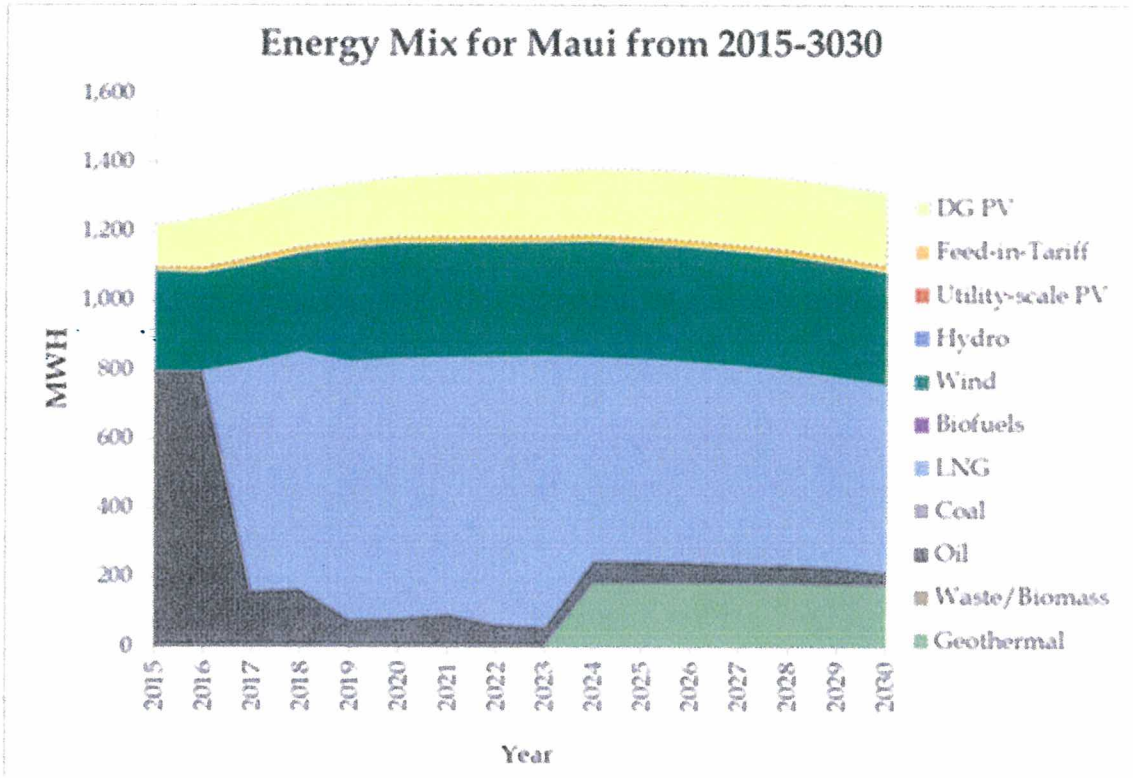

Figure 13: Energy Mix for Maui in MECO Preferred Plan

Figure 13 depicts the annual energy mix on the Island of Maui that would result from implementation of the Preferred Plan. The chart for Maui shows a trajectory similar to Oahu. Oil-fueled generators would be converted to LNG in 2017. A small increment of wind resources would be added in 2019, and the primary increase in renewable energy would occur with the assumed addition of geothermal resources in 2024. The plan assumes incremental annual growth in DG-PV over the planning period.

A comparison of the 2013 and 2030 mix of renewable energy generation shows that the addition of geothermal resources comprises most of the growth in new renewable energy in the Preferred Plan for Maui. Considering the preliminary commercial status and unproven viability of geothermal resources on Maui, it appears somewhat speculative to stake the attainment of RPS and the economics of the Preferred Plan on the presumption that new geothermal resource can be successfully developed in the assumed timeframe. With the abundant potential and commercial readiness of other low-cost renewable resources (including wind and utility-scale PV resources), the commission observes that this strategy would have MECO wait until late in the planning period to rely on acquisition of an unproven geothermal resource. It would appear that earlier installation of other well-proven lower-cost resources could result in a cleaner and lower-cost energy supply.

The preferred plans for Molokai and Lanai are nearly identical despite the differences in the existing resources and customer base on each island.[73] With the limited information provided, the basis for selecting the preferred resources is not clear. Moreover, the Companies have not demonstrated that the

[73]The preferred plans for Molokai and Lanai are shown in the MECO PSIP at ES-7 and ES-8.

resources added in the Preferred Plan are appropriate and consistent with the existing assets on each island and prospective projects contemplated by other entities.[74]

The HECO Companies have not provided supporting information to evaluate the impact of the Preferred Plans on Molokai and Lanai customers. Finally, with the passage of the new RPS goals for the State of Hawaii, the commission notes that the smaller size of the Molokai and Lanai island systems could provide an opportunity for the Companies to work with these island communities to determine an affordable plan to reach 100% renewable systems.

[74]The commission is aware that there is a battery energy storage project planned for the Molokai system by the Hawaii Natural Energy Institute. Lanai has an existing solar PV installation with a battery energy storage system. Pulama Lanai has announced plans for major grid modernization investments. It is not clear whether or how the Companies have integrated these projects into the Preferred Plans.

HELCO

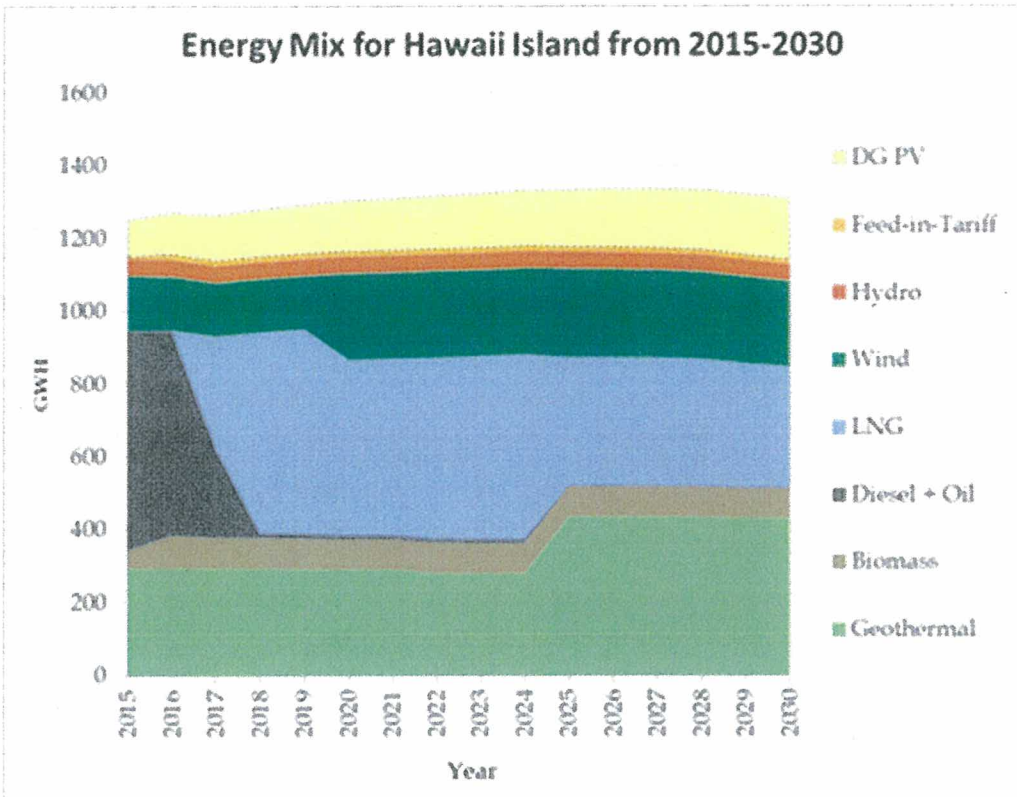

Figure 14: Energy Mix for HELCO Preferred Plan

Figure 16 depicts the annual energy mix on the Hawaii Island system that would a result from implementation of the Preferred Plan. The Preferred Plan on Hawaii Island follows a pattern similar to Maui. Oil-fueled generation is replaced with LNG in 2018, followed by additions of wind in 2020 and geothermal in 2025. This allows HELCO to reach the highest percentage of renewable resources of the HECO Companies. However, as discussed above with respect to the other islands, based on the information provided, it appears that there are further opportunities to

achieve higher penetrations of low-cost renewable resources earlier in the planning period.

Figure 16 shows the Companies' assumptions that geothermal, utility-scale solar, and wind resources are the three lowest-cost generation resources, and are lower in cost than LNG or oil-fired generation alternatives. The PSIPs do not demonstrate why the Preferred Plan does not utilize these lower cost resources earlier and to a greater extent in order to deliver additional customer savings.

Overall, the HECO Companies have not demonstrated that the renewable energy portfolios in the Preferred Plans are the most appropriate mixes of variable and firm renewable energy resources. Nor have the Companies complied sufficiently with several of the requirements laid out by the commission in the initial framing of Optimal Renewable Energy Portfolio Plan component of the PSIPs. In Order No. 32053, among other provisions, the commission provided that:

> [T]he Optimal Renewable Energy Portfolio Plan shall, at a minimum, analyze the following:
>
> i. Appropriate mix of variable and firm renewable energy resources;
>
> ii. Appropriate mix of solar PV resources versus other, higher capacity factor renewable energy resources;
>
> . . .

v. Cost and ratepayer impacts that result from full attainment of renewable energy portfolio standards (RPS) and also include a comparison of full attainment of the RPS with various levels of exceeding the RPS.[75]

The HECO Companies need to supplement and, as necessary, amend the PSIPs and supporting analyses to appropriately address the directives provided by the commission in Decision and Order No. 32053.

b.

Claimed 65% Renewable Achievement in the PSIPs Relies on High-Cost and Uncertain Resources

The HECO Companies have widely publicized the 65% attainment of renewable energy generation in the Proposed Plans. This result, however, appears to rely on the utilization of renewable resources with relatively high costs and unproven resources with uncertain feasibility.

The HECO Preferred Plan includes a conversion of the AES coal plant to utilize 50% biomass fuel, despite the potentially high cost of this option relative to other renewable opportunities.[76] Furthermore, it is not apparent that AES has

[75]Decision and Order No. 32053 at 100.

[76]Based on information provided by the Companies in PUC-HECO-IR-21 and PUC-HECO-IR-22, utilization of a fifty percent

contemplated a fuel switch of this magnitude, nor has the feasibility of importing the assumed volume of biomass been made clear.[77] In discussing this resource option, the HECO PSIP states:

> AES is the single largest generating unit on the Oahu power system at 180 MW. It currently operates on 100% coal and provides no contribution to RPS. During the course of the PSIP analyses, consideration was given to limit the output to 90 MW for system reliability and/or to convert the operation from coal to biomass. In the Preferred Plan, AES is retained at 180 MW and operated at a blend of 50% biomass and 50% coal from 2022. This did not appear to be the most economical choice, but from a planning perspective it provides the greatest optionality and a very significant contribution to RPS. Depending on what coal and biomass prices turn out to be, and depending on the need for RPS or lower cost, we will have the optionality to adjust operations at any time in the best interests of our customers.[78]

Based on the characterization in the PSIP, it is not clear whether the selection of this resource was the result of a rigorous economic analysis or the result of the optimization planning that was conducted as part of the "clean slate" analysis. The analytical basis for including conversion of the AES facility

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mix of biofuel in the AES unit would appear to result in additional annual fuel costs of $78 million (nominal) in the first year of assumed utilization (2022).

[77]See letter for AES Hawaii, Inc., filed in this docket on October 6, 2014 at 3-4.

[78]HECO PSIP at 5-9.

to 50% biomass fuel instead of increased utilization of other renewable development options is not explained or supported in the HECO PSIP, yet this individual resource comprises the largest single source of renewable generation in the Oahu fuel mix.

The MECO Preferred Plan includes a 25 MW geothermal resource that is assumed to commence generation in 2024. In light of the fact that the viability of geothermal resources on the Island of Maui remains unproven, the large contribution towards the RPS provided by this assumed resource is substantially uncertain. Other low-cost proven renewable resources, such as wind and utility-scale solar, appear to have been displaced by a resource with uncertain feasibility.

The commission cites these two examples because they comprise significant portions of the renewable portfolios in the "Preferred Plans" for Oahu and Maui Island. Given the uncertainties and potentially high costs of these resources, the Companies need to further explain and support the basis for heavily relying on these resources in the Preferred Plans and provide any relevant contingency plans the Companies have developed to address circumstances where these resources are unavailable or not cost-effective.

c.

Assumed Technology Costs and Constraints on Renewable Resources Lack Justification and Appear Conservative

The amounts and types of renewable resources that are considered in the PSIP analyses appear to be inappropriately limited. Generally, the HECO Companies' criteria for exclusion of resource technologies from consideration in the economic analyses based on the state of commercial readiness appear over-restrictive. The Companies have categorically excluded generation technologies with a Commercial Readiness Index ("CRI") lower than five. This excludes technologies with a CRI of four, which are technologies in full-scale commercial use and have "publicly verifiable data on technical and financial performance."[79]

Without explicit supporting justification, categorical exclusion of technologies with a CRI of four, such as offshore wind or solar thermal resources, appears conservative.[80] Screening criteria used by the Companies regarding commercial

[79]See Appendix H of the PSIP of each Company.

[80]The commission observes that Hawaii's electric utilities are actively investigating and considering advanced solar inverter technologies that arguably have a lower commercial readiness status equivalent to CRI three.

readiness should not preclude appropriate consideration of resources that could substantially contribute to a cost effective resource mix.

In addition, it appears the HECO Companies have made unsubstantiated limiting assumptions constraining the available amounts of key renewable resources. These include constraints on Oahu for onshore wind and utility-scale solar resources. The constraint on geothermal resources on Hawaii Island also appears potentially limiting. With constraining assumptions for some of the lowest-cost renewable resources, the Preferred Plans appear to incorporate higher-cost renewables or limit the overall penetration of renewables. Based on the significant impact of these assumptions on the Preferred Plans, the basis for the constraining assumptions requires further justification and documentation.

Furthermore, the technology cost assumptions utilized by the HECO Companies in the PSIPs also appear conservative. According to the HECO Companies, the base technology cost inputs were derived from a 2009 report prepared by Black and Veatch five years before the PSIPs were developed.[81] In some cases, these base assumptions from 2009 were increased to account for locational

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[81]See HECO PSIP at F-13; MECO PSIP at F-14; HELCO PSIP at F-13.

differences, and then raised further by applying a "utility adjustment factor," which is not fully explained.[82]

Based on these assumptions and methodology, the cost assumptions do not appear to accurately reflect current cost trends and would appear highly conservative further into the future. For example, according to the HECO Companies, the assumed levelized cost of residential PV in 2030 is approximately 23.7 cents per kWh, which is substantially higher than estimates of the typical levelized cost of residential PV in 2015.[83] Between 2009, when the cost assumptions were developed, and 2014, when the HECO Companies prepared the PSIPs, the cost of many renewable energy technologies declined substantially.[84] Cost declines have continued, with proposed PPA prices for utility-scale PV in Hawaii today roughly equivalent to the assumed cost of utility-scale PV

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[82] See HECO PSIP at F-13 to F-22; MECO PSIP at F-14 to F-21; HELCO PSIP at F-13 to F-22.

[83] In Docket No. 2014-0192, the Consumer Advocate and DBEDT provided estimates that the levelized installed cost of residential solar in Hawaii, including available tax credits, is about 10 cents per kWh (excluding tax credits, the installation cost is estimated to be 20 cents per kWh). See Consumer Advocate Preliminary Statement of Position, filed June 1, 2015. See also DBEDT Final Statement of Position, filed June 29, 2015.

[84] See, e.g., Photovoltaic System Pricing Trends. Historical, Recent, and Near-Term Projections 2014 Edition. Available at: http://www.nrel.gov/docs/fy14osti/62558.pdf.

in 2030 in the PSIPs.[85] Based on a preliminary review of the information presented to date, the HECO Companies do not appear to have utilized the most current technology cost assumptions for the PSIPs, and, as part the supplementation and amendment of the PSIPs in this proceeding, the technology cost assumptions must be reviewed, updated, and substantiated to more accurately characterize current and projected technology costs.

d.

Costs to Integrate Renewable Resources
Are Not Clearly Addressed

Maximization of cost effective renewable energy resources must include analysis and determination of a reasonable mix of resource types in conjunction with and considering the nature and costs of measures necessary to integrate the renewable resources on the utility systems.

For these reasons, the commission explicitly directed the HECO Companies to analyze the costs to integrate different levels, mixes and locations of renewable energy technologies in

[85]See Docket Nos. 2015-0224 and 2015-0225. See also, Nevada Power Company's Application for Approval of Purchased Power Agreements with SunPower and First Solar at 2, available at http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS 2015 THRU PRESENT/2015-7/3615.pdf.

the "Optimal Renewable Energy Portfolio Plan."[86] Based on preliminary review of the PSIPs, the commission observes that the necessary ancillary services and costs of integrating variable-output renewable generation resources, including the costs of resources required to provide necessary ancillary services, and the needs and costs of modifications to utility system operations, have not been explicitly identified.[87]

Renewable energy integration challenges are, in nature, cost and magnitude, specific to the types and amounts of different renewable energy resources planned for each island grid. This is recognized in the PSIP analyses by quantification of regulation requirements associated with wind and PV resources.[88] In determining an optimal mix of resources it is necessary to consider the integration costs associated with the specific resource options. The commission recognizes that some of these integration costs have been incorporated in the PSIP modeling

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[86]Item iv. in the Optimal Portfolio Plan directs the HECO Companies to analyze, "Costs and technical challenges, including reserve margins, ancillary services and generation unit upgrades or replacements required, to integrate different levels, mixes and locations of renewable energy technologies."

[87]The analysis of ancillary services in the PSIPs is discussed further in Section VI.F, below.

[88]See "System Security Requirements" in Section 4, and "Major Planning Assumptions" in each of the Companies' PSIPs.

analyses to a greater extent and more accurately than the 2013 IRP analyses. However, it is not clear that the costs of integrating variable renewable generation resources on the utility systems have been explicitly and adequately taken into consideration in the determination, selection, and maximization of cost effective renewable resources.

For example, it has not been sufficiently demonstrated that the renewable integration measures proposed, including the BESS resources and the retirement and replacement of the existing generation fleet in conjunction with the proposed portfolios of renewable generation resources, constitute the most cost-effective strategy considering potential alternatives.

Generally, it is not clear whether or to what extent the determination of best resource mix directly and appropriately considers the amount of necessary system integration costs, including any energy storage, demand response or system operation measures to provide necessary ancillary services associated specifically with each resource mix. This topic will be addressed further under Observation and Concern #6.

e.

Summary

After preliminary review of the submitted information, it has not been clearly demonstrated that the proposed renewable energy portfolios in the "Preferred Plans" represent a reasonable, cost-effective strategy to meet state energy policy objectives. The HECO Companies appear to have included resources with higher-costs and uncertain feasibility (e.g., AES biomass conversion on Oahu, geothermal resources on Maui) at the expense of other lower-cost renewable sources that could be developed sooner and with lower development risk. Furthermore, the Companies appear to have deferred further renewable resource development to the later portion of the planning period, a substantial time after investing significant amounts of capital to retire and replace nearly the entire thermal generation fleet on each island.

The HECO Companies have not convincingly demonstrated that the proposed renewable portfolios in the Preferred Plans represent the best, most reasonable plans. The Commission will require further clarification from the HECO Companies, and supplemental analysis where necessary. Furthermore, the commission encourages the Parties to offer alternative resource development plans, particularly when they show options that can deliver more certain benefits to customers sooner.

3.

Commission Observation and Concern #3:
PSIPs Do Not Adequately Address Utilization
and Integration of Distributed Energy Resources ("DER")

The HECO Companies have highlighted that the Preferred Plans would "[n]early triple the amount of distributed generation ("DG"), such as rooftop solar" as one of the key features of the PSIPs. It does not appear, however, that the Companies have adequately characterized and considered the likely future opportunities for all distributed energy resources, including demand response, energy efficiency, electric vehicles, distributed generation, and distributed energy storage.

The commission supports a strong commitment to enabling further future growth in customer-sited resources. The proposed plans, however, fall short of the guidance to "Harness Distributed Energy Resources (DER) to Benefit System and Customer" that was articulated in the Commission's Inclinations.[89]

Based on preliminary review of the supporting material submitted in response to commission information requests, it appears that the HECO Companies' analyses assume that distributed resources through 2030 would have little or no role in contributing to system needs beyond supplying energy during

[89]See Commission's Inclinations at 15-16.

sunshine hours in the middle of the day. More specifically, the supporting analyses do not appear to contemplate, to any significant extent, the use of distributed energy resources in the "smart homes" and "smart businesses" of the future that can supply high-value grid services or offset future transmission-and-distribution infrastructure upgrades, or that these customer energy solutions could provide grid services at lower incremental cost than traditional grid upgrades.

Based on examination of the assumed daily profile of energy supplied from generation resources on each utility system, it appears that the HECO Companies' analyses assume that future distributed resources will continue to be developed and operated in a manner similar to resources that are in use today, despite the significant changes in energy supply and grid operations that are anticipated with the growth of renewable resources in each Preferred Plan.

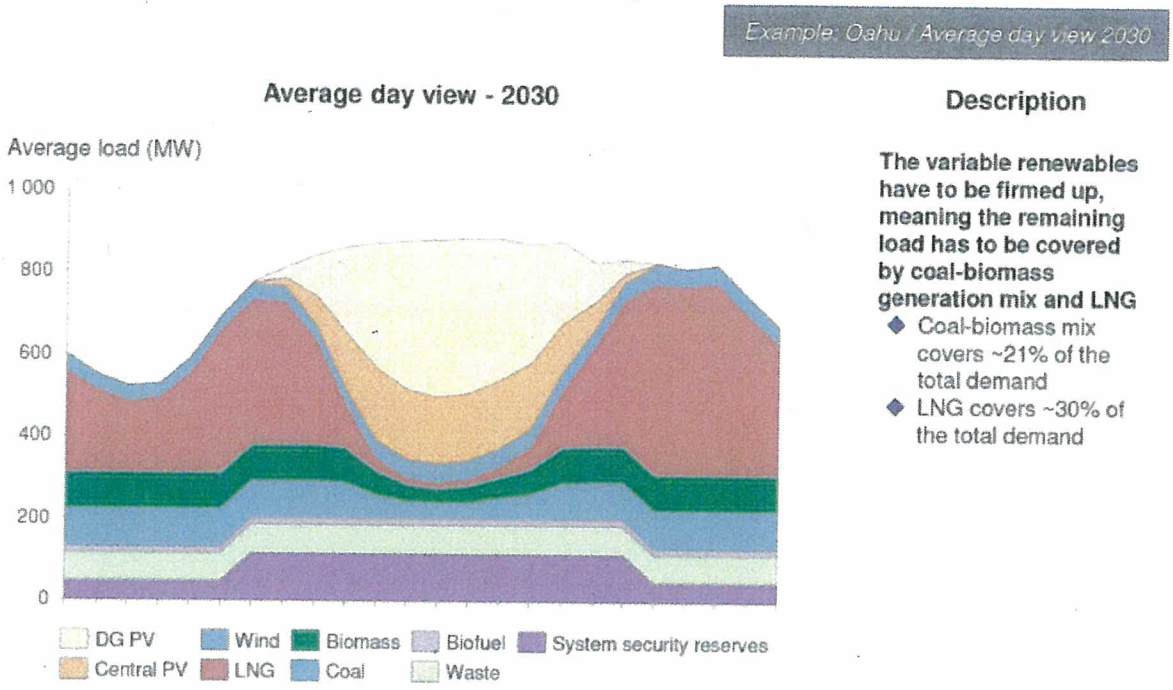

Figure 15: Average Day Generation Profile for HECO Preferred Plan in Year 2030

Figure 17 illustrates some of the projected changes in system operations under the HECO Preferred Plan, showing an "Average day view" for the year 2030.[90] The graph shows that "DG PV" and "Central PV" resources produce over half of the power during the midday hours, which requires other sources of generation to decrease output or cycle offline during these periods. Online system security reserve capability would have to decrease

[90]Figure 17 is reproduced from HECO Companies' response to PUC-HECO-IR-15, Attachment 2 at (labeled) 26.

at the same time that system security reserve requirements would increase.[91]

The commission makes several observations about system operational challenges with significant additions of variable renewable generation beyond what is assumed in the Preferred Plans. During periods of maximum solar output, further additions of energy from any renewable source would appear to increase curtailment of renewable sources unless one or more of the following occurs: (1) utilizing energy storage to shift generated energy into another time period; (2) increasing demand or shifting demand from other periods; or (3) further reducing online system security reserves.

The commission previously raised similar concerns in Order No. 32053, and repeats them here to highlight the need for considering new strategies for DER development that will allow increased installations of customer-sited resources that contribute to the needs of the grid. These new development strategies are under consideration in the DER Docket and anticipate future DER systems that can utilize customer load management, energy storage, and other control systems to utilize

[91]Necessary system reserves would be expected to increase with increased amounts of generation being provided by variable renewable generation.

customer-sited resources to meet on-site load and utility system security requirements, and reduce the amount of power exported to the grid during the peak solar periods.

It is also not apparent from the provided information that the Companies have clearly identified all of the costs for integration of renewable resources and attempted to minimize these costs. The HECO Companies' analyses have generally assumed that customer-sited resources, including demand response resources, can meet little or none of the "system security requirements" under the circumstances shown in Figure 17, above. This is important because assuming that these system security requirements can only be supplied by conventional generation resources requires maintaining an excessive minimum level of generation online (shown in bottom portion of the chart in Figure 17) and reduces the capacity to integrate additional generation. Furthermore, the proposed investments in new utility-owned assets to meet these requirements constitute a significant portion of the proposed capital expenditures in the PSIPs.

The planning analyses have assumed some level of load shifting through time-of-use rates and limited development of electric vehicles. However, given the integration challenges illustrated in Figure 17, it would appear that the plans need to more aggressively pursue solutions that can further enable

customer energy choices, contribute to further integration of renewable energy, and reduce system expenses and capital expenditures.

The commission does note that the HECO Companies do appear to have made some progress in this area since submitting the PSIPs. The Companies have reduced the backlog of interconnection requests and have proposed new options to address some of these challenges, including: a tariff to enable customer-sited storage; a limited time-of-use pilot; a more expansive program to install electric vehicle charging infrastructure; and more substantial efforts to implement demand response programs. However, based on preliminary review, DER, including opportunities to upgrade/retrofit existing DER systems to provide grid services, appears to be excluded from the overall optimization of the systems in developing the Preferred Plans in the PSIPs.

The table shown in Figure 18 was submitted by the HECO Companies describing the optimization process supporting the development of the PSIPs.[92]

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[92]Figure 18 is reproduced from HECO Companies' response to PUC-HECO-IR-15, Attachment 2 at (labeled) 11. Although marked "Privileged and Confidential Work Product" this attachment was provided by the HECO Companies as a publicly accessible document.

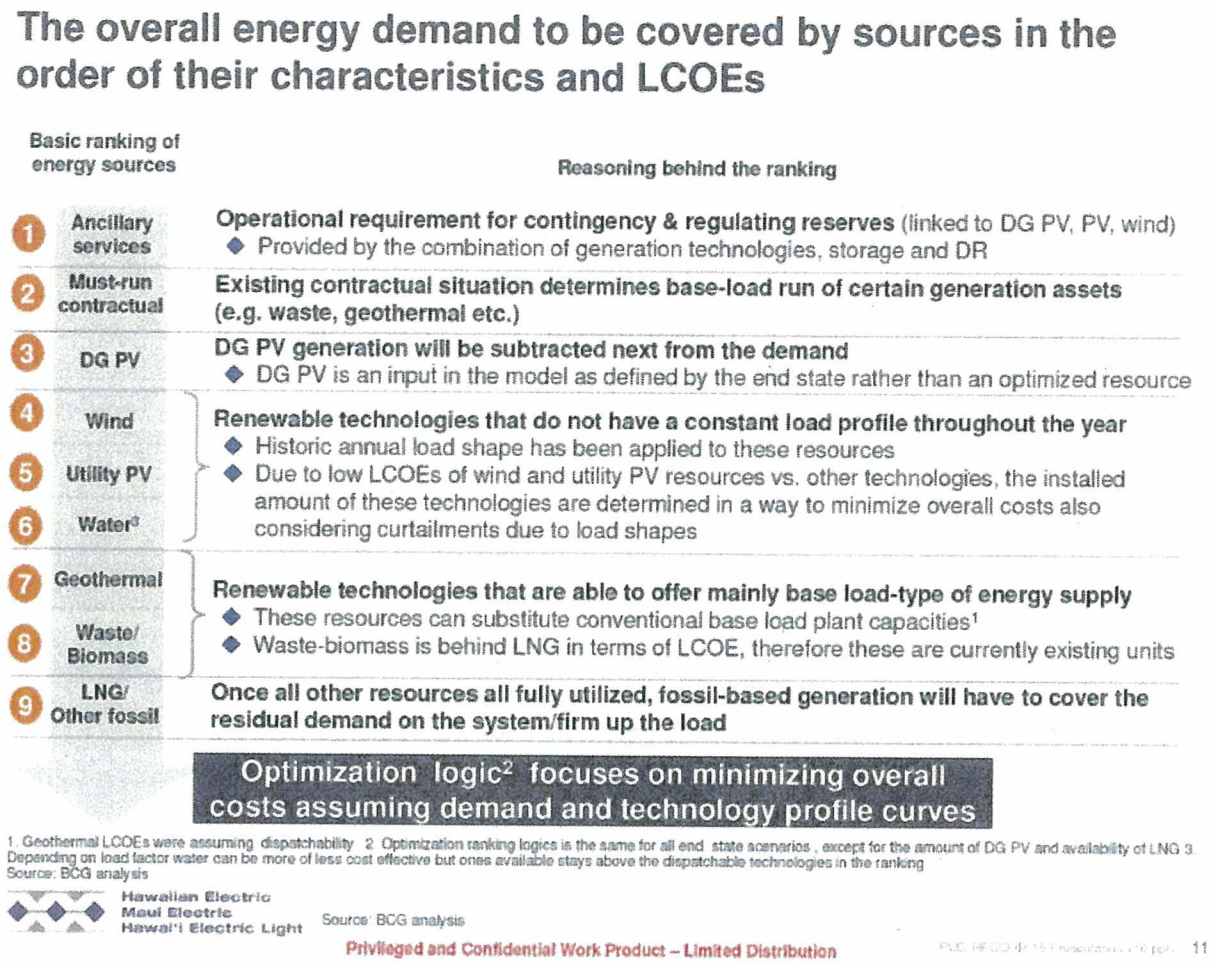

Figure 16: Ranking Sequence of Resources in Planning Analyses

Based on reviewing the information supplied by the HECO Companies, it appears the analysis projected future growth in DG based on a market demand model that utilizes the "DG 2.0" tariff revisions.[93] The capacity and profile of energy supplied from

[93]The HECO Companies describe a "DG 2.0" proposal in the PSIPs. In Docket No. 2014-0192 ("DER Docket"), the commission is investigating the technical, economic, policy and rate design issues related to DER technologies and is addressing proposed potential tariff revisions. The commission clarifies that the

these systems is assumed to be subtracted from the gross load forecast. Based on the statement that "optimization logic focuses on minimizing overall costs assuming demand and technology profile curves," it appears the HECO Companies then utilized an optimization routine to determine the resource configuration to meet the remaining net demand.

The Commission is concerned that this approach, "treating DG PV as an end state rather than an optimized resource," may be appropriate for relatively low levels of DG but is problematic given today's substantial and increasing projected DG penetrations. The Companies' analytical approach does not provide information regarding the cost-effectiveness or reasonableness of various possible amounts of DG implementation and does not consider the integration costs or system security benefits associated with various DG implementation options. By excluding DER technologies from consideration in the potential solution sets examined by the system integration analyses, there is no assurance that the DG strategies in the Preferred Plans are optimal, reasonable or cost-effective.

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instant docket examining the PSIPs will focus on the optimal utilization and system impacts of the full spectrum of DER resources. Other aspects of DER tariff proposals will be addressed in the DER Docket.

Moving forward with the review and supplement of the PSIPs, the HECO Companies need to further consider how the potential contributions and impacts of recently available customer-sited technologies, such as technologies currently being considered in the DER Docket (including advanced inverters, battery energy storage, DER aggregation, thermal storage, electric vehicle charge timing and load management systems) could significantly reduce integration costs, potentially enabling a higher penetration of renewable and distributed resources than what was assumed in the Preferred Plans. The benefits of various penetrations of these technologies should be identified and examined in the analysis of system ancillary service needs and energy producing resources in the utility resource planning analyses.

4.

Commission Observation and Concern #4:
Proposed Plans for Fossil-Fueled Power Plants
Are Not Sufficiently Justified

In the Commission's Inclinations, the commission stated that the HECO Companies should consider modernizing the generation system to achieve a future with high penetrations of renewable resources, and provided guidance to invest in grid flexibility and

pursue cost-effective retirements expeditiously.[94] In the PSIP Preferred Plans, the HECO Companies have proposed a massive restructuring of the Companies' fossil generation fleets at considerable cost. However, based on preliminary review of the provided information, the HECO Companies have not convincingly demonstrated, or even submitted information that could demonstrate, that the proposed plans for each island's generation fleet are the most cost-effective option.

As discussed in the subsections below, the HECO Companies must supplement the analysis and make amendments, as appropriate, regarding the timing and justification for the proposed retirement and replacement of the existing fossil-fuel generation fleet; enhancement of the operational flexibility of existing fossil-fueled generating units; the feasibility and cost-effectiveness of conversion of existing generation units to utilize LNG fuels; and clearly identified protocols for commitment and dispatch of generation using higher-cost renewable fuels.

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[94]See Commission's Inclinations at 6-7: *"Modernize the Generation System to Achieve a Future with High Penetrations of Renewable Resources"*; and Decision and Order No. 32053 at 92-93 requiring a "Fossil Generation Retirement Plan" PSIP component.

a.

Fossil Generation Retirement Plan
Has Not Been Adequately Justified

In specifying the required components of the HECO PSIP, Decision and Order No. 32053 requires a "Fossil Generation Retirement Plan" which, at a minimum is required to consider:

i. An analysis of the potential roles each HECO fossil generating unit should perform in the future;

ii. An analysis of future fuel expenses, operation and maintenance expenses, and capital expenditures that would be avoided if each existing fossil generating unit were to be retired;

iii. The impact each retirement, without replacement, would have on adequacy of power supply and reserve margins under existing capacity planning criteria;

iv. An analysis of how the capacity value of solar, wind, energy storage, and demand response resources will be factored into the determination of the adequacy of power supply;

V. An analysis of feasibility of utilizing existing power plant sites to locate new, quick-start, fuel-efficient, flexible generation, to leverage existing site transmission and fuel supply infrastructure capacity that would be freed-up by retirements of existing generating units;

vi. A discussion of the action plans, including costs, schedules and ratepayer impacts, to implement the Fossil Generation Retirement Plan, or a detailed

explanation of why such actions are not feasible.[95]

The PSIPs do not appear to sufficiently comply with the requirements laid out in Decision and Order No. 32053. In particular, discussion of the action plans, costs, schedules and ratepayer impacts as required in part vi, quoted above, appears to be incomplete and deficient. The PSIPs need to more adequately demonstrate the feasibility and cost-effectiveness of the proposed retirements and replacements considering available alternatives and considering updated information and assumptions.[96]

The proposed retirements of existing fossil-fueled resources and replacement with new generating units in the PSIP Preferred Plans have not been sufficiently demonstrated to be reasonable and cost-effective. For example, it is not clear why new, ostensibly flexible, generation units designed to accommodate variable renewable generation resources are added to the HECO system so many years after the variable resources are added to the utility systems. It is not clear whether utilization of additional less expensive renewable resources could not be

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[95]Decision and Order No. 32053 at 92-93.

[96]The requirements for the Fossil Generation Retirement Plan were provided in Decision and Order No. 32053 pertaining to the HECO PSIP. The commission clarifies here, that a similarly compliant plan should be provided for each of the HECO Companies.

implemented earlier or whether this would require advanced retirement and replacement of older fossil-fueled resources. Further investigation and analysis of the issues and trade-offs associated with the schedule for generation resource retirement is necessary.

More generally, the presumption that the complete retirement and partial replacement of existing fossil-fueled resources in conjunction with high ultimate penetrations of renewable generation resources is a cost-effective overall strategy should be further examined and demonstrated in this proceeding, with a focus on quantifying the potential benefits, including improved efficiency and generation flexibility, expected to be realized from new generation resources.

b.

Operational Flexibility Upgrades

In order to accommodate increased renewable energy without significant curtailment, the HECO Companies plan to make investments to increase the operational flexibility of existing generation units by converting baseload units to cycling duty, expanding the unit turndown range (which allows lower minimum

loads), and enhancing unit ramp rate capability.[97] For example, the HECO Companies plan to allow Kahe Units 1-4 and Waiau Units 7-8 to cycle daily. According to the Companies, testing at Kahe 3 "proved that the '90 MW' steam units are capable of daily cycling."[98] In addition, the HECO Companies expect to reduce unit minimum loads for Kahe 1-4 and Waiau 7-8 from 25 MW (gross) to 5 MW (gross), resulting in about 1 MW net output.[99] The proposed investments to enable these capabilities are projected to total more than $37 million over the planning period.[100]

If feasible, these improvements would represent a substantial performance improvement over existing capabilities, and, as noted above, the unit upgrades are fundamental to the HECO Companies' conclusion that substantial amounts of new renewable energy can be acquired and integrated without significant curtailment.[101] However, the Companies have not conclusively demonstrated that the capabilities assumed in the

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[97]See HECO PSIP at 5-12.

[98]HECO PSIP at 5-13.

[99]HECO PSIP at 5-13.

[100]HECO PSIP at K-52.

[101]See, e.g., Decision and Order No. 33037, filed July 31, 2015, in Docket No. 2014-0357, at 38-46.

PSIPs can be achieved on the proposed timelines and maintained over the long term for daily operation of the HECO steam units.

Finally, the commission observes that the Preferred Plan calls for Kahe 1-4 to be deactivated in 2023 and 2024.[102] Based on HECO's representation that these units can be operated cost-effectively at 1 MW net output, the Companies have not provided sufficient justification to demonstrate that making the substantial investments necessary to upgrade existing units, then promptly retiring and replacing all of the Kahe units with new generation is the most cost-effective option.

c.

LNG and Fuel Use Strategies

As discussed above, Figures 11, 13, and 16 show that the Preferred Plans on all islands presume an immediate switch to utilization of LNG fuel, which under the assumed fuel prices are projected to reduce fuel costs significantly. LNG would remain the primary non-renewable fuel through the remainder of the planning period. Given these proposed plans for fuel switching, LNG appears to be a fundamental element of the preferred plans on each island. Yet, the HECO Companies, in both the initial filings and responses

[102]HECO PSIP at 5-22.

to commission IRs, have provided limited supporting information regarding the plans to enable this transition.

Subsequent to the filing of the PSIPs, the HECO Companies have indicated that several of the key assumptions and timelines for transition to LNG fuels have changed[103]. Given the proposed importance of this fuel-switch strategy to the Preferred Plans, the HECO Companies need to further supplement the PSIPs with the most current fuel utilization plans and the impacts of these changes on their proposed strategies.

The changes in key assumptions appear to occur in several areas:

- Timing in the availability of LNG;
- Proposed infrastructure utilized to receive and transport LNG; and
- Relative prices of LNG to other potential fuel sources.

These areas are discussed further below.

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[103]See HECO Companies' Response to PUC-HECO-IR-1 in Docket No. 2013-0141, filed June 1, 2015, at 6.

(1)

Timing and Availability of LNG

The Preferred Plans anticipate switching nearly all oil-fueled generators to LNG by 2017-2018. Recently, however, the HECO Companies have announced a two-year delay in the potential importation of LNG.[104] Given this significant change in a fundamental element of the Preferred Plans, the HECO Companies need to provide supplemental analysis to identify likely impacts of these delays and any proposed alternatives on the Preferred Plans. The supplemental analysis shall include reassessment of whether it is cost-effective to retrofit existing fossil-fueled generation units for LNG fuel utilization.

More generally, supplemental analysis of LNG utilization options must address consideration of all additional pertinent circumstances that have changed since the PSIPs were filed, including: recent rulings by the US Supreme Court regarding MATS environmental requirements;[105] promulgation of the Clean Power Plan Final Rule;[106] the increased RPS established by Act 97 of the

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[104]Ibid.

[105]See Michigan v. Environmental Protection Agency, ___ U.S. ___, 135 S. Ct. 2699 (2015).

[106]See Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60).

2015 Hawaii Legislature ("Act 97");[107] and recent announcements by the Governor of Hawaii regarding State administration policy regarding utilization of LNG fuels for power generation.[108]

(2)

Proposed Infrastructure
Utilized To Receive and Transport LNG

A fundamental underpinning of the Preferred Plans is the supposition that potential fuel cost savings from switching to LNG will substantially offset the significant capital spending proposed in the PSIPs. The LNG fuel cost projections utilized in the plans assume that fuel cost reductions would start with

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[107]Act 97, Session Laws of Hawaii 2015: (1) increased the renewable portfolio standard from twenty-five to thirty percent of the utility's net electricity sales by December 31, 2020; (2) retained the requirement of forty percent by the end of 2030; (3) added requirements of seventy percent by the end of 2040 and one hundred percent by the end of the year 2045; and (4) added to the list of conditions under which the commission may waive applicable penalties, "Inability to acquire sufficient renewable electrical energy to meet the renewable portfolio standard goals beyond 2030 in a manner that is beneficial to Hawaii's economy in relation to comparable fossil fuel resources."

[108]See *Honolulu Advertiser*, August 25, 2015, article titled: "Ige blasts LNG as hurdle to clean energy in isles", by Kathryn Mykleseth. These comments reference the announcement by Hawaii Governor David Ige, at the Asia Pacific Resilience Innovation Summits & Expo, that his administration will actively oppose the construction of any future LNG receiving stations in Hawaii.

deliveries of LNG using "ISO-containers" and then transition to "bulk" delivery via a receiving terminal, which, under HECO's projections, would further reduce the cost of delivered LNG.

The ultimate timing and potential to successfully incorporate shipments of LNG at the assumed bulk scale is subject to numerous uncertain factors. Among other uncertainties, the HECO Companies have recently asserted that the passage of legislation will hinder the development of a bulk LNG terminal.[109] Also, as noted above, recent announcements by the Governor of Hawaii regarding State administration policy regarding utilization of LNG fuels for power generation should be considered.

Given the substantial assumed benefits of developing lower-cost bulk LNG fuel supplies to the overall cost of the Preferred Plans, the HECO Companies need to address the uncertainties and changes in circumstances regarding the timing, likelihood cost and feasibility of bulk import of LNG for use in power generation.

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[109]See Letter from G. Hirose to Commission, *PowerPoint Presentation from June 16, 2015 Technical Session*, Exhibit A at 3, filed June 19, 2015 in Docket No. 2014-0356.

(3)

Relative Prices of LNG
To Other Potential Fuel Sources

The assumed cost savings from the Preferred Plans appear highly dependent on the projected differences in future oil and LNG prices. The initial PSIP filings did not include sensitivity analyses to evaluate the impact of varying fossil fuel price forecasts. As the recent dramatic decrease in oil prices has indicated, the fuel price projections are highly uncertain. The HECO Companies need to supplement the supporting analyses to examine the possible impact of alternative projections of fossil fuel prices and price differentials on the Preferred Plans.

d.

Least-Cost Security-Constrained
Economic Dispatch Policies Are Not Sufficiently Transparent

In ordering HECO to prepare and file a PSIP, the commission directed HECO to perform a "Generation Commitment and Economic Dispatch Review"[110] that, among several

[110]See Decision and Order No. 32053 at 101. The "Generation Commitment and Economic Dispatch Review" requires the HECO Companies, "to ensure that existing generation resource allocation policies and practices yield the most fuel-efficient and cost-effective outcome given HECO's potential evolving portfolio of power supply resources." Id. at 101.

specifications, required that the Company, "Demonstrate that HECO's current unit commitment and economic dispatch policies and operational practices ensure that total fuel expense and purchased energy costs are and will continue to be minimized in the future."[111] The HECO Preferred Plan includes resources utilizing renewable fuels that have higher incremental costs than resources operated in accordance with a least-cost economic dispatch.

These resources include the proposed utilization of 50% biomass fuel at the AES coal plant and the commitment to utilize a minimum amount of biofuel at the Schofield Generating Station. HECO needs to supplement the very limited information provided regarding how the Companies would commit and dispatch higher-cost renewable-fueled resources in exception to least-cost system operations.

5.

Commission Observation and Concern #5:
System Security Requirements Appear Costly and
Are Not Sufficiently Justified

Hawaii's electric power systems are undergoing a fundamental transformation that presents unique challenges for long-term resource planning. Unlike long-term plans developed in

[111]Decision and Order No. 32053, subsection i., at 101.

the past in Hawaii, which focused in large part on providing increased capacity and energy resources to meet growing load, the HECO Companies' PSIPs (including the resource additions and associated capital expenditures identified in the preferred plans) primarily address the need to safely and reliably integrate substantial amounts of low-cost variable renewable energy resources into the state's island power systems.

Hawaii's utility systems are evolving to incorporate substantial amounts of variable renewable generation resources. The reliability and affordability of Hawaii's utility systems depend upon reasonable determinations of the measures and resources appropriate to provide the ancillary services necessary to incorporate these renewable resources while retiring and replacing older fossil-fueled generation units. As such, a central objective of the PSIPs is to identify resource plans that include a carefully evaluated mix of resources and near-term actions that, among other concerns, balance reliability and cost.

In Tables 4-4 to 4-14 in each PSIP, the HECO Companies describe an extensive set of System Security Requirements that are proposed to maintain system reliability with the growing additions of renewable energy sources.[112] After review of the documentation

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[112]System security requirements are explained in the PSIPs as follows: "Electric power grids operate in a manner that provides

supporting the new requirements, the commission has significant concerns in following three areas:

- the HECO Companies have not clearly established the technical basis for the proposed requirements and defined them in technology-neutral terms;
- the HECO Companies have not adequately demonstrated how the proposed requirements balance cost with system reliability and risk; and
- System security requirements appear to unreasonably limit utilization of and increase costs to integrate renewables.

In short, the HECO Companies have not demonstrated that the proposed requirements are a reasonable, cost-effective set of requirements to balance system reliability, affordability, and the integration of further clean energy sources. The HECO Companies have the burden of proof to establish that the proposed system security requirements are reasonable and in the public interest. The following sections more fully describe each concern.

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reliable and secure power during both normal conditions and through reasonably anticipated events. To achieve this reliable and secure operation, the grids operate under system security constraints. These constraints include requiring certain resources to be utilized and require the power system to be operated in certain ways." HECO PSIP at 4-28.

a.

Technical Basis For Requirements Is Not Clearly Established And Defined In Technology-Neutral Terms

The HECO Companies dedicate Chapter 4 and Appendix D of each plan to describing the system security analyses that were conducted for each system. However, the analyses are incomplete in several respects. For instance, in the documentation supporting the significant ramp rate requirements described in Tables 4-4 to 4-14, the HECO Companies state that, "The ramp rate requirement was assumed to be 10% per minute for both PV and wind energy resources. The value was derived from analysis EPS has completed that is not part of this report."

In discussing the analysis on the proposed contingency reserve requirements, the HECO Companies state that the analysis defines boundary conditions for potential system operation in 2017, 2022, and 2030, and that the boundary conditions represent, "the likely operating requirements due to the large additions of renewable energy and changes in load expected in the future." In reviewing the system security analyses, the commission observes that the HECO Companies have generally assumed that all renewable energy sources would be producing full output simultaneously in establishing these boundary conditions. Given the diverse types of resources (wind, solar, and other renewable types), location throughout each island, and type of generator

(utility-scale vs. customer-sited), it appears highly unlikely that all of these sources could produce at their nameplate capacity simultaneously while at the same time the largest generating unit on the island would trip offline.

Based on these observations, it appears that the contingency requirements set by this assumption may be conservative, and therefore needlessly expensive and/or over-restrictive. The HECO Companies have provided no assessment of the likelihood of the island systems potentially experiencing the conditions assumed in the analyses. It is also not clear whether the system security analyses were informed by the results of the simulated dispatch of each system with the production cost analyses.[113]

In addition, the methods used to determine regulation requirements necessary to integrate variable renewable generation resources appear to overestimate aggregate system requirements, resulting in excessive estimates of needed regulation resources and associated expense. The HECO Companies established separate regulation requirements for wind generation and PV generation but did not account for the non-coincidence of regulation needs in

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[113]See Appendix C: "Modeling Analysis and Methods" in each of the Companies' PSIPs identifying several system simulation and production cost analyses.

determining the aggregated system regulation requirements necessary to balance the net system load.[114] It appears that the Companies determined the required regulating reserves based on a percentage of the available capacity from the variable renewable resources, summed and added to existing load regulation requirements without accounting for coincidence or recognizing aggregation benefits.[115]

The need to account for the extent of coincidence of contributing elements in determinations of utility system needs is a well-established utility planning and operations principle. For example, forecasts of utility system peak demand inherently recognize that aggregate system requirements are not a simple sum of customers' individual requirements. It would be unreasonably expensive to acquire sufficient generation resources to meet the sum of all individual customer peak demands when these demands are not coincident in contributing to system peak demand.[116]

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[114]Similar or identical discussion is provided in each of the Companies' PSIP. See, e.g., HECO PSIP at 4-30 to 49.

[115]See PUC-HECO-IR-3, PUC-HECO-IR-30, and PUC-HECO-IR-33.

[116]Accounting for coincidence is also methodically applied as a well-established convention in class load studies and cost of service analyses used in regulatory proceedings to allocate aggregate system capacity requirements and costs to separate customer classes.

Similarly, unless supported by appropriate analysis, regulation requirements for individual variable renewable resources should not be expected to sum simply or linearly along with load regulation requirements to determine actual expected aggregated system regulation requirements. It would appear that aggregate system regulation requirements may be significantly lower than the sum of the regulation requirements calculated for wind, solar, and load independently.

Finally, the HECO Companies need to rigorously define the system security requirements in technology-neutral terms over the full spectrum of power system operation domains, from cycles to hours, in terms of the fundamental underlying specifications for services necessary to maintain system security, including response speed and response amount, and identify what technologies currently supply each defined service. From the information provided in the filings, it appears that certain technologies have been presumed to meet specific system security needs (or have been excluded) without a clear justification.

b.

Proposed System Security Requirements Appear Costly

In Appendix K to each PSIP, the HECO Companies have reported that the total proposed capital spending attributable to

System Security are $769 million for HECO, $114 million for MECO, and $96 million for HELCO, which total just under $1 billion ($979 million) for the entire period. Approximately three fourths, or almost $750 million, of this proposed new capital spending would occur from 2015-2020. Based on HECO's reporting, the new capital required for system security investments excludes proposed investments in "replacement dispatchable capacity," which would also be required to meet some of the ramping and regulation requirements. The total proposed costs for these replacement units is over $1.5 billion.[117]

These proposed capital expenditures would not be the only costs associated with the system security requirements. The operational rules to maintain reserves and meet ramp rate requirements would incur costs as unit commitment and dispatch is modified to meet the rules. Overall, the HECO Companies have provided no comprehensive cost estimates of the combined capital and operating costs with the proposed requirements. However, based on the information provided to date such costs appear to be considerable. Furthermore, the Companies have provided no

[117]Costs include $168 million capital expenditures for Schofield Generating Station (HECO PSIP at K-47) and costs for replacement firm generation assumed to be acquired through power purchase agreements totaling $1.212 billion and $158 million for HECO and MECO respectively (PUC-HECO-IR-7.a).

comparison of alternatives to demonstrate that the proposed requirements are a reasonable, cost-effective option to balance system reliability, clean energy achievement, and affordability.

c.

System Security Requirements Appear Likely To Limit Utilization Of And Increase Costs To Integrate Renewable Resources

Despite projections of limited curtailment in the PSIP Preferred Plans, the proposed system security requirements are likely to result in significant curtailment if the proposed unit modifications, procurement of contingency reserves, and replacement of units are delayed substantially. The commission is particularly concerned that if the HECO Companies are unable to execute their proposed plans on the projected timelines then under the proposed requirements the Companies will be forced to further constrain and curtail renewable energy sources.[118] In short, the provided information has not

[118]It appears that some resources identified in the PSIPs may already be delayed beyond assumed installation dates. "The first critical component of the Companies' grid investment plan is energy storage" (HECO letter to the commission dated April 26, 2015, filed in the instant docket at 5). A 200 MW BESS resource is scheduled in the HECO PSIP for installation in 2017 to provide "[c]ontingency reserves to bring O'ahu system into compliance with security criteria" (HECO PSIP at 5-37). Although capital expenditures for the BESS resource are scheduled to begin in 2015 (HECO PSIP at K-17), no notice or application for approval to

demonstrated that the proposed system security requirements constitute a reasonable, cost-effective set of rules for each system.

6.

Commission Observation and Concern #6:
Proposed Plan for Provision of Ancillary Services Lacks Transparency and May Not be Most Cost-Effective Option

In prior guidance on the provision of ancillary services, the commission stated, "the HECO Companies must be amenable to implementing all potential alternatives that can maintain essential grid services and lower costs to customers."[119] The commission also stated that under the Generation and Economic Dispatch Review the HECO Companies shall, "Demonstrate that HECO's current policies and operational practices by which supply resources are selected to provide ancillary services and operating reserves ensure that the combined total cost of generating electricity and providing ancillary services are and will continue to be minimized in the future (i.e., co-optimization of energy and ancillary service dispatch)."[120]

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proceed with this project has been filed with the commission as of the date of this Order.

[119]See Inclinations at 8.

[120]Decision and Order No. 32053 at 101.

Based on preliminary review, the HECO Companies have not sufficiently demonstrated their selections to provide necessary ancillary services in the PSIP Preferred Plans are the most cost-effective resources and furthermore do not appear to have fully incorporated the commission's guidance in their decision-making process.

For example, the BESS resource additions represent major capital expenditures for the utility systems. The reasonableness of the selection, sizing and design of the BESS units has not been sufficiently supported. For example, the analyses that are presented in support of the need for BESS resources are focused solely or primarily on providing contingency reserves. It has not been sufficiently demonstrated that the contingency reserves that would be provided by the BESS resources could not be provided more economically by alternative means. It has also not been demonstrated that providing contingency reserves is the best use and design objective for BESS resources on the utility systems.

HECO did not evaluate the BESS resources included in the recommended plan against alternative technologies, including demand response or greater flexibility from conventional

generation.[121] HECO states that:

> [t]he Companies did not perform an economic analysis of the various types of contingency resources although several energy storage resources were identified in Appendix J of the PSIP reports."[122]

This is evident in the MECO PSIP, which includes a BESS resource located in South Maui designed to supply 30 minutes of contingency reserves. The goal of reducing requirements for on-line generation and transmission improvements by supplying contingency reserves from alternative technologies is commendable. Predetermining that the solution must be battery energy storage, however, without consideration of other storage, demand response or system operation alternatives, is not reasonable without further analysis and/or substantial justification.[123]

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[121]The PSIPs do state that demand response resources will be used to provide ancillary services. See, e.g., the cover letters to each Company's PSIP: HECO PSIP at 4, MECO PSIP at 4, and HELCO PSIP at 4-5. Examination of the supporting analyses, however, indicates that demand response programs were not actually considered as alternatives in the selection, sizing or design of the BESS resources included in the preferred plans.

[122]PUC-HECO-IR-27 at 1.

[123]The commission also notes that the sizing of the proposed BESS resource in South Maui is based on a provisional security standard which requires that "contingency reserves are required to be sustainable for 30 minutes to allow for off-line reserves to be started and brought on-line to replace the contingency reserves." PUC-HECO-IR-29. It is not clear that 30 minutes is the actual time necessary to bring other MECO resources on line. Although MECO acknowledges that the sizing of the BESS would be further optimized

In particular, demand response resources have not been sufficiently or appropriately examined. The fast response capabilities of demand response resources have not been acknowledged or considered. Several other sources of ancillary services also appear to have been insufficiently considered in the PSIPs, including the very fast response capabilities of new wind resources, the proposed ICE generation additions, and innovative system and existing generation unit operation practices.

The commission is also concerned regarding the integrity of the modeling methods used to evaluate the effectiveness and cost-effectiveness of various means to provide system ancillary service needs. Incorrect or oversimplified modeling methods, or misapplied analysis design, constraints or assumptions, can produce spurious or inconclusive results. Several shortcomings in the PSIP supporting analyses suggest that inaccuracies may be pervasive throughout the modeling analysis methods.

For example, the analysis of the benefits of potential ancillary service capabilities of wind resources on the

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in an RFP process based, at least in part, on actual time requirements, this approach would not appear to appropriately allow consideration of providing at least some part of the required contingency reserves from more economical alternative sources.

HELCO system is indicative of fundamental analysis problems.[124] HELCO reports that two teams of analysts reached differing results. HELCO concludes from its analysis that the ability of the wind resources to provide ancillary services would increase system costs, even without any identified associated costs for the wind resources to provide the ancillary services.[125] A first concern is that, under further examination, it is clear that the analysis methods used were so simplistic and flawed that the economics of the ancillary capabilities of the wind resources were not meaningfully measured.[126] A second concern is that the unsupported conclusion of the analysis, if left uncorrected, could result in a missed opportunity to lower costs and potentially increase the penetration of renewable generation. A third - and most troubling - concern is that HELCO failed to recognize or explicitly

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[124]See HELCO PSIP at L-6.

[125]See Response to PUC-HECO-IR-19.b.

[126]The analyses modeled the wind resource capability to provide ramping and regulating services by limiting the output of the wind resource to a fraction of available capacity at all times. See PUC-HECO-IR-19.b. and HELCO PSIP Appendix D, Scenarios 3 and 4. This is clearly not representative of how a wind facility would be operated to most economically provide ancillary services. The commission observes that this analysis method is so clearly flawed that the purported results and conclusions regarding resource economics are meaningless.

acknowledge the shortcomings of its analysis in characterizing its asserted conclusions.

Generally, the commission observes that misapplied "flat scheduling" of resources or other over-simplistic methods in the analysis of demand response resources, energy storage or generation unit capabilities and flexibility should not be expected to produce correct, reliable results on which to base reasonable conclusions regarding the provision of effective or cost-effective ancillary services or determination of the extent of uneconomic curtailment of resources.

In light of these concerns and the importance of the analysis findings, all of the analysis methods, constraints and assumptions supporting the PSIP conclusions and recommendations should be thoroughly reviewed for accuracy and corrected as appropriate. It is the HECO Companies' responsibility to provide sufficient analytical tools and methods to provide meaningful analysis in support of its resource plans. The HECO Companies' customers should not be exposed to unnecessary costs or risks as a result of insufficient planning analysis models, methods or efforts.

In sum, the HECO Companies have not demonstrated that the proposed selection, sizing and design of resources are the most cost-effective option to provide ancillary services in the

Preferred Plans. As a result, projected costs are possibly higher than necessary. In light of the magnitude of the capital expenditures for the proposed resources identified in the PSIPs to provide ancillary services, this matter should be appropriately addressed by supplemental analysis in this proceeding.

7.

Commission Observation and Concern #7:
PSIP Analysis Concerning Inter-Island Transmission
Lacks Sufficient Detail

The HECO Companies' conclusion that inter-island transmission is not cost-effective,[127] and does not appear to be sufficiently supported by the analyses and discussion provided in the PSIPs. The commission is concerned that the HECO Companies have not utilized a consistent basis for benefit-cost analysis compared to other analyses in the PSIPs. In addition, the HECO Companies have not sufficiently explained why their conclusion in this filing contrasts so markedly from prior analyses, including analyses conducted by the HECO Companies.

[127]See, e.g., HECO PSIP at 5-57 to 5-58.

a.

Consistent Consideration of Benefits and Costs

The PSIPs include results from two sets of analyses of the economics of inter-island transmission between the Islands of Maui and Oahu.[128]

> The feasibility of utilizing an interisland cable for joint dispatch of the Hawaiian Electric and Maui Electric systems was evaluated by comparing:
>
> > The net present value of system production costs with the Hawaiian Electric and Maui Electric systems assumed to be interconnected in a manner that allows economic dispatch of generation on both islands; to
> >
> > The sum of the present value of system production costs for each of the Hawaiian Electric and Maui Electric systems.
>
> The difference between these two cases provides the gross benefit that could be provided by an interisland cable system that enables joint dispatch. This represents the higher bound of what an interisland cable could cost and still be economically feasible. This value was then compared to known cost estimates for an O'ahu-Maui interisland HVDC cable system. (footnote omitted).[129]

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[128]Two sets of analyses were performed by two separate teams (identified as "Black and Veatch" and "PA Consulting"). Each team compared two scenarios, with and without inter-island transmission Oahu-Maui grid-tie.

[129]HECO PSIP at 3-10; MECO PSIP at 12-13.

The HECO and MECO PSIPs conclude:

> [T]he analysis of both companies indicates that the transmission cable is not a cost effective solution. The cable could not possibly be built for the estimated amount to be cost effective. Based upon the two analyses, the NPV of the estimated savings excluding the cost of the transmission cable are $60 M - $ 175 M, respectively. For the cable system to be cost effective, the NPV for the design, construction, operation, and maintenance of the cable system would have to be less these amounts.[130]

The benefits of inter-island transmission included in the PSIP analyses appear to include only production cost savings for a limited number of years of inter-island transmission system operation. From the descriptions provided in the PSIPs, one analysis included benefits for the years 2022 to 2030[131] and the other analysis includes benefits for the years 2015-2030.[132] These streams of benefits would appear to be only a fraction of the life cycle benefits expected for a transmission system with an economic and engineering life several times as long as what was considered. It is not clear why it is appropriate to compare the value of a stream of benefits for a limited period with the capital

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[130]HECO PSIP at 5-58; MECO PSIP at 5-42.

[131]HECO PSIP at 5-59, regarding the "Black and Veatch" analysis.

[132]HECO PSIP at C-11, regarding the "PA Consulting" analysis.

and financing costs associated with full resource life in determining cost-effectiveness.[133]

b.

Disparities with Other Analyses

Inter-island transmission options were previously analyzed by the HECO Companies in the 2013 HECO Company IRP Report filed in Docket No. 2012-0036. Inter-island transmission between the Islands of Maui and Oahu is a subject specifically being examined by the commission in Docket No. 2013-0169. Several analyses filed in these dockets reach conclusions regarding the cost-effectiveness of inter-island transmission options that are different than the HECO Companies' analyses and conclusions in the PSIPs. The analyses filed by several intervening Parties in Docket No. 2013-0169 conclude that there would be net economic benefits provided by inter-island "grid-tie" transmission between the Islands of Maui and Oahu.[134] The reasons

[133]A comparison of annual revenue requirements or levelized annual costs, with and without an inter-island transmission system was not presented for either of the analyses presented in the PSIPs.

[134]A comparison of several parties' inter-island transmission cost estimates, relevant assumptions and cost-effectiveness analysis results is provided in Table 3 of the Division of Consumer Advocacy's Reply Comments, filed October 9, 2013, in Docket No. 2013-0169, at 17.

for such disparity in the results of the various analyses filed with the commission are not addressed or discussed in the PSIPs. At this point, the HECO Companies have not sufficiently explained their differing assumptions, analysis methods and conclusions in the various economic analyses filed with the commission.

8.

Commission Observation and Concern #8:
Customer and Implementation Risks are not Adequately Addressed

The favorable outcomes projected by the HECO Companies under the Preferred Plans appear fundamentally dependent on several uncertain factors. The potential impacts of these uncertainties have not been adequately identified or addressed. Of particular concern, the extensive proposed capital investments presumed in the Preferred Plans appear to entail substantial risks to customers that have not been appropriately addressed.

Where substantial uncertainties exist that would affect major resource planning or system operation decisions, the uncertainties should be clearly characterized and, to the extent practical and necessary, the impacts of the uncertainties should be quantified and examined by appropriate sensitivity analyses or risk assessment. The consideration of the impact of uncertainties on major decisions should include quantification of

impacts on overall system costs and rate impacts. Several key uncertainties and risks appear to fall in the following areas:

- impacts of the timing and availability of LNG imports;
- impacts of changes in relative LNG and petroleum fuel prices;
- impacts of improvements in technology, reductions in cost, and availability of renewable resources; and
- potential risks of stranded costs and rate impacts in light of the extensive proposed capital expenditure plans, including the impacts of potential substantial customer system exit on remaining utility customers.

As noted in Figures 11, 13 and 16, the HECO Companies propose an immediate switch of oil-fueled generation to LNG by 2017 with significant projected savings resulting from this fuel switch. A fundamental factor in this outcome is the capability to import LNG into Hawaii in this timeframe with the assumed or higher level of cost savings. The HECO Companies have not provided any analysis of the impacts under the Preferred Plan if this assumption does not hold true or any alternative plans if economical LNG supplies are unavailable.

In Table 2 and Figure 12, the HECO Companies list the assumptions about available renewable resources and costs. The cost information appears outdated in light of more recent assessments. The identified constraints on renewable resource

availability appear to be over-restrictive in some respects. The HECO Companies have not provided any sensitivity analyses highlighting the impact of several of the limiting assumptions about renewable technologies, or if some of the assumed resources are unavailable, particularly geothermal energy on Maui.

Finally, the investment strategies proposed by the HECO Companies appear to entail risks that are borne ultimately by customers. The massive new capital investment program could become a risk for stranded costs if customer exit from the HECO grid is higher than expected, or if sales levels are lower than expected for any number of plausible reasons. The HECO Companies have provided no discussion of this risk or possible measures to lower or mitigate the risk to customers.

The commission is also seriously concerned with the implementation risks of the capital program proposed in the Preferred Plans. As noted earlier, the Preferred Plan proposes a 3-4x increase in annual capital spending in the next five years, which will challenge the HECO Companies ability to successfully manage multiple large projects concurrently while increasing the overall number of projects. Given the Companies' recent

performance in managing large capital projects,[135] the commission is concerned about the risk of significant cost overruns and delays in execution of the proposed plan.

Finally, the commission is further concerned that the proposed size and timeline of the capital expenditure program contemplated in the PSIPs may raise financing costs because HECO asserts substantial new investments are required on an accelerated basis in the next 5 years. After preliminary review, HECO has not demonstrated the cost-effectiveness of several key projects and programs that comprise major near-term investments, and HECO's own delays on several of these projects indicate the timelines to the Company are more flexible than asserted in the PSIPs. Given these facts, the commission believes future revisions to the PSIPs need to propose an overall plan that is less likely to result in unreasonable financing costs for customers.

[135]For example, there were substantial cost overruns for the HECO CT-1 generating unit addition and the Companies' Customer Information System projects.

C.

PSIP Supplements and Amendments Must
Address Changes in Circumstances Since PSIPs Were Filed

The commission observes that several substantial changes in circumstances have occurred since the HECO Companies made their initial PSIP filings. These include:

- passage of Act 97, which amends Hawaii's RPS requirements;
- substantial decreases in petroleum prices;
- changes in the estimated timing for implementation of major near-term projects in Preferred Plans, including LNG utilization and Oahu BESS projects;
- potential significant changes in Federal energy policies that may affect Hawaii's utilities, including the July 29, 2015 U.S. Supreme Court decision regarding MATS regulations and promulgation of the Clean Power Plan Final Rule;[136] and
- an announcement by the Governor of the State of Hawaii regarding administration policy regarding utilization of LNG fuels for electric utility power production.

The HECO Companies shall identify and characterize any known significant changes in circumstances that would affect utility plans and operations, including the circumstances listed above. The Companies shall explain how these circumstances could

[136]See note 106, *supra*.

affect utility plans and supplement, amend and/or update the PSIPs as appropriate and necessary.

D.

Further Revisions and
Finalizing Power Supply Improvement Plans

Based on the preliminary review of the PSIPs and the Observations and Concerns articulated above, the commission has determined that the PSIPs, in their current form, are not acceptable without supplementation and amendment. This section further describes subsequent requirements for the HECO Companies, description of potential technical conferences, and role of the Parties in the revision and finalization of the HECO Companies' PSIPs.

1.

PSIP Revision Plan

As provided in the Schedule of Proceedings in this Order, the HECO Companies are required to submit a Proposed PSIP Revision Plan. This plan should explicitly document the HECO Companies' work plan to supplement, amend, and update the PSIPs. The Proposed PSIP Revision Plan should, at a minimum, describe the anticipated updates and further documentation of input assumptions, refinement and changes in analytical methods, and the timeline for developing

supplemental analytical results and amending the PSIPs. Specifically, the Proposed PSIP Revision Plan must explicitly detail the HECO Companies proposed scope of work to address the commission's Observations and Concerns and the substance of the Initial Statement of Issues identified in this Order, including but not limited to the observations, concerns, considerations and issues identified in Attachment A to this Order.

2.

Technical Conferences

The commission may, at its discretion, convene technical conferences to examine and provide guidance regarding the HECO Companies' efforts to supplement and amend the PSIPs. Technical conferences will be chaired by commission staff or its designee. The commission may also assign more specific roles for one or more of the commission's technical advisors to examine and provide guidance regarding the supplemental PSIP analyses.

3.

Role of the Parties in Revision and Update of the PSIPs

The commission acknowledges the significant public concerns raised after initial filing of the PSIPs and demonstrated by the large number of petitioners that moved to intervene. The commission is establishing a statement of issues and schedule of proceedings that will allow Parties to provide comments and state positions in this proceeding. Furthermore, technical conferences would allow further opportunities to allow discussion, provide comments, and offer guidance to the HECO Companies as they revise their PSIPs. The commission also recognizes through public comments filed in this proceeding that some Parties have engaged consultants with sophisticated utility planning analytical capabilities. All of the Parties are encouraged to offer constructive feedback to assist the HECO Companies in developing final PSIPs, including submitting alternative analyses and suggesting analytical methods to assist the HECO Companies in addressing the Commission's Observations and Concerns.

4.

Summary

Given the significant concerns identified herein, the commission finds it necessary to remind the HECO Companies that as a result of their numerous, repeated failures to properly plan for an affordable, high renewable future,[137] the commission has had to take appropriate actions to address the Companies' poor performance. The commission directed the Companies to develop and file PSIPs because incomplete and improper planning was a fundamental cause for many of these avoidable missteps. Given the state's policy directives to achieve a high renewable future and the significant investments required to reach this goal, the commission believes the development of acceptable PSIPs are critical to continuing progress towards the state's policy goals while maintaining affordable electricity rates. Furthermore, development of acceptable plans is essential to the HECO Companies fulfilling their role to provide a platform to meet the diverse service requirements of their customers by integrating a variety of generation sources and customer-sited resources in an economically and operationally efficient manner.

[137]See footnote 3, supra.

VI.

INITIAL STATEMENT OF ISSUES

This proceeding was initiated by the commission in order to review the PSIPs filed by each of the HECO Companies. The ultimate objective is to determine a reasonable power supply plan for each of the HECO Companies that can serve as a strategic basis and context to inform important pending and future resource acquisition and system operation decisions. The Schedule of Proceedings in this docket provides for the supplementation, amendment and updating of the PSIPs as appropriate and necessary. The commission identifies the following initial statement of issues in this proceeding for the review, supplement, amendment and updating of the PSIPs for each of the Companies.

1) Whether the PSIPs, as amended and updated in this proceeding, provide useful context and meaningful analysis to inform major resource acquisition and system operation decisions and identify well-reasoned and adequately-supported plans and actions that will result in reliable energy services, meeting State clean energy requirements, while ensuring that costs and rates will be reasonable.

2) Whether the PSIP for each of the HECO Companies, as amended and updated in this proceeding, includes reasonable

plan components as required for HECO in Order No. 32053, including: a. a Fossil Generation Retirement Plan;

b. a Generation Flexibility Plan;

c. a Must-Run Generation Reduction Plan;

d. an Environmental Compliance Plan;

e. a Key Generator Utilization Plan;

f. an Optimal Renewable Energy Portfolio Plan; and

g. a Generation Commitment and Economic Dispatch Review.

3) Whether the PSIPs, as amended and updated, adequately address the Observations and Concerns addressed in this Order in Section VI.

VII.

INTERVENTION AND PARTICPATION

A.

Motions To Intervene

Twenty-one motions to intervene were filed in this docket. Each of the movants is briefly described below.

1. Renewable Energy Action Coalition Of Hawaii, Inc. ("REACH"). REACH states that it is "a Hawaii not-for-profit trade association whose members include businesses engaged in the production, manufacture, development, installation, integration, construction, marketing, sale and/or distribution of renewable

energy and/or renewable energy systems in the state of Hawaii, on islands served by the HECO Companies."[138] REACH further states that its "member businesses develop and install renewable energy systems that are interconnected with the power supply systems of the HECO Companies, and that supply electric energy to the power supply systems of the HECO Companies."[139]

REACH states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> An order approving the proposed PSIPs of the HECO Companies will have a direct and substantial adverse effect on Applicant's property, financial and economic interest because the proposed PSIPs, if implemented, will affect whether or not such renewable energy systems may be interconnected with the utilities' power supply systems, and, therefore, whether or not such renewable energy systems are developed and installed to the economic benefit or economic detriment of Applicant's member businesses.[140]

2. Life Of The Land ("LOL"). LOL states that it is a non-profit Hawaii-based organization whose members live, work,

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[138]"Motion For Intervention Of Renewable Energy Action Coalition Of Hawaii, Inc. And Certificate Of Service," filed Aug. 22, 2014 ("REACH Motion"), at 3-4.

[139]REACH Motion at 4.

[140]REACH Motion at 4.

and recreate in Hawaii,[141] and explains that its interests may be impacted by this docket for the following reasons, among others:

> The issues may touch upon business models, smart grids, liquefied natural gas, retirements, replacements, new transmission lines, demand response, storage, ancillary services, operational efficiencies, must-run generation and increase[d] generation flexibility. All of these issues have a direct impact on Life of the Land's position that distributed dispersed renewable energy CAN significantly decrease environmental, social and cultural impacts *IF* done right.[142]

Acknowledging that the Consumer Advocate "is bound by the law to represent the interests of the general public, that is, the consumers of utility services[,]" LOL contends that its interests differ from the general public because LOL "is concerned with overall justice, equality, externalities, environmental justice, climate justice, social, environmental, climatic and greenhouse gas impacts."[143]

3. NextEra Energy Hawaii, LLC ("NextEra Hawaii"). NextEra Hawaii states that "[f]or the past three years . . . [NextEra Hawaii] has devoted substantial efforts to exploring and

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[141]"Life Of The Land's Motion To Intervene, Exhibit 1, Affidavit Of Henry Q Curtis & Certificate Of Service," filed Aug. 25, 2014 ("LOL Motion"), at 5.

[142]LOL Motion at 6.

[143]LOL Motion at 12.

examining competitive solutions for undersea cable systems and other energy resources capable of dramatically advancing Hawaii's clean energy future" including an investment of "over $10 million to assemble a strong local team, acquire site control, develop viable cable routes, undertake preliminary engineering, prepare for the environmental review process, and advance other critical path work-streams" for the "development of a grid-tie undersea cable system to interconnect Oahu and Maui, and ultimately potentially Hawaii Island[,]" known as NextGrid Hawaii.[144]

NextEra Hawaii states that it benefits "from the substantial financial, managerial and technical resources of the NextEra family of companies" which "have substantial relevant experience and expertise in Hawaii and many other jurisdictions with regard to the full range of technical and energy resource planning issues expected to be addressed in the PSIPs, including but not limited to renewable generation and energy storage."[145] NextEra Hawaii further states that it will "bring to bear the extensive technical and energy resource planning experience and expertise of [NextEra Hawaii] and its affiliates to

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[144]"NextEra Energy Hawaii, LLC's Motion To Intervene, Affidavit Of Eric S. Gleason, And Certificate of Service," filed Aug. 25, 2014 ("NextEra Hawaii Motion"), at 1 and 5.

[145]NextEra Hawaii Motion at 3.

contribute to the development of a sound record as an aid to Commission decision-making."[146] Accordingly, NextEra Hawaii "anticipates that it may possibly comment on renewable generation, energy storage, and other related matters in addition to transmission" and "seeks to intervene as a full party with no limits or constraints as to the substantive issues it may address in its review of the PSIPs."[147]

NextEra Hawaii states that its interests may be impacted by this docket because, among other things, "[p]ending orders may include determinations affecting the development, construction and operation of an Oahu-Maui interisland transmission system similar to NextGrid Hawaii, as well as renewable generation, energy storage and potentially other related matters, and will therefore directly affect [NextEra's] interests."[148]

4. Hawaii Solar Energy Association ("HSEA"). HSEA states that it is a non-profit professional trade association with an organizational purpose "to promote the utilization and commercialization of renewable energy resources, including solar water heating and solar electricity in the State of Hawaii,

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[146]NextEra Hawaii Motion at 3.

[147]NextEra Hawaii Motion at 4.

[148]NextEra Hawaii Motion at 6.

to advance consumer education and understanding of solar energy technologies, and to develop sound trade and technical practices among its member companies."[149] HSEA states that it currently has 80 member companies, "most of which are Hawaii based, owned, and operated, making it the primary organizational representative of the interest of Hawaii's indigenous solar industry."[150]

HSEA states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> In addition to [the] direct and substantial impact that the pending matter will have upon HSEA members' financial and economic interests, the pending matter also stands to have a significant and direct impact upon HSEA's interests, which are, in part, to promote the utilization and commercialization of renewable energy resources, including solar hot water and photovoltaics. HSEA therefore has a direct interest in ensuring that the rules governing the installation of Distributed Generating Facilities will be structured in a way that will promote the utilization and commercialization of renewables in Hawaii in a sustainable, fair, and transparent fashion.[151]

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[149]"Motion To Intervene Of The Hawaii Solar Energy Association And Certificate Of Service," filed Aug. 25, 2014 ("HSEA Motion"), at 2.

[150]HSEA Motion at 2.

[151]HSEA Motion at 4. The commission observes that the HSEA Motion does not include an affidavit attesting to the veracity of HSEA's numerous factual assertions. See HAR § 6-61-41(b) ("If a motion requires the consideration of facts not appearing of record, it shall be supported by an affidavit or affidavits."). However, it appears that, although also an attorney, Leslie Cole-Brooks signed the HSEA Motion as "Executive Director" of HSEA.

5. Puna Pono Alliance ("Puna Pono"). Puna Pono is a nonprofit, unincorporated association which is "interested in issues of health, safety, economy and quality of life relating to the effect of geothermal generating facilities and electric costs on the people of Hawai'i."[152] Puna Pono states that its interests may be impacted by the outcome of this docket for the following reasons among others:

> Many of [Puna Pono's] members live off the grid while enjoying a pleasant and comfortable rural lifestyle. They grow food, catch rainwater for domestic use, share their natural bounty and enjoy a sense of independence.
>
> On-site, decentralized generation of electricity is but one part of that independence equation, but in the context of the PSIP review it may be the more important part.[153]

Puna Pono also discusses various health and safety concerns relating to the production of geothermal energy and asks the question "[a]t what point . . . does impact on the community over-balance the economic goals of the utility and renewable energy and ratepayer goals?"[154]

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[152]"Puna Pono Alliance's Motion To Intervene, Memorandum In Support Of Motion, Declaration Of Thomas L. Travis, Exhibit A, Certificate Of Service," filed Aug. 25, 2014 ("Puna Pono Motion"), at 2.

[153]Puna Pono Motion at 7.

[154]Puna Pono Motion at 9-10.

6. County Of Maui ("COM"). COM states that it has a variety of interests in this proceeding including (1) customer-generator or prosumer interests; (2) renewable fuels development interests; (3) energy security interests, and (4) economic development interests.[155] Thus, COM concludes that its intervention should be granted because its "participation in the instant proceeding will help to ensure that the PSIPs are thoroughly reviewed for relevancy from a community-based, local government perspective."[156]

COM contends that "[n]one of the parties" "have the same interests as [COM] as a large consumer and as the governing entity of the public affairs of Maui County" and "[n]o other party to this proceeding has the comprehensive interests of [COM], which has the responsibility for the public welfare and for commerce in Maui County."[157]

7. The Alliance for Solar Choice ("TASC"). TASC states that its mission is to lead advocacy across the country

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[155]"County Of Maui's Motion To Intervene, Affidavit Of Kalvin K. Kobayashi, Certificate Of Service," filed August 26, 2014, at 4-5 ("COM Motion").

[156]COM Motion at 4.

[157]COM Motion at 6.

for the rooftop solar industry.[158] TASC further states that its membership includes the "vast majority of the nation's rooftop solar market and include SolarCity, SunRun, and Solar Universe[,]" and that "[t]hese companies and their partners are leading solar service providers in Hawaii, are responsible for over 10,000 residential, school, government and commercial installations in the State, and collectively employ hundreds of Hawaii residents."[159]

TASC states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> TASC anticipates the PSIPs will propose both opportunities for DER-equipped customers to meet the challenges HECO faces and policies that TASC is concerned may limit the value of existing and future DER investments for ratepayers. The value of TASC members' and their customers' projects, therefore, will be affected by the Commission's review and resolution of the PSIPs. As such, the resolution of this docket will directly impact TASC, its members, and their customers' financial and property interest.[160]

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[158]"Motion To Intervene Of The Alliance For Solar Choice, Verification, And Certificate Of Service," filed Aug. 26, 2014 ("TASC Motion"), at 2.

[159]TASC Motion at 2.

[160]TASC Motion at 6. The commission notes that the TASC Motion has several deficiencies. The TASC Motion does not include an affidavit attesting to the veracity of TASC's numerous factual assertions in support of its argument for intervention. See HAR § 6-61-41(b). To that end, the submission of a "verification" signed by Tim Lindl "Counsel to The Alliance for Solar Choice" is inapplicable to a motion to intervene. See id.

8. Hawaii Renewable Energy Alliance ("HREA"). HREA states that it is a "Hawaii-based, private, nonprofit corporation," and that its members include "developers, manufacturers, distributors, scientists, engineers, and advocates in renewable energy."[161] HREA states that its interests may be impacted by this docket for the following reasons, among others:

> [HREA's] member organizations and individuals are companies, consultants or agents involved in and/or considering manufacturing, marketing, selling, installing and maintaining wind and solar systems in residential applications and are concerned about residential electric utility customers' access to conventional financing options. Accordingly there are substantial financial and other interests implicated in this docket.[162]

9. The Gas Company, LLC, dba Hawaii Gas ("Hawaii Gas"). Hawaii Gas is a "public utility providing gas service throughout the major islands of Hawaii. Hawaii Gas engages in both regulated and non-regulated gas utility operations,

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("If a motion requires the consideration of facts not appearing of record, it shall be supported by an affidavit or affidavits." (emphases added)). Indeed, it would be unusual for counsel to both represent TASC, and also be competent to testify as to factual matters on behalf of TASC.

[161]"Motion To Intervene Of Hawaii Renewable Energy Alliance, And Certificate Of Service," filed Aug. 26, 2014 ("HREA Motion"), at 2.

[162]HREA Motion at 4.

serving approximately 68,700 customers throughout the State of Hawaii" and its "regulated gas operations consist of the purchase, production, transmission, and distribution through underground gas pipelines, and sale for residential, commercial, and industrial uses" of synthetic natural gas, liquid petroleum gas, and liquefied natural gas.[163]

Hawaii Gas states that because each PSIP is to include, among other things "[a]n analysis of the fuel, operation and maintenance and capital costs of fuel switching from LSFO to natural gas, and the resulting reduction in generating unit and system emission levels[,]"

> [a] full analysis of the role that natural gas can and should play, not just in emissions reduction, but also in the reduction of energy costs and operational efficiencies, must consider and include discussions about the use of Hawaii Gas' existing gas infrastructure as well as economies of scale in transporting large quantities of LNG to Hawaii. Such discussions are directly tied to Hawaii Gas' property, financial, and operational interests.[164]

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[163]"Hawaii Gas' Motion To Intervene, And Certificate Of Service," filed Aug. 26, 2014 ("Hawaii Gas Motion"), at 3.

[164]Hawaii Gas Motion at 2 and 5. The Hawaii Gas Motion does not include an affidavit attesting to factual assertions contained therein. See HAR § 6-61-41(b). Nonetheless, as a regulated gas utility, the commission finds that Hawaii Gas' participation in this docket will assist in the development of sound record.

10. AES Hawaii, Inc. ("AES"). AES "owns and operates a cogeneration facility typically dispatched at a capacity of 180 MW, located in Honolulu, Hawaii, which uses coal as its primary energy source[.]"[165] AES Hawaii is an independent power producer that sells capacity and associated electrical energy from the AES Facility to HECO under a Power Purchase Agreement.[166]

AES states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> [D]ue to the Commission's instructions to HECO to include the AES Facility in its PSIP and analysis, AES Hawaii has a strong business and financial interest in the HECO PSIP submitted by HECO in this Docket. Accordingly, this proceeding would significantly affect AES Hawaii's financial and business interests as an independent power producer in Hawaii.[167]

11. Blue Planet Foundation ("Blue Planet"). Blue Planet states that it is a Hawaii "public interest organization . . . dedicated to promoting Hawaii's swift transition to a clean energy economy through the rapid adoption of renewable energy and increased energy efficiency."[168] Blue Planet states

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[165]"Motion To Intervene Of AES Hawaii, Inc., Affidavit Of Jeffrey Walsh, And Certificate Of Service," filed on Aug. 27, 2014 ("AES Motion"), at 3.

[166]See AES Motion at 3.

[167]AES Motion at 4.

that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> The effect of the pending order in this proceeding may be to establish specific rulings or determinations concerning some or all of [Blue Planet's] purposes and subjects. Specifically, the pending order in this proceeding may relate to approval or modifications to the PSIPs, which will affect energy resource planning, the advancement of Hawaii's clean energy future, and Blue Planet's mission. Thus, the pending order is likely to directly affect Blue Planet's interests.[169]

12. Ulupono Initiative ("Ulupono"). Ulupono states that it is "a for-profit social impact investment firm" that "invests in innovative organizations . . . to catalyze large-scale positive change to improve lives and communities in Hawaii."[170] Ulupono further states that it has made "very substantial investments, aggregating to date well over $30 million, in solar

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[168]"Blue Planet Foundation's Motion To Intervene, Declaration Of Sebastian J. Nola, And Certificate Of Service," filed Aug. 27, 2014 ("Blue Planet Motion"), at 2-3.

[169]Blue Planet Motion at 6. Although the Blue Planet Motion does not include an affidavit attesting to the various factual assertions, see HAR § 6-61-41(b), it appears that, although also an attorney, Richard Wallsgrove signed the Blue Planet Motion as "Program Director" of Blue Planet.

[170]"Motion To Intervene By Ulupono Initiative LLC, And Certificate Of Service," filed Aug. 27, 2014 ("Ulupono Motion"), at 3.

energy, biofuels, waste-to-energy, electric vehicle infrastructure and seawater air conditioning projects, and is exploring similar investments in firms planning for geothermal, energy storage (including pumped hydro) and energy efficiency projects."[171]

Ulupono states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> How each of the PSIPs is evaluated and what the total configuration of each PSIP is ultimately approved by the Commission will have a direct, substantial and long-lasting impact on those businesses in which Ulupono has invested and will invest, since Ulupono has identified and selected each of those businesses because of their capability to have a large-scale and catalytic impact on the provision of renewable energy, which will ideally be integrated into the PSIPs as well as influence and be influenced by the final PSIPs.[172]

13. The Hawaii PV Coalition ("HPVC"). HPVC states that it is a professional trade association whose goals "are to promote the development of sound and fair energy policies that enhance Hawaii's energy security and promote environmental and economic

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[171]Ulupono Motion at 3.

[172]Ulupono Motion at 6. The Ulupono Motion is signed by counsel and does not include an affidavit attesting to factual assertions therein. See HAR § 6-61-41(b). Nonetheless, because Ulupono has generally contributed to the development of a sound record and complied with the commission's orders in other energy-policy dockets, the commission finds that Ulupono's participation may likewise assist in the development of the record in this docket.

sustainability in the state's energy sector."[173] HPVC further states that its member companies "have specific expertise and experience that will inform and benefit the proceeding, and also have concentrated economic interests that make them disproportionately exposed to its results."[174]

HPVC states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> Because their primary businesses involve supply of power to customers of the HECO Companies, HPVC members have direct financial exposure to the outcome of this proceeding. The magnitude of the impact of the proceeding's outcome on HPVC members' interests depends on the specific changes adopted during the proceeding.[175]

14. The Department of Business, Economic Development, and Tourism ("DBEDT"). DEBDT states that:

> [Its] interest in intervening in this proceeding is based on (a) the effect of the results of this proceeding on [DBEDT's] execution of its statutory functions and the energy resources coordinator's statutory role and duties, (b) the financial implications related to the development of renewable energy resources, and (c) [DBEDT's] intervention in other dockets initiated by the

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[173] "Motion For Intervention of Hawaii PV Coalition, Affidavit Of Mark Duda, And Certificate Of Service," filed Aug. 27, 2014 ("HPVC Motion"), at 2-3.

[174] HPVC Motion at 3.

[175] HPVC Motion at 5.

Commission consistent with the director's role as the energy resources coordinator.[176]

DBEDT elaborates that "this proceeding is expected to form part of an overall, integrated program of regulatory measures to support the increased, economically- and technically-viable use and development of Hawaii's renewable energy resources"[177] and the "HECO Companies' consolidated PSIPs will explore critical matters requiring systematic analysis of existing and proposed energy resource programs and evaluation of analysis consistent with the powers and duties of the energy resources coordinator[.]"[178]

DBEDT maintains that it "is a relevant, helpful and necessary party to the proceeding" because it "has a clear interest in and value to the proceeding as the representative of the State's policy objectives and public good" and "only [DBEDT] can provide that larger economic and taxpayer perspective, including promotion of economic development[.]"[179]

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[176]"Department Of Business, Economic Development, And Tourism's Motion To Intervene, And Certificate Of Service," filed Aug. 27, 2014 ("DBEDT Motion"), at 8.

[177]DBEDT Motion at 3.

[178]DBEDT Motion at 2.

[179]DBEDT Motion at 4-5, 11. Although the DBEDT Motion does not include an affidavit attesting to factual assertions therein, see HAR § 6-61-41(b), as discussed in Section IV.C.2, the commission nonetheless finds that DBEDT should be granted

15. Sierra Club. Sierra Club states that it is (1) a national non-profit organization, and (2) the largest environmental membership organization in Hawaii, with over 12,000 members and supporters across the state, "with particular focus on promoting clean energy, energy independence, climate security, and greenhouse gas emissions."[180] Sierra Club argues that its interests may be impacted by the outcome of this docket because

> Sierra Club and its members are dedicated to promoting a decisive transition away from fossil fuels and toward greater energy efficiency and renewable energy. They thus have interests in ensuring that HECO Companies' long-term plans fulfill these necessary and legally mandated goals in the public interest. Sierra Club's members include those who work in the clean energy field and marketplace, who install or intend to [sic] clean energy measures such as energy efficiency and distributed renewable energy, who live and reside in areas affected by the utility's present and proposed future operations and infrastructure, and whose daily lifestyles and livelihood depend upon the state's long-term energy priorities and decisions.[181]

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intervenor status in light of its statutory mandates in the area of energy policy.

[180]"Sierra Club's Motion To Intervene, Affidavit Of Scott Glenn, And Certificate Of Service," filed Aug. 27, 2014 ("Sierra Club Motion"), at 2.

[181]Sierra Club Motion at 3.

Sierra Club contends that although it "promotes the broader public interests in clean energy development, energy independence, and greenhouse gas reductions, its organization and members have special and important interests that are distinct from the public at large."[182]

16. Tawhiri Power LLC ("Tawhiri"). Tawhiri states that it "has provided HELCO with clean renewable wind energy since 1984"[183] but "does not have a power purchase agreement with HECO or MECO[.]"[184] Tawhiri states that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> [Tawhiri] has invested tens of millions of dollars and countless man hours in its Wind Farm and interconnection equipment to provide up to 20.5MW of power to the HELCO system and its customers. Any decisions in this Docket that affect how [Tawhiri] operates and how it will be curtailed, will have an economic impact on [Tawhiri].[185]

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[182]Sierra Club Motion at 2.

[183]"Tawhiri Power LLC's Motion To Intervene, Verification, And Certificate Of Service," filed Aug. 27, 2014 ("Tawhiri Motion"), at 5.

[184]Tawhiri Motion at 6, n.8.

[185]Tawhiri Motion at 4.

17. SunPower Corporation ("SunPower"). SunPower states that it designs and manufactures high efficiency photovoltaic panels sold in Hawaii, and that it designs, finances, builds, and operates solar projects worldwide.[186] SunPower further states that it has "designed, installed and financed over 40 MW of residential and commercial systems" in Hawaii.[187] SunPower asserts that its interests may be impacted by the outcome of this docket because "[a]ny decisions in this Docket that affect how, when, where, and how much renewable PV power [SunPower] provides to the HECO Companies and whether it will be curtailed, will have an economic impact on [SunPower]."[188]

18. Paniolo Power Company, LLC ("Paniolo Power"). Paniolo Power is a wholly-owned subsidiary of Parker Ranch, Inc., and through its parent and affiliate "owns or controls approximately 130,000 acres of land on the island of Hawaii" that includes "significant wind and solar energy resource areas and large elevation differences that could be used for pumped

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[186]"SunPower Corporation's Motion To Intervene, Verification, And Certificate Of Service," filed Aug. 27, 2014 ("SunPower Motion"), at 2.

[187]SunPower Motion at 2.

[188]SunPower Motion at 4.

storage hydroelectric generation."[189] In 2013, Parker Ranch began a comprehensive analysis of its resources focusing on Parker Ranch's goal "to reduce electricity rates by maximizing the use of low-cost renewable resources[,]" and the assessment "indicated that Parker Ranch has a range of energy generation and grid portfolio options that could lower the cost of electricity to Parker Ranch and the surrounding communities of Waimea and North Kohala."[190]

Paniolo Power argues that it "intends to develop or cause to be developed certain of these energy generation and grid portfolio options" and thus "if Paniolo Power does not have the ability to add its perspective to this Docket, the feasibility of Paniolo Power's future plans may be significantly impacted."[191]

19. Eurus Energy America Corporation ("Eurus"). Eurus states that it is "the developer of several proposed utility-scale renewable energy projects in Hawaii, including a proposed approximately 30 MW photovoltaic energy project located in Waianae, Oahu," which makes it "an important partner in the

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[189]"Motion To Intervene of Paniolo Power Company, LLC, Affidavit Of Neil T. Kuyper, And Certificate Of Service," filed Aug. 27, 2014 ("Paniolo Power Motion"), at 1.

[190]Paniolo Power Motion at 2.

[191]Paniolo Power Motion at 3, 7.

PSIPs."[192] Eurus argues that is "has an interest in ensuring that the HECO Companies implement fair and transparent resource acquisition procedures that allow Eurus' proposed renewable energy projects to compete on even footing with other proposed projects and any 'self-build' projects that the HECO Companies may propose."[193]

Accordingly, Eurus contends that the "decisions to be made in this Docket could significantly harm or advance Eurus' interests" because "if other intervenors in this Docket persuade the HECO Companies and the Commission to remove references to photovoltaic energy generation from the HECO Companies' PSIPs, Eurus will not have a forum in which to argue that the photovoltaic energy generation should be a critical component in the utilities' long term strategy."[194]

20. County of Hawaii ("COH"). COH states that it "continues to intervene to ensure that future decisions pass economic and technological rigor and are community friendly and cost effective in order to enable a sustainable quality of life

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[192]"Motion To Intervene Of Eurus Energy America Corporation, Affidavit Of Bradley S. White, And Certificate Of Service," filed Aug. 27, 2014 ("Eurus Motion"), at 4.

[193]Eurus Motion at 5.

[194]Eurus Motion at 5-6.

and healthy economy for all our residents."[195] COH explains that its interests may be impacted by the outcome of this docket for the following reasons, among others:

> As an electric ratepayer, the County accounts for approximately six (6) to seven (7) percent of HELCO's annual kilowatt-hour sales, approximately thirty million dollars ($30,000,000) and is HELCO's largest single customer. The proposed review and investigation could have a material impact on the nature and cost of electricity purchased by the County. Moreover, the PSIPs, if not developed and analyzed correctly, could potentially jeopardize the future of all electric ratepayers, taxpayers, and water ratepayers on the island.[196]

Thus, COH argues that if allowed to intervene, it "will be able to provide input as to what would be in the best interest of the island of Hawai'i[.]"[197]

21. First Wind Holdings, LLC ("First Wind"). First Wind states that "[t]hrough its subsidiaries and affiliates, [it] owns and/or operates four (4) major wind projects in Hawaii"

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[195]"County Of Hawaii's Motion To Intervene And Certificate Of Service," filed Aug. 27, 2014 ("COH Motion"), at 4.

[196]COH Motion at 2.

[197]COH Motion at 6. Although the COH Motion does not include an affidavit attesting to factual assertions therein, see HAR § 6-61-41(b), as discussed in Section IV.C.2, the commission nonetheless finds that COH should be granted intervenor status given its official capacity representing all residents of Hawaii island.

which "provide up to 150 MW of power to HECO and MECO's systems."[198] Due to First Wind's existing wind farms and proposed photovoltaic projects that help the "HECO Companies meet electricity demand while complying with Hawaii's Renewable Portfolio Standard law and state and federal emissions rules[,]" First Wind asserts that it is an "important partner in the PSIPs."[199]

First Wind states that: it "is interested in this Docket [A]s a developer, owner, and operator of utility-scale renewable energy projects[,]" and the "decisions to be made in this Docket could significantly harm or advance First Wind's interest."[200]

B.

Regulatory Provisions

HAR § 6-61-55 states, in pertinent part:

> (a) A person may make an application to intervene and become a party by filing a timely written motion in accordance with sections 6-61-15 to 6-61-24, section 6-61-41, and section 6-61-57, stating the facts and reasons for the proposed intervention and the position and interest of the applicant.
>
> (b) The motion shall make reference to:

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[198]"Motion To Intervene Of First Wind Holdings, LLC, Affidavit Of Paul J. Gaynor, And Certificate Of Service," filed on Aug. 27, 2014 ("First Wind Motion"), at 5.

[199]First Wind Motion at 5.

[200]First Wind Motion at 7, 9.

(1) The nature of the applicant's statutory or other right to participate in the hearing;

(2) The nature and extent of the applicant's property, financial, and other interest in the pending matter;

(3) The effect of the pending order as to the applicant's interest;

(4) The other means available whereby the applicant's interest may be protected;

(5) The extent to which the applicant's interest will not be represented by existing parties;

(6) The extent to which the applicant's participation can assist in the development of a sound record;

(7) The extent to which the applicant's participation will broaden the issues or delay the proceeding;

(8) The extent to which the applicant's interest in the proceeding differs from that of the general public; and

(9) Whether the applicant's position is in support of or in opposition to the relief sought.

HAR § 6-61-55(d) further states that "[i]ntervention shall not be granted except on allegations which are reasonably pertinent to and do not unreasonably broaden the issues already presented." The general rule concerning the granting of intervention is well settled: intervention is not a guaranteed right of a movant, but is "a matter resting within the sound

discretion of the commission," so long as that discretion is not exercised arbitrarily or capriciously.[201]

C.

Commission Ruling

Upon careful review of the record, and having given due consideration to the arguments advanced, the commission: (a) denies the motions to intervene of REACH, LOL, NextEra Hawaii, HSEA, Puna Pono, TASC, HREA, Hawaii Gas, AES, Blue Planet, Ulupono, HPVC, Sierra Club, Tawhiri, SunPower, Paniolo Power, Eurus, and First Wind, and, on its own motion, grants participant status to the foregoing movants; and (b) grants the motions to intervene of COM, DBEDT, and COH.

1.

Denying Motions to Intervene and Granting Participant Status to Certain Movants

The commission denies the motions to intervene of REACH, LOL, NextEra Hawaii, HSEA, Puna Pono, TASC, HREA, Hawaii Gas, AES, Blue Planet, Ulupono, HPVC, Sierra Club, Tawhiri, SunPower, Paniolo Power, Eurus, and First Wind and, on its own motion,

[201] In re Application of Hawaiian Elec. Co., Inc., 56 Haw. 260, 262-263, 535 P.2d 1102, 1104 (1975).

grants participant status to the foregoing movants. In support of this conclusion, the commission finds as follows:

1. The Hawaii Supreme Court has stated that "[i]ntervention as a party in a proceeding before the PUC is not a matter of right but is a matter resting within the sound discretion of the commission."[202] "This rule, however, is always subject to the essential qualification that this discretion is not to be arbitrarily and capriciously exercised."[203]

2. In addition, HAR § 6-61-55(d) provides that "[i]ntervention shall not be granted except on allegations which are reasonably pertinent to and do not unreasonably broaden the issues already presented."

3. Originally, on August 7, 2014, the commission issued Order No. 32269 stating that "[p]ursuant to [Hawaii Revised Statutes ("HRS")] §§ 269-6 and 269-7, this proceeding is instituted to review the PSIPs of each of the HECO Companies."[204]

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[202]Application of Hawaiian Elec. Co., 56 Haw. 260, 262, 535 P.2d 1102, 1104 (1975) (emphasis added).

[203]Hawaiian Elec., 56 Haw. at 263, 535 P.2d at 1104.

[204]"Order No. 32257 Initiating A Proceeding To Review The HECO Companies' Power Supply Improvement Plans," filed on August 7, 2014.

4. HRS §§ 269-6 and 269-7 state that the commission has "general supervision" "over all public utilities"[205] and "shall have power to examine into the condition of each public utility, the manner in which it is operated . . . and all matters of every nature affecting the relations and transactions between it and the public or persons or corporations."[206]

5. The commission's inherent authority to ensure the orderly conduct of proceedings and to avoid undue delay and unnecessary duplication of effort, along with the applicable statutes that gave rise to this proceeding, broadly empower the commission to define the scope of the docket, and to determine whether - in balancing the needs of the commission, the affected utilities, and the public's interest in the timely and efficient resolution of the energy-policy matters at issue - intervention or participant status should be granted.

6. The commission "may permit participation without intervention" to a movant "who has a limited interest" and demonstrates "expertise, knowledge or experience" with regard to the matter at issue.[207] However, to be granted intervenor status

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[205]HRS § 269-6(a) (2007 Repl.).

[206]HRS § 269-7(a) (2007 Repl.).

[207]HAR § 6-61-56(a), (b), and (c)(5).

and "become a party[,]"[208] a motion to intervene must be supported by more than conclusory assertions or the mere recitation of the language of HAR § 6-61-55.

7. This proceeding focuses on the interests of the public, in general, and the ratepayers in particular, and whether and how the PSIPs of the utilities identify strategies to "lower and stabilize customer bills[,]" to "integrate a diverse portfolio of cost-effective renewable energy projects[,]" and to "operate each island grid reliably and cost-effectively with substantial quantities of variable renewable energy resources[.]"[209]

8. The commission observes that while some movants state that they seek to protect the public interest and advocate on behalf of a certain constituency, the Consumer Advocate is statutorily required to, and, thus, will adequately "represent, protect, and advance the interests of all consumers, including small businesses, of utility services."[210] By statute,

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[208]HAR § 6-61-55(a).

[209]Order No. 32294 at 4.

[210]See, e.g., In re Hawaiian Elec. Co., Inc., Docket No. 2009-0155, Order Denying Intervention and Granting Participant Status to Life of the Land, filed on Sept. 11, 2009 ("Sept. 11, 2009 Order"), at 17 ("LOL's assertion, moreover, that LOL's interests differ from that of the general public, is not convincing. LOL's argument that separate representation is

the Consumer Advocate is an ex officio party to this proceeding, pursuant to HRS § 269-51 and HAR § 6-61-62(a).

9. The commission intends to continue its practice of permitting and encouraging participation by a broad spectrum of stakeholders in investigatory proceedings for the purposes stated above. The commission finds that a broad spectrum of perspectives may assist in the development of a sound record and that certain movants may contribute their "expertise, knowledge or experience"[211] and thereby assist in the commission's review of the issues in this docket.

10. As discussed above, in exercising its discretion with respect to intervention, the commission also has the authority to grant a movant participant status in lieu of intervention.[212]

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necessary since consumer and environmental issues are distinct and that this divergence is sufficient to justify intervention is not persuasive. . . . Contrary to LOL's assertions, the Consumer Advocate is not limited solely to advocating for consumer-type interests, as the Consumer Advocate is also statutorily required to 'consider the long-term benefits of renewable resources in the consumer advocate's role as consumer advocate." (citing HRS § 269-54(c)).

[211]HAR § 6-61-56(b)(5).

[212]See HAR § 6-61-56 ("The commission may permit participation without intervention."); Sept. 11, 2009 Order at 14-15 (denying intervention but granting "limited involvement in this proceeding as a participant" because it may "assist the commission in its review and understanding of this issue").

11. The commission denies the motion to intervene to each of the following movants: REACH, LOL, NextEra Hawaii, HSEA, Puna Pono, TASC, HREA, Hawaii Gas, AES, Blue Planet, Ulupono, HPVC, Sierra Club, Tawhiri, SunPower, Paniolo Power, Eurus, and First Wind.

12. Instead, on its own motion, the commission grants participant status to each of the following: REACH, LOL, NextEra Hawaii, HSEA, Puna Pono, TASC, HREA, Hawaii Gas, AES, Blue Planet, Ulupono, HPVC, Sierra Club, Tawhiri, SunPower, Paniolo Power, Eurus, and First Wind.

13. Participants will be allowed - and are encouraged - to present analysis, testimony, statements of position, and reply statements of position as may be specifically allowed or required in further orders in this docket. Participants shall not be permitted to file motions or responses concerning procedural and legal matters (such as those pertaining to scheduling, future changes in the scope of the proceeding, or other matters pertaining to the conduct of the proceeding), except as specifically allowed by the commission. In addition, the scope and form of allowed discovery for Parties, Intevenors and Participants will be governed by further order of the commission.

2.

Granting the Motions to Intervene of COM, DBEDT and COH

The commission grants the motions to intervene of COM, DBEDT, and COH.

14. The commission finds and concludes that in contrast to the other movants, these government entities are statutorily mandated to act in energy-policy areas and officially represent the interests within the scope of their respective mandates.

15. For example, COM states that its participation "will help to ensure that the PSIPs are thoroughly reviewed for relevancy from a community-based, local government perspective."[213]

16. Similarly, COH states that it "continues to intervene to ensure that future decisions pass economic and technological rigor and are community friendly and cost effective in order to enable a sustainable quality of life and healthy economy for all our residents"[214] and "the PSIPs, if not developed and analyzed correctly, could potentially jeopardize the future of all electric ratepayers, taxpayers, and water ratepayers on the island.[215]

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[213]COM Motion at 3 (citing HRS § 46-1.5).

[214]COH Motion at 4.

[215]COH Motion at 2. The commission further observes that like COM, COH has the powers and duties set forth in HRS § 46-1.5.

17. Likewise, DBEDT explains that it "has a statutory obligation to coordinate the State's development of . . . renewable energy resources"[216] and the "instant docket impacts the essential missions and obligations of [DBEDT]."[217] Furthermore, DBEDT states that it "is a relevant, helpful and necessary party to the proceeding" because it "has a clear interest in and value to the proceeding as the representative of the State's policy objectives and public good" and "only [DBEDT] can provide that larger economic and taxpayer perspective, including promotion of economic development[.]"[218]

18. Pursuant to HRS Chapter 269, the commission has pervasive authority over public utilities, including the utility planning matters considered in the PSIPs. In this regard, the commission recognizes that statutory duties of DBEDT, COH, and COM require that these movants consider and address many of the issues in this docket, and concludes that in the exercise of these duties, these movants will assist the commission in its

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[216]DBEDT Motion at 12 (citing HRS § 26-18(a) (stating that DBEDT shall "undertake energy development and management"), HRS § 193-3 (appointing the DBEDT Director to serve as the "energy resources coordinator"), and HRS § 193-4 (describing the powers and duties of the energy resources coordinator)).

[217]DBEDT Motion at 3.

[218]DBEDT Motion at 4-5, 11.

investigation. The commission therefore grants Intervenor status to DBEDT, COH, and COM.

19. Except as specifically otherwise noted, the term "Parties" used in this Order refers collectively to the Parties, Intervenors, and Participants in this proceeding.

D.

Conditions of Intervention or Participation

The commission cautions the Parties permitted herein that their participation will be limited to the issues as established by the commission in this docket. Moreover, the commission reminds all Parties that it is imperative that their involvement in this docket reflect a high standard of quality, relevance, and timeliness.

> The commission advises that the investigation to be conducted in this docket will require detailed analysis and discussion of various technical, economic, and policy issues concerning [PSIPs].
>
> . . . [I]ntervenors or participants must be prepared to address these issues in depth and to meaningfully participate in the discussion and resolution of same.[219]

[219] In the Matter of PUBLIC UTILITIES COMMISSION, Instituting a Proceeding to Investigate Distributed Energy Resource Policies, Docket No. 2014-0192, ("Instituting A Proceeding To Investigate Distributed Energy Resource Policies,") filed on August 21, 2014 ("Order No. 32269"), at 6-7.

Insofar as the matters in this docket "require[d] specialized knowledge," the commission's decision to allow [each party] to intervene [or participate] is based, to a significant extent, on [each party's] assurances that it will provide meaningful assistance to the commission."[220]

To that end, each party's respective intervenor or participant status is conditioned on the requirement that each party "possess expertise with respect to [PSIP] issues" or "retain consultants that have" "engineering, economic, and policy expertise commensurate with the highly complex and technical nature of these interrelated issues[,]" so that the matters concerning PSIPs "can be addressed in both a comprehensive and timely fashion."[221] Furthermore, the commission encourages parties to submit alternative analyses and analytical methods into the record that will support development of final PSIPs.

Finally, the commission will preclude any attempts to broaden the issues or to unduly delay the proceeding, and will reconsider any Intervenor's or Participant's inclusion in this

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[220]In the Matter of the Application of Kauai Island Utility Cooperative, For Approval of Rate Changes and Increases, Revised Rate Schedules and Rules, and Other Ratemaking Matters, Docket No. 2009-0050, ("Order Granting Intervention To Essex House Condominium Corporation On Behalf Of Kauai Marriott Resort & Beach Club,") filed on October 6, 2009, at 19.

[221]Order No. 32269 at 7-8.

docket if, at any time during the course of this proceeding, the commission determines that any Intervenor or Participant is attempting to unreasonably broaden the pertinent issues established by the commission in this docket, is unduly delaying the proceeding, or is failing to meaningfully participate and assist the commission in the development of the record in this docket.

VIII.

SCHEDULE OF PROCEEDINGS

The following schedule is provided for the next phase of this proceeding to provide for review, supplementation, amendment and updating of the PSIP for each of the HECO Companies.

1) On or before November 25, 2015, the HECO Companies shall file: comments regarding the Initial Statement of Issues in this Order; preliminary responses to the Observations and Concerns identified in Section VI. of this Order; and a Proposed PSIP Revision Plan ("Revision Plan"). The Revision Plan shall include a Schedule and a Work Plan to supplement, amend, and update the PSIPs in order to address the commission's Observations and Concerns and the substance of the Initial Statement of Issues identified in this Order, including but not limited to the observations, concerns, considerations and issues identified

in Attachment A to this Order. The Revision Plan shall include provisions to receive, consider and, as appropriate, incorporate information, comments and analyses filed by the Parties in this docket, and provide a timeline that includes an interim PSIP Update on or before February 15, 2016. The interim PSIP Update shall present preliminary or interim results of the Companies' supplemental planning analyses and include pertinent available supplemental information to address the commission's Observations and Concerns and the initial responses of Parties. The Revision Plan shall endeavor to provide for filing of supplemented, amended and updated PSIPs by April 1, 2016.

2) On or before January 15, 2016, Parties other than the HECO Companies shall file: initial responses to the HECO Companies' PSIPs;[222] comments regarding the commission's Observations and Concerns and Initial Statement of Issues identified in this Order; and comments regarding the HECO Companies' comments and preliminary responses and Proposed PSIP Revision Plans. The Parties are encouraged to offer specific recommendations or analyses that will assist in the development of the HECO Companies' supplemented, amended and updated PSIPs.

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[222]The commission observes that several Parties have already filed comments in this docket on the HECO Companies' PSIPs. The commission encourages those Parties to consider providing supplemental comments to the reflect changes in circumstances and their respective positions since the filing of the PSIPs.

3) After review of the filings required above, the commission will provide further guidance regarding the substance and course of this proceeding.

4) The commission may convene technical meetings to further examine and understand the filings in this proceeding, including any supplemental analyses provided by the HECO Companies or other Parties.

IX.

ORDERS

THE COMMISSION ORDERS:

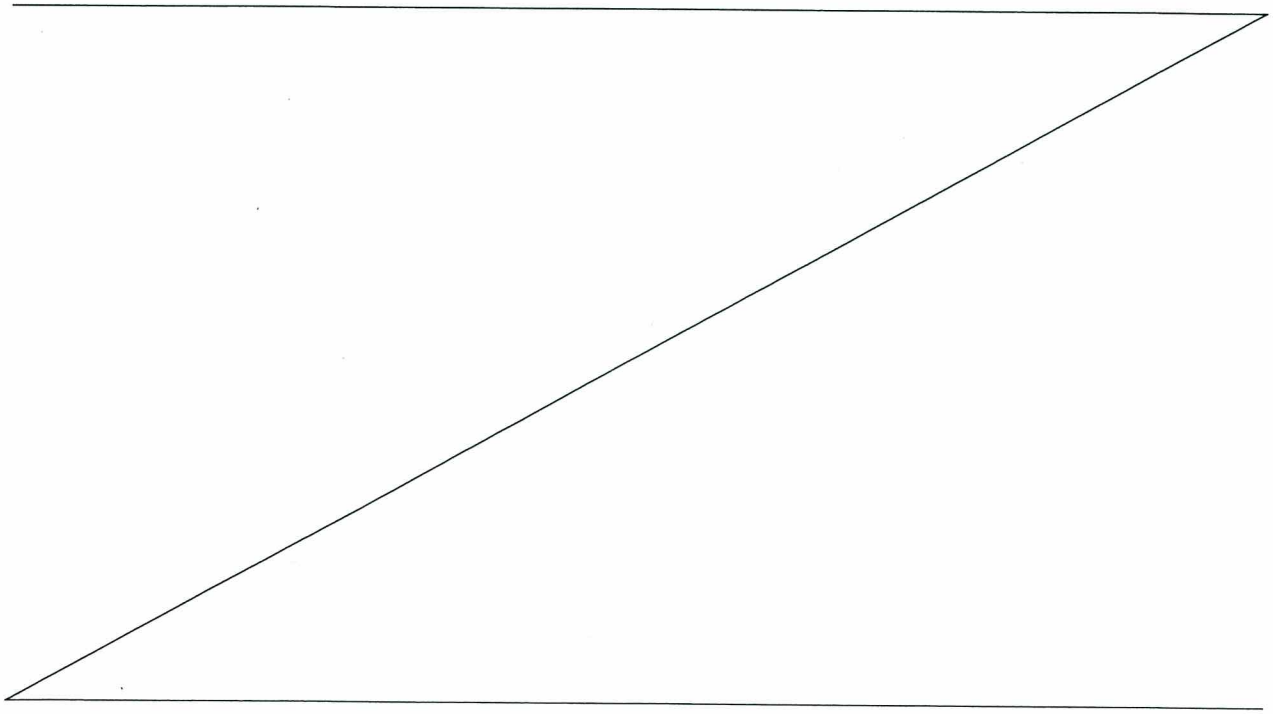
1. The motions to intervene of REACH, LOL, NextEra Hawaii, HSEA, Puna Pono, TASC, HREA, Hawaii Gas, AES, Blue Planet, Ulupono, HPVC, Sierra Club, Tawhiri, SunPower, Paniolo Power, Eurus, and First Wind are denied.

2. By motion of the commission (*sua sponte*), movants REACH, LOL, NextEra Hawaii, HSEA, Puna Pono, TASC, HREA, Hawaii Gas, AES, Blue Planet, Ulupono, HPVC, Sierra Club, Tawhiri, SunPower, Paniolo Power, Eurus, and First Wind, are granted participant status in this docket subject to the provisions and conditions specified above.

3. The motions to intervene of COM, DBEDT, and COH are granted subject to the conditions specified above.

4. On or before November 25, 2015, the HECO Companies shall file, in accordance with the Schedule of Proceedings in this Order: comments regarding the Initial Statement of Issues in this Order; preliminary responses to the Observations and Concerns identified in Section VI. of this Order; and a Proposed PSIP Revision Plan.

5. On or before January 15, 2016, Parties other than the HECO Companies shall file: initial responses to the HECO Companies' PSIPs; comments regarding the commission's Observations and Concerns and Initial Statement of Issues identified in this Order; and comments regarding the HECO Companies' comments, preliminary responses and Proposed PSIP Revision Plans required above.



6. The HECO Companies shall supplement, update and amend the PSIPs, as appropriate, as directed in this Order and in accordance with the Schedule of Proceedings in this Order as it may be amended in this proceeding.

DONE at Honolulu, Hawaii NOV - 4 2015.

PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

By _____
Randall Y. Iwase, Chair

By _____
Michael E. Champley, Commissioner

By _____
Lorraine H. Akiba, Commissioner

APPROVED AS TO FORM:

_____
Thomas C. Gorak
Commission Counsel

2014-0183.ljk

Attachment 1. Issues and Considerations To Be Included in the PSIP Revision Plans

Observations and Concerns	Planning and Analysis Considerations	Near-Term Issues [2015 – 2020]	Mid to Long-Term Issues [2021 – 2045]
PSIP Cost Impacts and Risks Have Not Been Demonstrated to be Reasonable • Characterization of PSIP costs and rate impacts appears misleading • Rely on uncertain presumed cost-saving measures • Plans require extensive and possibly problematic amounts of capital expenditure	• "All-in" analysis of costs and rate impacts of proposed plans • Present full, clear, forthcoming, unbiased set of metrics to characterize costs and rate impacts of the proposed plans • Explicit consideration of uncertainties in key factors affecting PSIP costs (e.g., LNG and renewable costs)	• Cost and rate impacts of PSIP near-term actions • Analysis of costs and rate impacts to meet higher 2020 RPS requirements • Cost and rate impacts under alternative assumptions about LNG and renewables	• Cost and rate impacts of mid- to long-term actions to implement cost-effective high renewable strategy to achieve Act 97 RPS requirements
PSIPs Do Not Appear to Aggressively Seek Lower-Cost, New Utility-Scale Renewable Resources • Do not appear to maximize use of cost-effective renewables • Claimed 65% renewable achievement relies on high-cost and uncertain renewable resources • Assumed technology costs and constraints on renewable resources lack justification and appear conservative	• Optimization of renewable resource portfolio alternatives considering full potential of available renewable resource options without unsubstantiated constraints • Updated technology cost and resource assumptions • Explicit identification and consideration of renewable resource integration costs in the determination of optimal mix of system resources	• Cost-effective integration of approved and pending renewable resources and the DG-PV queue • Identify actions to support acquisition of near-term cost-effective RE projects to meet 2020 RPS • DER system-level hosting capacity analysis • Develop and implement Lanai and Molokai High RE plans	• Develop strategic direction and decision rules for cost-effective high renewable strategy to achieve Act 97 RPS requirements

Observations and Concerns	Planning and Analysis Considerations	Near-Term Issues [2015 – 2020]	Mid to Long-Term Issues [2021 – 2045]
• Costs to integrate renewable resources are not clearly addressed	• Explicit identification and consideration of key enabling technologies to support high renewable strategy (e.g., bulk energy storage)		
PSIPs Do Not Adequately Address Utilization and Integration of DER • Consider full spectrum of DER, including demand response, energy efficiency, electric vehicles, generation and storage • Near-term strategy to utilize DER for ancillary services and reduce G,T, & D investment	• Evaluate full spectrum of DER in analysis of optimal resource portfolios • Include DER in overall system optimization instead of "treating DG-PV as an end state" • Explicit consideration of integration costs	• Determine high-value system-level use cases for utilization of DER for near-term applications • Identify cost-effective opportunities to retrofit/upgrade existing DER • Opportunities to aggregate DER to provide locational benefit (e.g., South Maui)	• Consider the role and potential contribution of DER resources in high-RPS attainment scenarios
Proposed Plans for Fossil-Fueled Power Plants are not Sufficiently Justified • Fossil generation retirement plan has not been adequately justified • Operational flexibility upgrades • LNG and fuel use strategies	• Provide analyses required in Order No. 32053 at 92-93 for a "Fossil Generation Retirement Plan" for each company • Provide analyses required in Order No. 32053 at 101 for a "Generation Commitment and Economic Dispatch Review" for each company	• Review Companies' near-term strategies for cost-effective fossil generation retirements and flexibility improvements • Review Companies' near-term fuel supply strategies to minimize fuel cost and price	• Cost-effective fossil generation replacement plan consistent with high renewable strategy to achieve Act 97 RPS requirements • Long-term fuel supply strategy to minimize

Observations and Concerns	Planning and Analysis Considerations	Near-Term Issues [2015 – 2020]	Mid to Long-Term Issues [2021 – 2045]
• Least-cost security-constrained economic dispatch policies are not sufficiently transparent	• Evaluate fossil generation plans considering alternate LNG price scenarios and scenarios with and without bulk scale and container scale LNG fuel utilization • Provide explicit identification and quantification of benefits of new, highly-efficient, flexible generating units	volatility risk, including proposed LNG use • Review Companies' environmental compliance strategies • Review economic dispatch policies for each system and clarify dispatch of units using renewable fuels (Schofield, CT-1, and AES proposal)	fuel cost and price volatility risk
System Security Requirements Appear Costly and Are Not Sufficiently Justified • Technical bases for requirements is not clearly established and defined in technology-neutral terms • Proposed security and reliability requirements appear costly • Appear likely to limit utilization of and increase costs to integrate renewables	• Determine technology-neutral grid service requirements • Review and evaluate costs of existing must run/system security constraints • Demonstrate proposed security requirements are reasonable, cost-effective, balance system reliability, and provide for utilization of clean energy resources	• Determine grid service requirements for known and likely RE additions on each island system • Identify reasonable, cost-effective near-term system security requirements	• Determine grid service requirements for high renewable penetration strategies

Observations and Concerns	Planning and Analysis Considerations	Near-Term Issues [2015 – 2020]	Mid to Long-Term Issues [2021 – 2045]
Proposed Plan for Provision of Ancillary Services Lacks Transparency and May Not be Most Cost-Effective Option • Have not demonstrated cost-effective ancillary service resource portfolio • Analytical methods appear flawed	• Utilize technology-neutral criteria to evaluate ancillary service resource alternatives • Evaluate and consider potential contributions from all potential sources of ancillary services including DER, demand response, and renewable generation, etc. • Utilize modeling and analysis tools and methods that are appropriate and accurately measure ancillary service efficacy and costs	• Review of proposed energy storage resources to determine and demonstrate optimal, cost-effective sizing and utilization strategies • Identify and analyze cost-effective near-term strategies to meet ancillary service needs on each island system	• Determine cost-effective portfolio of ancillary service resources for high renewable penetration strategies
PSIP Analysis on Inter-Island Transmission Lacks Sufficient Detail • Consistent consideration of benefits and costs • Disparities with other analyses	• Provide appropriate and consistent consideration of benefits and costs • Consider a full spectrum of costs and benefits • Address and explain the disparities in the various analyses of inter-island transmission submitted to the commission		• Evaluate the need and economics of inter-island transmission options in high renewable strategy to achieve Act 97 RPS requirements
Customer and Implementation Risks Are Not Adequately Addressed • Customer impacts and risks of key uncertainties not identified or addressed	• Provide appropriate sensitivity analyses and risk assessments to assess the impacts of principal uncertainties on major decisions	• Consideration of uncertainties associated with prices and feasibility of utilization of LNG fuels	• Customer and implementation risk assessment for cost-effective high renewable strategy to

Observations and Concerns	Planning and Analysis Considerations	Near-Term Issues [2015 – 2020]	Mid to Long-Term Issues [2021 – 2045]
• Customer risks associated with proposed capital program not identified or addressed • Capital program implementation risks not identified or addressed	• Characterization of project implementation risks, assessment of Companies' abilities to finance and manage proposed capital expansion program, and measures to insulate customers from implementation risks	• Risk assessment of potential for cost overruns in period with rapid capital spending increase • Assessment of financial impact of proposed capital program	achieve Act 97 RPS requirements

CERTIFICATE OF SERVICE

The foregoing order was served on the date of filing by mail, postage prepaid, and properly addressed to the following parties:

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