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JAY IGNACIO, P. E.
President

January 29, 2016

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PUBLIC UTILITIES COMMISSION

The Honorable Chairman and Members of the
Hawai'i Public Utilities Commission
465 South King Street
Kekuanaoa Building, Room 103
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Adequacy of Supply
Hawai'i Electric Light Company, Inc. ("Hawai'i Electric Light" or "Company")

The following information is respectfully submitted in accordance with paragraph 5.3a of General Order No. 7, which states:

> *The generation capacity of the utility's plant, supplemented by electric power regularly available from other sources, must be sufficiently large to meet all reasonably expectable demands for service and provide a reasonable reserve for emergencies. A Statement shall be filed annually with the Commission within 30 days after the close of the year indicating the adequacy of such capacity and the method used to determine the required reserve capacity which forms the basis for future requirements in generation, transmission, and distribution plant expansion programs required under Rule 2.3h.1.*

2016 Adequacy of Supply Report Summary

- Hawai'i Electric Light's generation capacity for the next three years (2016 – 2018) will be sufficient to meet reasonably expected demands for service and provide reasonable reserves for emergencies.

- The peak load experienced on the Big Island in 2015 was 191.5 MW net, and was served by Hawai'i Electric Light's total capability of 273.55 MW net, including firm power purchases. This represents a reserve margin of approximately 43% over the 2015 system net peak.

1. Peak Demand and System Capability in 2015

Hawai'i Electric Light's 2015 system peak occurred on December 28, 2015,[1] at

[1] Hawai'i Electric Light's system peak in 2015 occurred in the month of December. Typically, Hawai'i Electric Light's system peaks have occurred in the month of December. For the purposes of this report, it is assumed that Hawai'i Electric Light's future annual system peak will occur in December.

approximately 6:26 pm and was 191.5 MW net based on net generation exclusive of unmeasured distributed generation.

Hawai'i Electric Light's 2015 total firm generating capability of 273.5 MW net includes 34.6 MW from Puna Geothermal Venture ("PGV")[2] and 60 MW from Hamakua Energy Partners, L.P. ("HEP")[3].

The Hawai'i Electric Light system had a reserve margin of approximately 43% over the 2015 system peak net demand.[4]

At times during 2015, Hawai'i Electric Light received energy from several utility and independent power producer variable generation energy providers (i.e., Tawhiri Wind, Wailuku River Hydroelectric, Hawi Renewable Development, and several Feed-in-tariff solar projects). Since these contracts are for variable, as-available energy, they are not reflected in Hawai'i Electric Light's total firm generating capacity.

2. Estimated Reserve Margins

Appendix 1 shows the expected reserve margin over the next three years, 2016-2018, based on Hawai'i Electric Light's May 2015 Sales and Peak Forecast ("May 2015 Forecast"), and includes estimated self-generation, customer battery and energy efficiency impacts. No forecasted demand response impacts are included.

3. Criteria to Evaluate Hawai'i Electric Light's Adequacy of Supply

Hawai'i Electric Light's capacity planning criteria are applied to determine the adequacy of supply - whether or not there is enough generating capacity on the system. Hawai'i Electric Light's capacity planning criteria take into account that the Company must provide for its own backup generation since, as an island utility, it cannot import emergency power from a neighboring utility. Hawai'i Electric Light's capacity planning criteria are described in Section 3.1.

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[2] The PGV additional 8 MW facility was placed in-service on March 19, 2012. PGV's total capacity was increased from 30 MW to 34.6 MW based on completed acceptance testing. PGV's output has been derated below 34.6 subsequent to Tropical Storm Iselle, and at the time of the December system peak was 26.6 MW. PGV continues performing work to restore capacity. According to Article 5 of the PPA for the expansion, PGV has an opportunity to use commercially reasonable efforts to increase the facility's capacity level to the committed capacity of 38 MW. For the purposes of this report, PGV's capacity of 34.6 MW is assumed for the reserve margin calculation for 2016, and 38 MW for 2017 and 2018.

[3] On December 22, 2015, Hawaii Electric Light entered into an agreement, subject to PUC approval, to acquire the assets of HEP for approximately $84.5 million.

[4] The total capability value used in the calculation of this reserve margin does not account for units not available due to maintenance outages, forced outages, or derates in unit capacities.

3.1. Hawai'i Electric Light's Capacity Planning Criteria

The following capacity planning criteria is used to determine the need for additional generation:

Rule 1:

The total capability of the system must at all times be equal to or greater than the summation of the following:

a. *the capacity needed to serve the estimated system peak load, less the total amount of interruptible loads;*

b. *the capacity of the unit scheduled for maintenance; and*

c. *the capacity that would be lost by the forced outage of the largest unit in service.*

Reserve Margin:

Consideration will be given to maintaining a reserve margin of approximately 20% based on Net Top Load ratings.

Reserve Margin Sensitivity:

In Hawai'i Electric Light's Power Supply Improvement Plan filed on August 26, 2014, [5] *a proposed reserve margin planning standard of 30% was used for capacity planning analysis.* [6]

3.2. Other Considerations in Determining the Timing of Unit Additions

The need for new generation is not based solely on the application of the criteria previously mentioned. As capacity needs become imminent, it is essential that Hawai'i Electric Light broaden its consideration to ensure timely installation of generation capacity necessary to meet its customers' energy needs.

Other near-term considerations may include:

1. the current condition and rated capacity of existing units;

[5] Order No. 32290 issued on September 12, 2014, transferred Hawai'i Electric Light's Power Supply Improvement Plan report from Docket No. 2012-0212 into Docket No. 2014-0183.
[6] Refer to Appendix M of Hawai'i Electric Light's Power Supply Improvement Plan report for reference.

2. required power purchase obligations and contract terminations;

3. the uncertainties surrounding non-utility generation resources;

4. the uncertainties surrounding new energy and generation resources;

5. transmission system considerations;

6. meeting environmental compliance standards; and

7. stability considerations for Hawai'i Electric Light's isolated electrical system.

As an example of consideration number 4 above, transmission line outages during Tropical Storm Iselle in August 2014, and again, during a windstorm on January 2 and 3, 2015 caused, at various points during the storm, non-utility generators PGV and HEP, which comprise a significant portion of the generation capacity for Hawaii Island, to be separated from the main portion of the transmission grid due to multiple transmission line outages. The transmission line outages were due to sustained equipment damage from trees which required lengthy repairs. The Hawaii transmission system is also at risk as the Company's two main transmission lines, the 8700 and 6500 lines, and a sub-transmission line, the 3700 line, are in the potential path of the June 27, 2014 Kilauea lava flow. These lines provide power to the Lower Puna area and are the interties for the 34.6 MW of firm renewable energy generated by PGV. If the intertie lines are inoperable, PGV would not be able to export power to the rest of the grid.[7] The lessons learned from these events drove plans for:

a) evaluating designs to allow the generation system in two or more islands,

b) increasing expenditures on line hardening and tree trimming projects,

c) projects to synchronize breakers to connect to live islands during restoration, and

d) retaining sufficient capacity to recover from multiple transmission line outages and isolation of large resources such as PGV and/or HEP.

This last plan, d), shows that increased capacity margin for the known potential for capacity loss during storms and lava impacts is prudent until such time that the transmission line risks can be mitigated; this is a consideration in unit operational decisions including the potential seasonal cycling and deactivation of generating unit assets.

In the application of Hawai'i Electric Light's capacity planning criteria that are used to determine its adequacy of supply, the inputs drive the results. Two of the key inputs in the application of the capacity planning criteria are (1) projected peak demand (including the

[7] Docket No. 2015-0074, Hawaii Electric Light's application for approval to record lava flow related costs as a deferred debit, at 12.

anticipated peak reduction benefits of energy efficiency demand side management programs) and (2) the total firm capacity on the system. These key inputs are described in the following sections.

4. Key Inputs to the 2016 Adequacy of Supply Analysis

4.1 May 2015 Forecast

Hawai'i Electric Light developed its sales and peak forecast in May 2015, which was subsequently adopted by the Company for future planning purposes and used for this analysis.

Hawai'i Electric Light May 2015 Forecast	
Year	Peak, Net MW
2016	186.1
2017	186.4
2018	187.6

4.2 Projected Peak Reduction Benefits of Demand Response Programs

Hawai'i Electric Light is committed to pursuing Demand Response ("DR") programs designed to provide cost-effective resource options to meet the capacity needs and support the reliable operation of the system, as identified in the Hawaiian Electric Companies[8] Integrated Demand Response Portfolio Plan ("IDRPP") filed on July 28, 2014, Update filed March 31, 2015, and Supplement filed November 20, 2015, in Docket No. 2007-0341.

On December 30, 2015, the Hawaiian Electric Companies submitted to the Commission for approval an interim Application (Docket 2015-0412) requesting:

- Approval of proposed tariff structure for DR programs;
- Approval of cost recovery mechanism;
- Approval of a 2-year program and budget approval cycle; and,
- Approval of the Companies' proposed reporting structure.

There is no Hawai'i Electric Light DR Portfolio in the interim Application and for the purposes of the analysis in this report, the peak reduction benefits of DR were assumed to be zero. An update to the interim Application, to be filed in mid-2016, will publish finalized DR program design and targets (MW) following the Power Supply Improvement Plan ("PSIP) update filing in April 2016. Pending Commission approval of the program application, the next AOS filing will be updated with the revised program load amounts within the final Application. Hawai'i Electric Light will continue to implement DR in accordance with these targets in future

[8] Hawaiian Electric Company, Inc., Maui Electric Company, Limited., and Hawai'i Electric Light Company Inc., collectively referred to as the Hawaiian Electric Companies

years.

4.3 Planned Maintenance Schedules For The Generating Units On The System

Planned outages and maintenance outages reduce generating unit availabilities. The schedules for planned overhaul and maintenance outages change frequently due to unforeseeable findings during outage inspections or to changes in priorities due to unforeseeable problems. When major revisions to planned and/or maintenance outages occur, the Planned Maintenance Schedule is revised.

4.4 Additions of Capacity

4.4.1 Firm Capacity Additions

On December 20, 2013, the Commission issued Decision and Order No. 31758 in Docket No. 2012-0212, approving the Power Purchase Agreement ("PPA") between Hawai'i Electric Light and Hu Honua Bioenergy, LLC ("Hu Honua"). For the purposes of this report, it is anticipated that Hu Honua may be in service in 2017.

4.4.2 Non-Firm Capacity Additions

No non-firm capacity additions are planned at this time.

4.5 Reductions of Firm Generating Capacity

Hawai'i Electric Light Units Shipman 3 and Shipman 4 were placed in "inactive" status (dry layup) on November 21, 2013. These units were retired as of December 31, 2015 and their capacities (a combined 14.4 MW net) removed from the reserve margin calculation.

Although listed as a candidate for possible retirement in the future if system conditions and cost impacts allow, for the purposes of this report, the capacity provided by the Puna unit has been retained for all years analyzed.

4.6 Changes to Existing Generating Capacity

The capacity of certain diesel units was reduced from 2.75 MW (reserve rating) to 2.50 MW (normal top load rating) MW. This was because they could only reach their reserve ratings for very short periods of time, if at all. The units affected were D12/13/14 at Waimea, D15/16/17 at Kanoelehua, and D21/22/23 at Keahole.

The following dispersed diesel units were increased in capacity from 1.00 to 1.25 MW: Kapoho DG1/Ouli D25/Punaluu D26/Kapoho DG2.

4.7 Table of Generating Unit Capacities

NTL Ratings in Net MW are used for reserve margin calculation.

Hawai'i Electric Light Adequacy of Supply
2015 Unit Ratings (Firm Capacity at Forecasted System Peak in December 2015)

	(in Gross MW)		(in Net MW)	
Unit ID	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	17.00	17.00	15.70	15.70
Kanoelehua D11	2.00	2.00	2.00	2.00
Waimea D12	2.75	2.50	2.75	2.50
Waimea D13	2.75	2.50	2.75	2.50
Waimea D14	2.75	2.50	2.75	2.50
Kanoelehua D15	2.75	2.50	2.75	2.50
Kanoelehua D16	2.75	2.50	2.75	2.50
Kanoelehua D17	2.75	2.50	2.75	2.50
Keahole D21	2.75	2.50	2.75	2.50
Keahole D22	2.75	2.50	2.75	2.50
Keahole D23	2.75	2.50	2.75	2.50
Kanoelehua CT1	11.50	11.50	11.50	11.50
Keahole CT2	13.80	13.80	13.80	13.80
Puna CT3	21.00	21.00	21.00	21.00
Keahole CT4/CT5/ST7	58.50	58.50	56.25	56.25
Kapoho DG1	0.00	0.00	0.00	0.00
Ouli D25	1.25	1.25	1.25	1.25
Punaluu D26	1.25	1.25	1.25	1.25
Kapoho DG2	0.00	0.00	0.00	0.00
HELCO total	186.55	184.30	181.20	178.95
PGV	34.60	34.60	34.60	34.60
Hu Honua, (in svc 2017)	0.00	0.00	0.00	0.00
HEP	60.00	60.00	60.00	60.00
Firm IPP Total	94.60	94.60	94.60	94.60
Firm Total	281.15	278.90	275.80	273.55

5. Power Supply Improvement Plan Reserve Margin Analysis

In the Reserve Margin Sensitivity Analysis, margins are still well above the proposed 30% guideline.

Year	System Capability at Annual Peak Load (net MW) [A]	System Peak (net MW) [B]	Variable Generation [C]	Reserve Margin (%) [A+C-B] [B]
2016	276.0	186.1	4.71	50.8%
2017	300.9	186.4	4.71	64.0%
2018	300.9	187.6	4.77	62.9%

6. Acquisition of Additional Firm Capacity

6.1 Competitive Bidding is the Required Acquisition Mechanism

On December 8, 2006, the Framework for Competitive Bidding ("CB Framework") was adopted by the Commission in Decision and Order No. 23121 ("D&O 23121") in Docket No. 03-0372, pursuant to HRS §§ 269-7 and 269-15, and Hawai'i Administrative Rules § 6-61-71. The Commission's CB Framework states that "[c]ompetitive bidding, unless the Commission finds it to be unsuitable, is established as the required mechanism for acquiring a future generation resource or a block of generation resources, whether or not such resource has been identified in a utility's Integrated Resource Plan."

6.1.1 Geothermal Request For Proposals

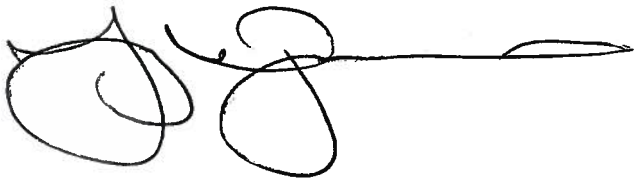
On May 1, 2012, the Commission opened Docket No. 2012-0092 to allow Hawai'i Electric Light to proceed with the competitive bidding process, in accordance with the Commission's December 8, 2006 CB Framework, to acquire up to 50 MW of dispatchable renewable geothermal firm capacity on the Island of Hawai'i. Hawai'i Electric Light filed the Proposed Final Geothermal Request For Proposal ("RFP") with the Commission on January 25, 2013 and issued the Final Geothermal RFP on February 28, 2013. On October 28, 2014, Hawai'i Electric Light filed the Geothermal RFP Addendum No. 1 (Best and Final Offer) and Attachment A (Best and Final Offer Bidder's Response Package). On February 24, 2015, Ormat was selected to provide an additional 25 MW of geothermal energy, and PPA contract negotiations began thereafter. Geothermal RFP information, including key filings and documents, may be found at http://GeothermalRFP.helcohi.com.

The forecasted service dates from this RFP are outside of the timeframe analyzed in this report. As can be seen from this filing, the desire to acquire geothermal energy is not for increasing generation capacity; but rather to acquire renewable energy at price that, with consideration of integration and infrastructure costs, will result in benefits to customers.

7. Conclusion

Hawai'i Electric Light's generation capacity for the next three years (2016 – 2018) will be sufficient to meet reasonably expected demands for service and provide reasonable reserves for emergencies.

Very truly yours,



Jay Ignacio
President

Attachment – Appendix 1

cc: Division of Consumer Advocacy (with Attachment)

Table 1
Adequacy of Supply

Year	System Capability at Annual Peak Load (net MW) [A] III, IV, V	System Peak (net MW) [B] I, II	Reserve Margin(%) [A-B] VI / [B]
2015	273.5	191.5	42.8%
2016	276.0	186.1	48.3%
2017	300.9	186.4	61.4%
2018	300.9	187.6	60.4%

Notes:

(I) System Peaks - The 2016-2018 annual forecasted system peaks are based on:

- Hawai'i Electric Light's May 2015 Forecast. The annual forecasted system peak is expected to occur in the month of December.
- The forecasted system peak values for the years 2016-2018 include estimated peak reduction benefits acquired through 2015 implemented by Hawai'i Energy, as well as the benefits of future energy efficiency programs, Rider M, and Schedule U contracts.

(II) System Peaks (Recorded):

- The recorded system peak for 2015 includes the actual peak reduction benefit of the acquired energy efficiency programs and the Rider M and Schedule U contracts.

(III) System Capability for 2015 includes:

- Hawai'i Electric Light units at a total of 178.95 MW net.
- Firm independent power purchase contracts with a combined net total of 94.6 MW, from PGV (34.6 MW) and HEP (60 MW).

(IV) System Capability for 2016 includes:

- Hawai'i Electric Light units at a total of 181.45 MW net.
- Firm independent power purchase contracts with a combined net total of 94.6 MW, from PGV (34.6 MW) and HEP (60 MW).

(V) System Capability for 2017 includes:

- Hawai'i Electric Light units at a total of 181.45 MW net.

- Firm independent power purchase contracts with a combined net total of 119.5 MW from PGV (38.0 MW), HEP (60 MW), and Hu Honua (21.5 MW).

(VI) System Capability for 2018 includes:

- Hawai'i Electric Light units at a total of 181.45 MW net.

- Firm independent power purchase contracts with a combined net total of 119.5 MW from PGV (38.0 MW), HEP (60 MW), and Hu Honua (21.5 MW).

(VII) Reserve Margin

- Shipman 3 and Shipman 4 have been placed in an inactive status (dry layup). These units were retired as of December 31, 2015 and their capacities (a combined 14.4 MW net) removed from the reserve margin calculation.