

HELCO  
2000-2004

ADEQUACY OF SUPPLY REPORTS  
(SPECIAL REPORTS - PERMANENT)

BA Gen file

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January 30, 2004

Warren H. W. Lee, P.E.  
President

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

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PUBLIC UTILITIES  
COMMISSION

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 2003 total system capability was 255,100 kW net (259,500 kW gross) and included firm capacity power purchases of 27,000 kW from Puna Geothermal Venture ("PGV")<sup>1</sup>, 22,000 kW from Hilo Coast Power Company ("HCPC"), and 60,000 kW from Hamakua Energy Partners, L.P. ("HEP"). Four 1,000 kW dispersed diesel generators (D24-27), which were installed in 1997 as part of HELCO's contingency plan, are now included as firm capacity since they are expected to remain in service until they are no longer needed to maintain reliability. HELCO's system peak of 186,700 kW net (190,900 kW gross) occurred on December 30, 2003, at approximately 6:33 p.m. The 2003 reserve margin was 36.6 % over the system peak.

At the time of the system peak, HELCO had in place 27 load management contracts totaling 6,600 kW under Rider M and Schedule U, which reduced the evening peak by approximately 6,000 kW. In addition, HELCO had residential and commercial & industrial demand side management ("DSM") programs in place, which reduced the system peak by an estimated 5,300 net kW (net of free riders). Without the DSM and off-peak rider agreements, the system peak would have been approximately 198,000 kW net, with a 28.9% reserve margin.

<sup>1</sup> PGV's normal rating is 30,000 kW. In 2003, its normal top load rating averaged 21,000 kW. PGV has been working to restore its capacity and has been able to steadily increase its output to 27,000 kW by the end of 2003. PGV anticipates that it will be fully restored to 30,000 kW by late 2004 with the increase of steam supply from existing wells.

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On October 10, 2003, HELCO (along with HECO and MECO) filed a PUC Application for approval of a proposed utility-owned Combined Heat and Power ("CHP") program in Docket No. 03-0366. Implementation of a CHP program is scheduled to begin in 2004, if authorized by the Commission.<sup>2</sup> This program involves the installation of small distributed generating ("DG") units on selected customer sites. The waste heat from the DG units would be used for the customers' heating and/or cooling purposes. As indicated in the PUC application, HELCO developed a forecast of utility CHP systems for the Big Island (dated August 20, 2003). These estimated impacts of the proposed CHP Program on future system capability are indicated in Attachment 1.

CHP systems can also be owned and operated by third parties (non-utility entities). HELCO developed forecasts for third party CHP systems with and without the utility CHP program (dated August 20, 2003). Both utility and third party CHP systems have the potential to defer the installation of traditional centralized generation. The rate of installation of CHP systems is estimated to be significantly greater with the utility CHP program.<sup>3</sup>

Attachment 1 shows the expected reserve margin over the next three years, based on HELCO's Sales and Peak Forecast dated May 13, 2003, and on HELCO's latest estimate of forecasted DSM impacts. Attachment 2 details the gross and net ratings of HELCO units and IPP units.

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<sup>2</sup> The utilities requested approval of each of their proposed CHP Programs and related tariff provisions (Schedule CHP, Customer-Sited Utility-Owned Cogeneration Service). Under the CHP Program and Schedule CHP, the utilities propose to offer CHP systems to eligible utility customers on the islands of Oahu, Maui, and Hawaii as a regulated utility service. The utilities also indicated that they would request approval on a contract-by-contract basis for CHP system projects that fall outside the scope of the proposed program. On October 21, 2003, the Commission issued Order No. 20582 in Docket No. 03-0371, which initiated a proceeding to investigate DG in Hawaii. The Commission anticipated that other matters related to the DG generic proceeding may be considered on a "case-by-case basis". In their Reply, filed December 26, 2003, to the Consumer Advocate's Statement of Position in the CHP docket, the utilities indicated that, as soon as is practicable after the parties and participants are set in the CHP Program docket, or in the Generic DG Docket, if the two dockets are consolidated, the utilities will file an appropriate motion requesting that the CHP program be allowed to go into effect on an interim basis.

<sup>3</sup> For purposes of this report, utility-owned CHP systems are included in the System Capability numbers (based on the net equivalent capacity of the CHP system, taking into account the electrical capacity supplied to a customer, the reduction of the customer's electrical load through waste heat application for the system, and a reduction in line losses). The load reduction impacts of CHP systems and/or DG owned by third parties are reflected in the System Peak numbers. Since there are expected to be more CHP systems installed with a utility CHP program, the Reserve Margins (System Capability less System Peak divided by System Peak) are greater with the utility CHP program, although the System Peaks appear to be higher because there are estimated to be somewhat fewer third party CHP systems/DG installed with a utility CHP program.



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

*The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.<sup>4</sup>*

HELCO's generation capacity for the Big Island for the next three years is sufficiently large to meet all reasonably expected demands for service and provide reasonable reserves for emergencies.

Very truly yours,



Attachments

cc: Division of Consumer Advocacy

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<sup>4</sup> HELCO will be evaluating whether and to what extent reserve margins higher than those produced by application of the capacity planning criteria should be targeted based on factors (such as unit availabilities) not explicitly considered by the criteria. HELCO plans to perform the analysis in 2004.



**Table 1  
HELCO Adequacy of Supply**

With Utility CHP (Includes 3 <sup>rd</sup> Party CHP) <sup>(i)</sup>						
		Without Future DSM (Includes Acquired DSM) <sup>(iii)</sup>			With Future DSM (Includes Acquired DSM) <sup>(iv)</sup>	
Year	System Capability (net kW) [A]	Notes	System Peak (net kW) [B] <sup>(v)</sup>	Reserve Margin (%) [[A-B]/B] <sup>(x)</sup>	System Peak (net kW) [C] <sup>(v)</sup>	Reserve Margin (%) [[A-C]/C] <sup>(x)</sup>
<i>Revised</i> 2003	255,100	<sup>(vi)</sup>	186,700	36.6%	N/A	N/A
<i>Future</i> 2004	269,000	<sup>(vii)</sup>	188,600	42.6%	187,700	43.3%
2005	270,900	<sup>(viii)</sup>	193,500	40.0%	192,100	41.0%
2006	273,100	<sup>(ix)</sup>	198,500	37.6%	196,600	38.9%

Without Utility CHP (Includes 3 <sup>rd</sup> Party CHP) <sup>(i)</sup>						
		Without Future DSM (Includes Acquired DSM) <sup>(iii)</sup>			With Future DSM (Includes Acquired DSM) <sup>(iv)</sup>	
Year	System Capability (net kW) [A]	Notes	System Peak (net kW) [B] <sup>(v)</sup>	Reserve Margin (%) [[A-B]/B] <sup>(x)</sup>	System Peak (net kW) [C] <sup>(v)</sup>	Reserve Margin (%) [[A-C]/C] <sup>(x)</sup>
<i>Revised</i> 2003	255,100	<sup>(vi)</sup>	186,700	36.6%	N/A	N/A
<i>Future</i> 2004	267,700	<sup>(vii)</sup>	187,800	42.5%	186,900	43.2%
2005	267,700	<sup>(viii)</sup>	191,900	39.5%	190,500	40.5%
2006	267,700	<sup>(ix)</sup>	196,200	36.4%	194,300	37.8%

Notes:

- (I) With Utility CHP:
- System capabilities include forecasted utility CHP impacts.<sup>1</sup> Forecasted system peaks include third party CHP impacts (with utility CHP program).

<sup>1</sup> Utility CHP impacts are from a CHP forecast dated August 20, 2003. These impacts are at system level based on a T&D loss factor of 8.68%. For capacity planning analysis, an availability factor is also included to account for periods when the utility CHP is unavailable due to forced outage and maintenance.

- (II) Without Utility CHP
- System capabilities do not include forecasted utility CHP system level impacts. Forecasted system peaks include third party CHP impacts (without utility CHP program).
- (III) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):
- Implementation of full-scale DSM programs began in the first quarter of 1996 following Commission approval of the programs.
  - The forecasted system peak values for the years 2004-2006 include the actual peak reduction benefits acquired in 1996-2002 and the estimated peak reduction benefits acquired in 2003, as well as the benefits of the Rider M and Schedule U contracts.
- (IV) System Peaks (With Future Peak Reduction Benefits of DSM Programs):
- The forecasted system peaks for 2004-2006 include the peak reduction benefits of the DSM programs (acquired and future) and the Rider M and Schedule U contracts.
- (V) The 2004-2006 annual forecasted system peaks are based on HELCO's 2003-2008 Sales and Peak Forecast, dated May 13, 2003.
- (VI) System Capability for 2003 includes:
- HELCO units at a total of 146,100 kW net (150,500 kW gross).
  - Firm power purchase contracts with a combined net total of 109,000 kW from PGV (27,000 kW),<sup>2</sup> HCPC (22,000 kW) and HEP (60,000 kW).
  - System capability is taken at the time of the actual system peak in December 2003.
- (VII) System Capability for 2004 includes:
- HELCO units at a total of 177,700 kW net (182,000 kW gross) without utility CHP and 179,000 kW net (183,400 kW gross) with utility CHP. This includes the anticipated installation of Keahole CT-4 and CT-5 (39,800 kW net) in 2004. With the installation of CT-4 and CT-5, Keahole D18- D20 (8,250 kW net reserve rating) will be retired. The commercial operation of CT-4 and CT-5 will help to

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<sup>2</sup> PGV generally exported to HELCO 27,000 kW at top load since late 2003. PGV plans to restore its facility to 30,000 kW in late 2004 with the increase of steam supply from existing wells.

alleviate transmission line constraints. Kanoiehua CT-1, D11, D15-17, Waimea D12-14, and Keahole D21-23 (38,250 kW total) will be kept in service until the units are no longer needed to maintain system reliability or to maintain quick start capability.<sup>3</sup> The status of CT-4 and CT-5 is as follows:

In September 2002, construction of Keahole CT-4 and CT-5 was suspended as a result of a Circuit Court Order, which reversed the March 25, 2002 BLNR decision to allow construction to proceed through December 31, 2003. The installation of CT-4 and CT-5 was 85% completed when construction stopped. HELCO appealed the ruling to the Hawaii Supreme Court and also pursued other options that might allow HELCO to complete the installation of CT-4 and CT-5 (including pursuing settlement through court-ordered mediation and seeking land use reclassification of the Keahole site from the Hawaii State Land Use Commission). On October 10, 2003, the Board of Land and Natural Resources (BLNR) conditionally granted HELCO's request for a 19-month extension of the previous December 31, 2003 construction deadline. On November 6, 2003, HELCO reached a settlement agreement with the Keahole Defense Coalition, the State Department of Hawaiian Home Lands, the State Department of Land and Natural Resources, the State Department of Health, Peggy Ratliff, and Mahi Cooper. On November 12, 2003, the Third Circuit Court issued a ruling to vacate the November 7, 2002 Final Judgment, which permitted HELCO to resume construction on CT-4 and CT-5 on November 17, 2003. The conditions of the Settlement require HELCO to undertake a number of actions to mitigate the impact of the power plant in terms of air and noise pollution, and potable water and aesthetic concerns. These mitigation measures are subject to government permits and approvals. It is anticipated that CT-4 and CT-5 will be on-line in the second quarter of 2004 and be fully operational by late 2004.

- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW). It is assumed for purposes of this adequacy of supply analysis that the HCPC Second Amended and Restated PPA, as amended by Amendment No. 1, will be terminated as of December 31, 2004 (with

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<sup>3</sup> The diesel units have fast-starting capability and can be on line within 90 seconds from when they are started. The fast-start diesel units are used to balance generation and load during post-contingency situations such as a generating unit trip or a transmission line outage.

In addition, HELCO is expecting to add a substantial amount of wind generation to its system. The fast-start diesel units provide flexibility in adjusting the amount of firm capacity and regulating capacity HELCO has to have on line to match system load and maintain system frequency and voltage, which can fluctuate instantaneously depending on the amount and intermittent nature of the as-available energy being provided to the system.

early shutdown on November 30, 2004). If notice of termination is provided by May 30, 2004, HCPC has the right not to use its planned September overhaul and to shut down as of midnight, November 30, 2004 as permitted by the agreement. Any decision to terminate would depend on the facts and circumstances at the time.

- System capability is taken at the time of the forecasted system peak in December 2004.

(VIII) System Capability for 2005 includes:

- HELCO units at a total of 177,700 kW net (182,000 kW gross) without utility CHP and 180,900 kW net (185,300 kW gross) with utility CHP.
- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW).
- System capability is taken at the time of the forecasted system peak in December 2005.

(IX) System Capability for 2006 includes:

- HELCO units at a total of 177,700 kW net (182,000 kW gross) without utility CHP and 183,100 (187,500 kW gross) with utility CHP.
- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW).
- System capability is taken at the time of the forecasted system peak in December 2006.

(X) Reserve Margin

- The reserve margins shown for 2004-2006 assume that HEP, PGV, and HCPC (when included) are at full ratings.



**HELCO Adequacy of Supply  
 2003 Unit Ratings (Firm Capacity at Actual System Peak in December 2003)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 3 (I)	7.50	7.50	7.10	7.10
Shipman 4 (I)	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
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 D18	2.75	2.50	2.75	2.50
Keahole D19	2.75	2.50	2.75	2.50
Keahole D20	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	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	0.00	0.00	0.00	0.00
Keahole CT-5	0.00	0.00	0.00	0.00
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
<b>HELCO Total</b>	<b>150.50</b>	<b>147.50</b>	<b>146.10</b>	<b>143.10</b>
HCPC	22.00	22.00	22.00	22.00
PGV	27.00 (II)	27.00 (II)	27.00 (II)	27.00 (II)
HEP	60.00	60.00	60.00	60.00
<b>IPP Total</b>	<b>109.00</b>	<b>109.00</b>	<b>109.00</b>	<b>109.00</b>
<b>System Total</b>	<b>259.50</b>	<b>256.50</b>	<b>255.10</b>	<b>252.10</b>

Notes:

- (I) HELCO is temporarily restricting the outputs of Shipman 3 and 4 to 6.8 MW and 6.7 MW, respectively.
- (II) PGV has been exporting 27 MW since late 2003. They expect to be fully restored to 30 MW by late 2004 with the increase of steam supply from existing wells.

**HELCO Adequacy of Supply**  
**2004 Unit Ratings (Firm Capacity at Forecasted System Peak in December 2004)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 3 (I)	7.50	7.50	7.10	7.10
Shipman 4 (I)	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
Kanoelohua 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
Kanoelohua D15	2.75	2.50	2.75	2.50
Kanoelohua D16	2.75	2.50	2.75	2.50
Kanoelohua D17	2.75	2.50	2.75	2.50
Keahole D18	0.00 (iii)	0.00 (iii)	0.00 (iii)	0.00 (iii)
Keahole D19	0.00 (iii)	0.00 (iii)	0.00 (iii)	0.00 (iii)
Keahole D20	0.00 (iii)	0.00 (iii)	0.00 (iii)	0.00 (iii)
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
Kanoelohua CT1	11.50	11.50	11.50	11.50
Keahole CT2	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	19.90 (iii)	19.90 (iii)	19.90 (iii)	19.90 (iii)
Keahole CT-5	19.90 (iii)	19.90 (iii)	19.90 (iii)	19.90 (iii)
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
Utility CHP	1.31 (iii)	1.31 (iii)	1.31 (iii)	1.31 (iii)
HELCO Total w/o utility CHP	182.05	179.80	177.65	175.40
HELCO Total w/ utility CHP	183.36	181.11	178.96	176.71
HCPC	0.00 (iv)	0.00 (iv)	0.00 (iv)	0.00 (iv)
PGV	30.00 (v)	30.00 (v)	30.00 (v)	30.00 (v)
HEP	60.00	60.00	60.00	60.00
IPP Total	90.00	90.00	90.00	90.00
System Total w/o utility CHP	272.05	269.80	267.65	265.40
System Total w/ utility CHP	273.36	271.11	268.96	266.71

Notes:

- (I) HELCO is temporarily restricting the outputs of Shipman 3 and 4 to 6.8 MW and 6.7 MW, respectively.
- (II) Keahole CT-4 and CT-5 are installed in 2004. Keahole D18-20 are retired in 2004.
- (III) Forecasted aggregate impact of utility CHP program (at system level, T&D loss factor of 8.68%).
- (IV) HCPC contract is terminated on December 31, 2004 (early shutdown occurs on November 30, 2004).
- (V) PGV expects to be restored to 30 MW by late 2004 with the increase of steam supply from existing wells.

**HELCO Adequacy of Supply**  
**2005 Unit Ratings (Firm Capacity at Forecasted System Peak in December 2005)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 3	7.50	7.50	7.10	7.10
Shipman 4	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
Kanoelchua 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
Kanoelchua D15	2.75	2.50	2.75	2.50
Kanoelchua D16	2.75	2.50	2.75	2.50
Kanoelchua D17	2.75	2.50	2.75	2.50
Keahole D18	0.00	0.00	0.00	0.00
Keahole D19	0.00	0.00	0.00	0.00
Keahole D20	0.00	0.00	0.00	0.00
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
Kanoelchua CT1	11.50	11.50	11.50	11.50
Keahole CT2	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	19.90	19.90	19.90	19.90
Keahole CT-5	19.90	19.90	19.90	19.90
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
Utility CHP	3.29 <sup>(1)</sup>	3.29 <sup>(1)</sup>	3.29 <sup>(1)</sup>	3.29 <sup>(1)</sup>
HELCO Total w/o utility CHP	182.05	179.80	177.65	175.40
HELCO Total w/ utility CHP	185.34	183.09	180.94	178.69
HCPC	0.00	0.00	0.00	0.00
PGV	30.00	30.00	30.00	30.00
HEP	60.00	60.00	60.00	60.00
IPP Total	90.00	90.00	90.00	90.00
System Total w/o utility CHP	272.05	269.80	267.65	265.40
System Total w/ utility CHP	275.34	273.09	270.94	268.69

Notes:

(1) Forecasted aggregate impact of utility CHP program (at system level, T&D loss factor of 8.68%).

**HELCO Adequacy of Supply  
2006 Unit Ratings (Firm Capacity at Forecasted System Peak in December 2006)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 3	7.50	7.50	7.10	7.10
Shipman 4	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
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 D18	0.00	0.00	0.00	0.00
Keahole D19	0.00	0.00	0.00	0.00
Keahole D20	0.00	0.00	0.00	0.00
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	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	19.90	19.90	19.90	19.90
Keahole CT-5	19.90	19.90	19.90	19.90
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
Utility CHP	5.48 <sup>(1)</sup>	5.48 <sup>(1)</sup>	5.48 <sup>(1)</sup>	5.48 <sup>(1)</sup>
HELCO Total w/o utility CHP	182.05	179.80	177.65	175.40
HELCO Total w/ utility CHP	187.53	185.28	183.13	180.88
HCPC	0.00	0.00	0.00	0.00
PGV	30.00	30.00	30.00	30.00
HEP	60.00	60.00	60.00	60.00
IPP Total	90.00	90.00	90.00	90.00
System Total w/o utility CHP	272.05	269.80	267.65	265.40
System Total w/ utility CHP	277.53	275.28	273.13	270.88

Notes:

(1) Forecasted aggregate impacts of utility CHP program (at system level, T&D loss factor of 8.68%).

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Warren H. W. Lee, P.E.  
President

January 31, 2003

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The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 2002 total system capability was 233,700 kW net (238,100 kW gross) and included firm capacity power purchases of 5,600 kW from Puna Geothermal Venture ("PGV")<sup>1</sup>, 22,000 kW from Hilo Coast Power Company ("HCPC"), and 60,000 kW from Hamakua Energy Partners, L.P. ("HEP")<sup>2</sup>. Four 1,000 kW dispersed diesel generators (D24-27), which were installed in 1997 as part of HELCO's contingency plan, are now included as firm capacity since they are expected to remain in service until they are no longer needed to maintain reliability. HELCO's system peak of 177,900 kW net (182,200 kW gross) occurred on December 30, 2002, at approximately 6:30 p.m. The 2002 reserve margin was 31.4% over the system peak<sup>3</sup>.

At the time of the system peak, HELCO had in place 27 load management contracts totaling 6,600 kW under Rider M and Schedule U, which reduced the evening peak by approximately 6,000 kW. In addition, HELCO had residential and commercial & industrial demand side management ("DSM") programs in place, which reduced the system peak by an

<sup>1</sup> PGV's normal rating is 30,000 kW. Since April 2002, its normal top load rating was reduced to an average of 5,600 kW due to blockage of a source well and decreasing steam quality from another source well. The average rating for all of 2002 was 8,500 kW. PGV is in the process of drilling additional source wells and a re-injection well to restore its output to 30,000 KW. PGV anticipates that it will be fully restored to 30 MW by mid-2003.

<sup>2</sup> HEP's normal rating is 60,000 kW. At the time of the December 30, 2002 system peak, HEP was temporarily derated to 57,000 kW due to vibration on the steam turbine generator. An outage is being scheduled for March 2003 to address the vibration problem.

<sup>3</sup> 2002 reserve margin is calculated using the formula:  $\frac{2002TotalCapacity - 2002Peak}{2002Peak}$

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estimated 4,900 net kW (net of free riders). These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been approximately 188,800 kW net, with a 23.8% reserve margin. HELCO's expected reserve margins for the three-year period covered by this report (2003-2005) are adequate based on the assumptions listed below, as shown in Attachment 1. HELCO will have sufficient capacity available on its system to cover the projected annual system peaks with scheduled maintenance and loss of the largest unit for the three-year period based on the assumptions listed below.

HELCO's adequacy of supply projections for the years 2003, 2004, and 2005 are based on the following assumptions:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor, dated March 5, 2002.
- The Net Reserve Ratings for HELCO units and firm capacity power purchases listed in Attachment 2.
- Continuation of the HCPC Second Amended and Restated PPA, as amended by Amendment No. 1<sup>4</sup>, under which HCPC provides HELCO with 22,000 kW of firm capacity to December 31, 2004<sup>5</sup>.
- PGV continues to operate under its existing PPA, which provides for PGV to supply 30,000 kW of firm capacity to HELCO.<sup>6</sup>
- Installations of Keahole units CT-4 and CT-5 are projected to occur during mid-2004. For the purpose of conducting resource planning analysis, the installation

<sup>4</sup> The terms of the Second Amended and Restated PPA runs from January 1, 2000 through December 31, 2004 (subject to HELCO's right of early termination). After 2004, the contract continues on a year-to-year basis, subject to termination by either HELCO or HCPC upon written termination notice issued by May 30 of the termination year. In the year that termination notice is given, HCPC would have the right to not use its September overhaul in the year notice is given, and would be permitted to shut down as of midnight, November 30, of such year. Any decision to give notice of termination would be based on the facts and circumstances at the time. For the purposes of this analysis it is assumed that the HCPC Second Amended and Restated PPA will be terminated on December 31, 2004 with early shutdown on November 30, 2004.

<sup>5</sup> HCPC will provide HELCO with the firm capacity 5 days per week during a 14-hour daily on-peak period. HCPC must use its "reasonable best efforts" to provide HELCO with energy outside of the on-peak period, upon HELCO's request.

<sup>6</sup> PGV has been providing an average of 5,600 kW since April 2002 due to source well problems. PGV is working on a plan to restore its facility to its full rating of 30,000 kW by June 2003.



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dates for CT-4 and CT-5 are assumed to be June 2004<sup>7</sup>, as explained in Attachment 1.

- Shipman 1 and Waimea D8-10 were retired in February 2002 and are not included as firm capacity from 2002.
- Dispersed diesels D24-27 are now included as firm capacity. They were installed in 1997 as mitigation measures. They are now expected to remain in service until they are no longer needed to maintain reliability.
- The following capacity planning criteria was used to determine the need for additional generation:

*The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied<sup>8</sup>.*

Very truly yours,

*Damen Bowlee*

Attachments

cc: Division of Consumer Advocacy

<sup>7</sup> The construction of Keahole CT-4 and CT-5 has been suspended due to a September 2002 Circuit Court ruling. HELCO has filed appeals with the Hawaii State Supreme Court in order to continue construction. Because the matter is still in litigation, the service dates for CT-4 and CT-5 are subject to change.

<sup>8</sup> HELCO will be evaluating whether and to what extent reserve margins higher than those produced by application of the capacity planning criteria should be targeted based on factors (such as unit availabilities) not explicitly considered by the criteria.





**Table 1  
 Adequacy of Supply**

Year	System Capability (net kW) [A]	Notes	Without Future DSM (Includes Acquired DSM) <sup>(1)</sup>		With Future DSM (Includes Acquired DSM) <sup>(2)</sup>	
			System Peak (net kW) [B] <sup>(3)</sup>	Reserve Margin (%) $[[A-B]/B]$ <sup>(8)</sup>	System Peak (net kW) [B] <sup>(3)</sup>	Reserve Margin (%) $[[A-B]/B]$ <sup>(8)</sup>
<i>Recorded</i> 2002	233,700	(4)	177,900	31.4%	N/A	N/A
<i>Future</i> 2003	258,100	(5)	180,400	43.1%	179,400	43.9%
2004	267,700	(6)	184,200	45.3%	182,700	46.5%
2005	267,700	(7)	188,100	42.3%	186,100	43.8%

Notes:

- (1) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):  
 Implementation of full-scale DSM programs began in the first quarter of 1996 following Commission approval of the programs. The forecasted system peak values for the years 2003-2005 include the actual peak reduction benefits acquired in 1996-2001 and the estimated peak reduction benefits acquired in 2002, as well as the benefits of the Rider M and Schedule U contracts.
- (2) System Peaks (With Future Peak Reduction Benefits of DSM Programs):  
 The forecasted system peaks for 2003-2005 include the peak reduction benefits of the DSM programs (acquired and future) and the Rider M and Schedule U contracts.
- (3) The 2003-2005 annual forecasted system peaks are based on HELCO's 2002-2007 Sales and Peak Forecast, dated March 5, 2002.
- (4) System Capability for 2002 includes:
- HELCO units at a total of 146,100 kW net (150,500 kW gross) with the four 1,000 kW dispersed generators. Shipman 1 and Waimea D8-10 were retired in February 2002.
  - Firm power purchase contracts with a combined net total of 87,600 kW for 2002 from PGV (5,600 kW), <sup>1</sup> HCPC (22,000 kW) and HEP (60,000 kW).

<sup>1</sup> PGV generally exported to HELCO 5,600 kW at top load since April 2002 due to well blockage. PGV plans to restore its facility to 30,000 kW in mid-2003.

(5) System Capability for 2003 includes:

- HELCO units at a total of 146,100 kW net with the four 1,000 kW dispersed generators.
- Firm power purchase contracts with a combined net total of 112,000 kW from PGV (30,000 kW), HCPC (22,000 kW) and HEP (60,000 kW).

(6) System Capability for 2004 includes:

- HELCO units at a total of 177,700 kW net with the four 1,000 kW dispersed generators. This includes the installation of Keahole CT-4 and CT-5 (39,800 kW net) in June 2004. With the installation of CT-4 and CT-5, Keahole D18- D20 (8,250 kW net reserve rating) will be retired. Kanoelehua CT-1, D11, D15-17, Waimea D12-14, and Keahole D21-23 (38,250 kW total) will be kept in service until the units are no longer needed to maintain system reliability or to maintain quick start capability.<sup>2</sup> The status of CT-4 and CT-5 is as follows:

On March 25, 2002, the Board of Land and Natural Resources ("BLNR") granted HELCO's request for an extension to complete construction under its land use entitlement. In April 2002, after the Circuit Court granted HELCO's motion to lift a stay on construction, HELCO resumed construction on CT-4 and CT-5. However, in September 2002, construction was suspended as a result of a Circuit Court Order, which reversed the March 25, 2002 BLNR decision to allow construction to proceed through December 31, 2003. The installation of CT-4 and CT-5 was 85% completed when construction stopped. HELCO has filed an Appeal and Motion for Stay of this judgment with the Hawaii State Supreme Court. HELCO has also appealed a previous ruling by the Circuit Court from November 2000, which first determined that HELCO's land use entitlement expired in April 1999. HELCO's other permits (i.e., air permit, building permits, etc.) for construction of CT-4 and CT-5 remain active and valid at this time. At this time it is estimated that CT-4 and CT-5 could be in service by mid-2004. For the purposes of this analysis, it is assumed that their service dates are June 2004. Since this matter is still in litigation, the service dates are subject to change.

<sup>2</sup> The diesel units have fast-starting capability and can be on line within 90 seconds from when they are started. The fast-start diesel units are used to balance generation and load during post-contingency situations such as a generating unit trip or a transmission line outage, and have been helpful given the operational issues with the HEP facility.

In addition, HELCO is expecting to add a substantial amount of wind generation to its system. The fast-start diesel units provide flexibility in adjusting the amount of firm capacity and regulating capacity HELCO has to have on line to match system load and maintain system frequency and voltage, which can fluctuate instantaneously depending on the amount and intermittent nature of the as-available energy being provided to the system. HELCO will review whether and to what extent this flexibility will still be needed after the new Keahole combustion turbines are commercially operational and new wind generation is added.

- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW). It is assumed for purposes of this adequacy of supply analysis that the HCPC Second Amended and Restated PPA will be terminated as of December 31, 2004 (with early shutdown on November 30, 2004). If notice of termination is provided by May 30, 2004, HCPC has the right not to use its planned September overhaul and to shut down as of midnight, November 30, 2004 as permitted by the agreement. Any decision to terminate would depend on the facts and circumstances at the time.
- The reserve margins of 46.5% and 45.3% (with and without future DSM, respectively) apply only in December 2004, after Keahole CT-4 and CT-5 are installed in June 2004, Keahole D18-20 are retired, and after HCPC is shutdown at the end of November 2004. Prior to the installation of CT-4 and CT-5, the reserve margins will be 41.3% and 40.1% (with and without future DSM, respectively)<sup>3</sup>. If CT-4 and CT-5 have not been installed, Keahole D18-20 will not be retired and it is assumed that the HCPC Second Amended and Restated PPA will not be terminated. Under the circumstances, the reserve margins will be 41.3% and 40.1% (with and without DSM, respectively).

(7) System Capability for 2005 includes:

- HELCO units at a total of 177,700 kW net with four 1,000 kW dispersed generators. HELCO plans to keep Kanoelehua CT-1, D11, D15-17, Waimea D12-14, and Keahole D21-23, totaling 38,250 kW, in service until the units are no longer needed to maintain system reliability or to maintain quick-start capability.
- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW).
- The reserve margins of 43.8% and 42.3% (with and without DSM, respectively) assume that, in 2004, CT-4 and CT-5 are installed, Keahole D18-20 are retired, and the HCPC Second Amended and Restated PPA is terminated. If CT-4 and CT-5 have not been installed, Keahole D18-20 will not be retired and it is assumed that the HCPC Second Amended and Restated PPA will not be terminated. Under the circumstances, the reserve margins will be 38.7% and 37.2% (with and without DSM, respectively).

(8) Reserve Margin

The reserve margins shown for 2003-2005 assume that HEP, PGV, and HCPC (when included) are at full ratings. These purchased power units have been derated in recent months but the deratings are not expected to affect HELCO's ability to serve load.

<sup>3</sup> The reserve margins were calculated based on the 2004 forecasted peak and 2004 capacity prior to installing Keahole CT-4 and CT-5 and retiring Keahole D18-20.

**HELCO Adequacy of Supply  
2002 Unit Ratings (Firm Capacity)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (1)
Shipman 3	7.50 (2)	7.50 (2)	7.10 (2)	7.10 (2)
Shipman 4	7.70 (2)	7.70 (2)	7.30 (2)	7.30 (2)
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
Waimea D8	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (1)
Waimea D9	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (1)
Waimea D10	0.00 (1)	0.00 (1)	0.00 (1)	0.00 (1)
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 D18	2.75	2.50	2.75	2.50
Keahole D19	2.75	2.50	2.75	2.50
Keahole D20	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	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	0.00 (3)	0.00 (3)	0.00 (3)	0.00 (3)
Keahole CT-5	0.00 (3)	0.00 (3)	0.00 (3)	0.00 (3)
Panaewa D24	1.00 (4)	1.00 (4)	1.00 (4)	1.00 (4)
Ouli D25	1.00 (4)	1.00 (4)	1.00 (4)	1.00 (4)
Punaluu D26	1.00 (4)	1.00 (4)	1.00 (4)	1.00 (4)
Kapua D27	1.00 (4)	1.00 (4)	1.00 (4)	1.00 (4)
<b>HELCO Total</b>	<b>150.50</b>	<b>147.50</b>	<b>146.10</b>	<b>143.10</b>
HCPC	22.00	22.00	22.00	22.00
PGV	5.60 (5)	5.60 (5)	5.60 (5)	5.60 (5)
HEP	60.00 (6)	60.00 (6)	60.00 (6)	60.00 (6)
<b>IPP Total</b>	<b>87.60</b>	<b>87.60</b>	<b>87.60</b>	<b>87.60</b>
<b>System Total</b>	<b>238.10</b>	<b>235.10</b>	<b>233.70</b>	<b>230.70</b>

Notes:

- (1) Shipman 1 and Waimea D8-10 were retired in February 2002.
- (2) HELCO is temporarily restricting the outputs of Shipman 3 and 4 to 6.7 MW and 6.8 MW, respectively.
- (3) Keahole CT-4 and CT-5 were not installed in 2002.
- (4) Panaewa D24, Ouli D25, Punaluu D26, Kapua D27 are now counted as firm capacity since they have been in operation since 1997, and are not expected to be retired in the near future.
- (5) PGV has been exporting an average of 5.6 MW since April 2002 due to well problems.

- (6) HEP's normal rating is 60 MW. At the time of the December 30, 2002 system peak, HEP was temporarily derated to 57 MW due to vibration on the steam turbine generator. An outage is being scheduled for March 2003 to address the vibration problem.

**HELCO Adequacy of Supply  
 2003 Unit Ratings (Firm Capacity)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00	0.00	0.00	0.00
Shipman 3	7.50 (1)	7.50 (1)	7.10 (1)	7.10 (1)
Shipman 4	7.70 (1)	7.70 (1)	7.30 (1)	7.30 (1)
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
Waimea D8	0.00	0.00	0.00	0.00
Waimea D9	0.00	0.00	0.00	0.00
Waimea D10	0.00	0.00	0.00	0.00
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 D18	2.75 (2)	2.50 (2)	2.75 (2)	2.50 (2)
Keahole D19	2.75 (2)	2.50 (2)	2.75 (2)	2.50 (2)
Keahole D20	2.75 (2)	2.50 (2)	2.75 (2)	2.50 (2)
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	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	0.00 (2)	0.00 (2)	0.00 (2)	0.00 (2)
Keahole CT-5	0.00 (2)	0.00 (2)	0.00 (2)	0.00 (2)
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
<b>HELCO Total</b>	<b>150.50</b>	<b>147.50</b>	<b>146.10</b>	<b>143.10</b>
HCPC	22.00	22.00	22.00	22.00
PGV	30.00 (3)	30.00 (3)	30.00 (3)	30.00 (3)
HEP	60.00 (4)	60.00 (4)	60.00 (4)	60.00 (4)
<b>IPP Total</b>	<b>112.00</b>	<b>112.00</b>	<b>112.00</b>	<b>112.00</b>
<b>System Total</b>	<b>262.50</b>	<b>259.50</b>	<b>258.10</b>	<b>255.10</b>

Notes:

- (1) HELCO is temporarily restricting the outputs of Shipman 3 and 4 to 6.7 MW and 6.8 MW, respectively.
- (2) Keahole CT-4 and CT-5 are not installed in 2003. Keahole D18-20 are not retired in 2003.
- (3) PGV expects to be restored to 30 MW by June 2003.
- (4) HEP was temporarily derated to 57 MW due to vibration on its steam turbine generator. A steam turbine outage to address the problem is scheduled for March 2003.

**HELCO Adequacy of Supply  
2004 Unit Ratings (Firm Capacity)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00	0.00	0.00	0.00
Shipman 3	7.50 (1)	7.50 (1)	7.10 (1)	7.10 (1)
Shipman 4	7.70 (1)	7.70 (1)	7.30 (1)	7.30 (1)
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
Waimea D8	0.00	0.00	0.00	0.00
Waimea D9	0.00	0.00	0.00	0.00
Waimea D10	0.00	0.00	0.00	0.00
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 D18	0.00 (2)	0.00 (2)	0.00 (2)	0.00 (2)
Keahole D19	0.00 (2)	0.00 (2)	0.00 (2)	0.00 (2)
Keahole D20	0.00 (2)	0.00 (2)	0.00 (2)	0.00 (2)
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	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	19.90 (2)	19.90 (2)	19.90 (2)	19.90 (2)
Keahole CT-5	19.90 (2)	19.90 (2)	19.90 (2)	19.90 (2)
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
<b>HELCO Total</b>	<b>182.05</b>	<b>179.80</b>	<b>177.65</b>	<b>175.40</b>
HGPC	0.00 (3)	0.00 (3)	0.00 (3)	0.00 (3)
PGV	30.00	30.00	30.00	30.00
HEP	60.00	60.00	60.00	60.00
<b>IPP Total</b>	<b>90.00</b>	<b>90.00</b>	<b>90.00</b>	<b>90.00</b>
<b>System Total</b>	<b>272.05</b>	<b>269.80</b>	<b>267.65</b>	<b>265.40</b>

Notes:

- (1) HELCO is temporarily restricting the outputs of Shipman 3 and 4 to 6.7 MW and 6.8 MW, respectively.
- (2) Keahole CT-4 and CT-5 are assumed to be installed in mid-2004. D18-20 are to be retired with the installation of CT-4 and CT-5. Since CT-4 and CT-5 are in litigation, the service dates are subject to change.
- (3) HGPC to be terminated on December 31, 2004 (with early shutdown on November 30, 2004) for purposes of this analysis. Any decision to terminate HGPC would depend on the facts and circumstances at the time.

**HELCO Adequacy of Supply  
 2005 Unit Ratings (Firm Capacity)**

Unit	(Gross MW)		(Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00	0.00	0.00	0.00
Shipman 3	7.50 (1)	7.50 (1)	7.10 (1)	7.10 (1)
Shipman 4	7.70 (1)	7.70 (1)	7.30 (1)	7.30 (1)
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Puna	15.50	15.50	14.10	14.10
Waimea D8	0.00	0.00	0.00	0.00
Waimea D9	0.00	0.00	0.00	0.00
Waimea D10	0.00	0.00	0.00	0.00
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 D18	0.00	0.00	0.00	0.00
Keahole D19	0.00	0.00	0.00	0.00
Keahole D20	0.00	0.00	0.00	0.00
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	13.00	13.00	13.00	13.00
Puna CT3	20.80	20.80	20.40	20.40
Keahole CT-4	19.90	19.90	19.90	19.90
Keahole CT-5	19.90	19.90	19.90	19.90
Panaewa D24	1.00	1.00	1.00	1.00
Ouli D25	1.00	1.00	1.00	1.00
Punaluu D26	1.00	1.00	1.00	1.00
Kapua D27	1.00	1.00	1.00	1.00
<b>HELCO Total</b>	<b>182.05</b>	<b>179.80</b>	<b>177.65</b>	<b>175.40</b>
HCPC	0.00	0.00	0.00	0.00
PGV	30.00	30.00	30.00	30.00
HEP	60.00	60.00	60.00	60.00
<b>IPP Total</b>	<b>90.00</b>	<b>90.00</b>	<b>90.00</b>	<b>90.00</b>
<b>System Total</b>	<b>272.05</b>	<b>269.80</b>	<b>267.65</b>	<b>265.40</b>

Notes:  
 (1) HELCO is temporarily restricting the outputs of Shipman 3 and 4 to 6.7 MW and 6.8 MW, respectively.





Warren H. W. Lee, P.E.  
President

February 7, 2002

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

2002 FEB - 7 P 3:41  
PUBLIC UTILITIES  
COMMISSION  
FILED

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 2001 total system capability was 256,700 kW net (261,500 kW gross) and included firm capacity power purchases of 28,000 kW from Puna Geothermal Venture ("PGV")<sup>1</sup>, 22,000 kW from Hilo Coast Power Company ("HCPC"), and 58,500 kW from Hamakua Energy Partners, L.P. ("HEP")<sup>2</sup>. Four MW of dispersed diesels, which were installed in 1997 as part of HELCO's contingency plan, are not included as firm capacity. HELCO's system peak of 174,100 kW net (178,100 kW gross) occurred on December 17, 2001, at approximately 6:32 p.m., and resulted in a reserve margin of 47.4% over the system peak.

At the time of the system peak, HELCO had in place 29 load management contracts totaling 7,400 kW under Rider M and Schedule U, which reduced the evening peak by approximately 6,700 kW. In addition, HELCO had residential and commercial & industrial demand side management ("DSM") programs in place, which reduced the system peak by an estimated 4,400 net kW (net of free riders). These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been approximately 185,200 kW net, with a 38.6% reserve margin. HELCO's expected reserve margins for the three-year period covered by this report (2002-2004) are adequate, as shown in Attachment 1. HELCO will have sufficient capacity available on its system to cover the

<sup>1</sup> PGV's normal rating is 30,000 kW. In 2001, its normal top load rating was reduced to 28,000 kW due to changes in the characteristics of its steam source.

<sup>2</sup> HEP's normal rating is 60,000 kW. At the time of the system peak, its normal top load rating was reduced to 58,500 kW due to problems with its steam turbine generator.

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
February 7, 2002  
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projected annual system peaks with scheduled maintenance and loss of the largest unit for the three-year period.

HELCO's adequacy of supply projections for the years 2002, 2003, and 2004 are based on the following:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor, dated April 10, 2001 and updated November 2001.
- The Net Reserve Ratings for HELCO units and firm capacity power purchases listed in Attachment 2.
- Continuation of the HCPC Second Amended and Restated PPA, as amended by Amendment No. 1<sup>3</sup>, under which HCPC provides HELCO with 22,000 kW of firm capacity.<sup>4</sup>
- HEP Phase 2 was placed in commercial operation on December 31, 2000. After an initial testing and adjustment period, HEP's rating was adjusted to 60,000 kW on June 19, 2001.<sup>5</sup>

<sup>3</sup> The Second Amended and Restated PPA commenced on January 1, 2000 and will terminate on December 31, 2004, unless HELCO chooses to provide written notice of early termination. After 2004, if the PPA is not terminated before then, the contract continues on a year to year basis, subject to termination by either HELCO or HCPC upon written termination notice issued by May 30 of the termination year. HELCO has the right to terminate the Second Amendment and Restated PPA as early as January 1, 2003. (If HELCO terminates the contract as of January 1, 2003, or January 1, 2004, a declining early termination payment will apply.) For termination to occur as of January 1, 2003 or January 1, 2004, written notice of termination would have to be given by May 30, 2002 or May 30, 2003, respectively. In the case of such an early notice of termination, HCPC would have the right to not use its September overhaul in the year notice is given, and would be permitted to shut down as of midnight, November 30, of such year. Any decision to give early notice of termination would be based on the facts and circumstances at the time.

<sup>4</sup> HCPC will provide HELCO with the firm capacity 5 days per week during a 14-hour daily on-peak period. HCPC must use its "reasonable best efforts" to provide HELCO with energy outside of the on-peak period, upon HELCO's request. On January 18, 2002, HCPC notified HELCO of an immediate deration to 18,000 kW due to air permit considerations. HCPC plans to complete work by the end of February to permit operation at 22,000 kW, and it is assumed that HCPC's firm capacity of 22,000 kW is available at the time of the 2002 system peak.

<sup>5</sup> HEP Phase 1, which was a combustion turbine ("CT"), was placed in service on August 12, 2000. Phase 2 of HEP's dual-train combined cycle ("DTCC") facility was placed in service on December 31, 2000. HEP declared a firm capacity level of 59,044 kW after its Phase 2 initial acceptance test at the end of 2000, but HELCO disagreed. HELCO and HEP then reached an agreement on March 16, 2001 on an initial firm capacity of 57,758 kW for the DTCC facility. HEP conducted a subsequent capacity test on June 18, 2001, after it reinstalled its second CT. (The HEP-owned second CT sustained damage during initial testing and was returned to the factory for repairs. A leased CT was temporarily substituted in its place.) HELCO has been paying HEP on the basis of



The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
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- PGV continues to operate under its existing PPA, which provides for PGV to supply 30,000 kW of firm capacity to HELCO.<sup>6</sup>
- Installations of Keahole units CT-4 and CT-5 are projected to occur during the end of 2002. For the purpose of conducting resource planning analysis, the installation dates for CT-4 and CT-5 are assumed to be October 2002 and December 2002, respectively, as explained in Attachment 1.
- Puna CT-3 experienced a major equipment failure on January 7, 2002. Based on an initial assessment of the damage, the gas generator section of the engine will need to be repaired at an out-of-state facility. HELCO has leased a gas generator of identical design and installed it on January 31, 2002. CT-3 will operate using the leased gas generator until the repaired gas generator is on site for reinstallation in early May 2002.
- Shipman 3 and 4 are currently operated on warm standby mode and included as firm capacity in the total system capability.
- Shipman 1 and Waimea D8-10 will be retired in 2002 and are not included as firm capacity from 2002.
- The following capacity planning criteria was used to determine the need for additional generation:

*The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.*

Very truly yours,

*Nanen Kule*

Attachments

cc: Division of Consumer Advocacy

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60,000 kW since June 19, 2001. The HEP DTCC facility generally has not been providing 60,000 kW, and HELCO and HEP are reviewing the facility's firm capacity.

<sup>6</sup> PGV has been providing less than 30,000 kW due to changes in the characteristics of its steam source. PGV is working on a plan to restore its facility to its full rating of 30,000 kW in 2002.



**Table 1  
Adequacy of Supply**

Year	System Capability (net kW) [A]	Notes	Without Future DSM (Includes Acquired DSM) <sup>(1)</sup>		With Future DSM (Includes Acquired DSM) <sup>(2)</sup>	
			System Peak (net kW) [B] <sup>(3)</sup>	Reserve Margin (%) $[[A-B]/B]$ <sup>(8)</sup>	System Peak (net kW) [B] <sup>(3)</sup>	Reserve Margin (%) $[[A-B]/B]$ <sup>(8)</sup>
<i>Recorded</i> 2001	256,700	(4)	174,100	47.4%	N/A	N/A
<i>Future</i> 2002	285,700	(5)	178,100	60.4%	176,200	62.1%
2003	285,700	(6)	181,900	57.1%	179,400	59.3%
2004	263,700	(7)	185,800	41.9%	182,600	44.4%

Notes:

- (1) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):  
Implementation of full-scale DSM programs began in the first quarter of 1996 following Commission approval of the programs. The forecasted system peak values for the years 2002-2004 include the actual peak reduction benefits acquired in 1996-2000 and the estimated impacts acquired in 2001, as well as the benefits of the Rider M and Schedule U contracts.
- (2) System Peaks (With Future Peak Reduction Benefits of DSM Programs):  
The forecasted system peaks for 2002-2004 include the peak reduction benefits of the DSM programs (acquired and future) and the Rider M and Schedule U contracts.
- (3) The 2002-2004 annual forecasted system peaks are based on HELCO's 2001-2006 Sales and Peak Forecast, dated April 10, 2001, and updated in November 2001 with revised sales and peaks.
- (4) System Capability for 2001 includes:
- HELCO units at a total of 148,200 kW net (153,000 kW gross) without the four 1 MW dispersed generators. Shipman 3 and 4 are on warm standby.<sup>1</sup>

<sup>1</sup> Shipman 3 and 4 provided firm capacity that was needed due to multiple outages on the HELCO system in 2001. In general, HELCO currently operates one of the Shipman units on Saturdays and the other unit on Sundays during the evening peak to maintain the units' reliability while on warm standby. Operating the units at least once per week allows the boiler chemicals to circulate through the boilers and exercises other pieces of

- Firm power purchase contracts with a combined net total of 108,500 kW for 2001 from PGV (28,000 kW),<sup>2</sup> HCPC (22,000 kW) and HEP (60,000 kW normal capability, 58,500 kW at the time of the system peak).<sup>3</sup>
- (5) System Capability for 2002 includes:
- HELCO units at a total of 173,650 kW net.<sup>4</sup> This includes the installation of Keahole CT-4 (19,900 kW net) in October 2002 and CT-5 (19,900 kW net) in December 2002. With the installation of CT-4, Keahole D18 and D19 (5,500 kW net reserve rating) will be retired. Keahole D20 (2,750 kW net reserve rating) will be retired with the installation of CT-5. Shipman 1 and Waimea D8-10 are to be retired in 2002. The total retirements equal 14,350 kW net (reserve ratings). The status of CT-4 and CT-5 is as follows:

*HELCO was granted a final Prevention of Significant Deterioration ("PSD")/Covered Source Permit on November 27, 2001 when the Environmental Protection Agency's ("EPA") Environmental Appeals Board ("EAB") denied the review of six petitions received against the permit. (On January 29, 2002, the EAB issued an Order denying a motion for reconsideration filed by the Keahole Defense Coalition.) HELCO is currently awaiting a decision from the Board of Land and Natural Resources ("BLNR") for a request submitted by HELCO on October 20, 2000 for an extension of time to complete construction of its Keahole Generating Station under the amendment to its Conservation District Use Permit ("CDUP"). The BLNR decided that HELCO's request should be raised in a contested case hearing. On November 15, 2001, the BLNR released recommendations from contested case Hearing Officer Chillingworth, who recommended HELCO be granted the time extension to complete construction of Keahole CT-4, CT-5, and ST-7. BLNR heard final arguments from all parties during a special session meeting on January 10, 2002. No date has been set for when the BLNR might vote on the issue. Upon issuance of a favorable ruling by the BLNR, HELCO would file a motion with the Third Circuit Court to remove*

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equipment at the plant, which helps maintain the reliability of the units. Either Shipman 3 or 4 must be off-line in order for Shipman 1 to operate at full rating due to Title V permit restrictions. See Attachment 2 for unit ratings.

- <sup>2</sup> During 2001, PGV generally exported to HELCO between 22,000 kW and 28,000 kW at top load due to changes in the characteristics of its steam source. PGV plans to restore its facility to 30,000 kW in 2002.
- <sup>3</sup> The HEP Phase 2 rating was adjusted to 60,000 kW on June 19, 2001. By the end of 2001, however, HEP was exporting between 56,000 kW and 58,500 kW to HELCO at top load. HEP's 58,500 kW top load capacity is included in the reserve margin calculation. HEP is working to restore the facility's output to 60,000 kW, and HELCO and HEP are reviewing the facility's firm capacity. (HEP was temporarily offline at the time of the December 17, 2001 system peak due to an outage scheduled for the purpose of an internal inspection of the steam turbine and installation of permanent isolation valves on the high pressure steam piping.)
- <sup>4</sup> The Puna CT-3 unit, which is undergoing repair, was included at full capacity (20.4 MW) in 2002 because the unit is expected to be in operation by early May 2002, well before the annual peak, which usually occurs in November or December.

the stay on construction order issued by Judge Ibarra on September 18, 2000. HELCO anticipates CT-4 and CT-5 may be in service in late 2002. For the purposes of conducting resource planning analyses, CT-4 and CT-5 in-service dates of October 2002 and December 2002, respectively, will be assumed.

- Firm power purchase contracts with a combined net total of 112,000 kW from PGV (30,000 kW), HCPC (22,000 kW)<sup>5</sup> and HEP (60,000 kW).
- The reserve margins of 60.4% and 62.1% (without and with future DSM, respectively) apply only in December 2002, after Keahole CT-4 has been installed in October 2002 and CT-5 has been installed in December 2002. Prior to the installation of CT-4 and CT-5, the reserve margins will be less than indicated.
- On January 18, 2002, HCPC notified HELCO of an immediate deration to 18,000 kW due to air permit considerations. HCPC plans to complete work by the end of February to permit operation at 22,000 kW, and it is assumed that HCPC's firm capacity of 22,000 kW is available at the time of the 2002 system peak.

(6) System Capability for 2003 includes:

- HELCO units at a total of 173,650 kW net. Kanoelehua CT-1, D11, D15-17, Waimea D12-14, and Keahole D21-23 (38,250 kW total) will be kept in service until the units are no longer needed to maintain system reliability or to maintain quick start capability.<sup>6</sup>

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<sup>5</sup> Any decision to give early notice of termination of the HCPC Second Amended and Restated PPA would be based on the facts and circumstances at the time. If notice of termination of the agreement was to be provided in 2002, then HCPC would have the right to not use its planned September overhaul in 2002 and to shut down as of midnight, November 30, as permitted by the agreement. In that event, the reserve margin in December 2002 would be reduced to 48.0% without future DSM and 49.6% with future DSM.

<sup>6</sup> The diesel units have fast-starting capability and can be on line within 90 seconds from when they are started. The fast-start diesel units are used to balance generation and load during post-contingency situations such as a generating unit trip or a transmission line outage, and have been helpful given the operational issues with the HEP facility. (Operational issues are not abnormal with the start-up of a new unit. In the case of HEP, the DTCC facility experienced a number of unit trips in its first year of operation and HELCO has worked with HEP to address issues involving start-up times, the transition from single-train to DTCC operations, and the dispatch of the facility using HELCO's Energy Management System.)

In addition, HELCO is expecting to add a substantial amount of wind generation to its system. The fast-start diesel units provide flexibility in adjusting the amount of firm capacity and regulating capacity HELCO has to have on line to match system load and maintain system frequency and voltage, which can fluctuate instantaneously depending on the amount and intermittent nature of the as-available energy being provided to the system. HELCO will review whether and to what extent this flexibility will still be needed after the new Keahole combustion turbines are commercially operational and new wind generation is added.

- Firm power purchase contract with a combined net total of 112,000 kW from HCPC (22,000 kW),<sup>7</sup> PGV (30,000 kW), and HEP (60,000 kW).

(7) System Capability for 2004 includes:

- HELCO units at a total of 173,650 kW net. HELCO plans to keep Kanoelehua CT-1, D11, D15-17, Waimea D12-14, and Keahole D21-23, totaling 38,250 kW, in service until the units are no longer needed to maintain system reliability or to maintain quick-start capability.
- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW). It is assumed for purposes of this adequacy of supply analysis that the HCPC Second Amended and Restated PPA is terminated as of December 31, 2004, although the agreement may be terminated earlier if circumstances permit.<sup>8</sup> HCPC would have the right to not use its planned September overhaul in the year in which the agreement is terminated, and it is assumed that HCPC would shut down as of midnight, November 30, 2004, as permitted by the agreement, and that the HCPC firm capacity (22,000 kW) is not available after such date.

(8) Reserve Margin

The reserve margins shown for 2002-2004 assume that HEP, PGV, and HCPC (when included) are at full ratings. These purchased power units have been derated in recent months but the deratings are not expected to affect HELCO's ability to serve load.

<sup>7</sup> It is assumed that HCPC's firm capacity is available at the time of the 2003 system peak. Any decision to give early notice of termination of the HCPC Second Amended and Restated PPA would be based on the facts and circumstances at the time. If notice of termination of the agreement was to be provided in 2002, then HCPC would not be available in 2003. If notice of termination was to be provided in 2003, then HCPC would have the right to not use its planned September overhaul in such year and to shut down as of midnight, November 30, as permitted by the agreement. In either event, the reserve margin in December 2003 would be reduced to 44.9% without future DSM and 47.0% with future DSM.

<sup>8</sup> Any decision to give early notice of termination would be based on the facts and circumstances at the time.

HELCO Adequacy of Supply  
2001 Unit Ratings

Unit ID	(in Gross MW)		(in Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	3.50 <sup>(1)</sup>	3.50 <sup>(1)</sup>	3.10 <sup>(1)</sup>	3.10 <sup>(1)</sup>
Shipman 3	7.50 <sup>(1)</sup>	7.50 <sup>(1)</sup>	7.10 <sup>(1)</sup>	7.10 <sup>(1)</sup>
Shipman 4	7.70 <sup>(1)</sup>	7.70 <sup>(1)</sup>	7.30 <sup>(1)</sup>	7.30 <sup>(1)</sup>
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Waimea d8	1.00	1.00	1.00	1.00
Waimea d9	1.00	1.00	1.00	1.00
Waimea d10	1.00	1.00	1.00	1.00
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 d18	2.75	2.50	2.75	2.50
Keahole d19	2.75	2.50	2.75	2.50
Keahole d20	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	13.00	13.00	13.00	13.00
Puna ct3	20.80	20.80	20.40	20.40
Puna	15.50	15.50	14.10	14.10
<b>HELCO total</b>	<b>153.00</b>	<b>150.00</b>	<b>148.20</b>	<b>145.20</b>
HCPC	22.00	22.00	22.00	22.00
PGV	28.00 <sup>(2)</sup>	28.00 <sup>(2)</sup>	28.00 <sup>(2)</sup>	28.00 <sup>(2)</sup>
HEP Phase 2	58.50 <sup>(3)</sup>	58.50 <sup>(3)</sup>	58.50 <sup>(3)</sup>	58.50 <sup>(3)</sup>
<b>IPP Total</b>	<b>108.50</b>	<b>108.50</b>	<b>108.50</b>	<b>108.50</b>
<b>System total</b>	<b>261.50</b>	<b>258.50</b>	<b>256.70</b>	<b>253.70</b>

Notes

- <sup>(1)</sup> Shipman 1 can operate at full rating only if either Shipman 3 or 4 is off line due to Title V permit restrictions
- <sup>(2)</sup> PGV has been experiencing changes in the characteristics of its steam source. During 2001, PGV generally exported to HELCO between 22 MW and 28 MW at top load. PGV plans to restore its facility to 30 MW in 2002.
- <sup>(3)</sup> The HEP Phase 2 rating was adjusted to 60 MW on June 19, 2001. Subsequently, HEP experienced problems with its steam turbine generator. By the end of 2001, HEP was exporting between 56 MW and 58.5 MW to HELCO at top load. (HEP was on a temporary outage at the time of the December 17, 2001 system peak.) HEP is working to restore the facility's output to 60 MW, and HELCO and HEP are reviewing the facility's firm capacity.



HELCO Adequacy of Supply  
2002 Unit Ratings

Attachment 2  
February 7, 2002  
Page 2 of 4

Unit ID	(in Gross MW)		(in Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00	0.00	0.00	0.00
Shipman 3	7.50	7.50	7.10	7.10
Shipman 4	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Waimea d8	0.00	0.00	0.00	0.00
Waimea d9	0.00	0.00	0.00	0.00
Waimea d10	0.00	0.00	0.00	0.00
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 d18	0.00	0.00	0.00	0.00
Keahole d19	0.00	0.00	0.00	0.00
Keahole d20	0.00	0.00	0.00	0.00
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	13.00	13.00	13.00	13.00
Puna ct3	20.80	20.80	20.40	20.40
Puna	15.50	15.50	14.10	14.10
Keahole ct4	19.90	19.90	19.90	19.90
Keahole ct5	19.90	19.90	19.90	19.90
HELCO total	178.05	175.80	173.65	171.40
HCPC	22.00 <sup>(1)</sup>	22.00 <sup>(1)</sup>	22.00 <sup>(1)</sup>	22.00 <sup>(1)</sup>
PGV	30.00 <sup>(2)</sup>	30.00 <sup>(2)</sup>	30.00 <sup>(2)</sup>	30.00 <sup>(2)</sup>
HEP Phase 2	60.00 <sup>(3)</sup>	60.00 <sup>(3)</sup>	60.00 <sup>(3)</sup>	60.00 <sup>(3)</sup>
IPP Total	112.00	112.00	112.00	112.00
System total	290.05	287.80	285.65	283.40

Notes

- <sup>(1)</sup> HCPC was derated to 18 MW at top load as of January 18, 2002. HCPC plans to restore its output to 22 MW in 2002.
- <sup>(2)</sup> PGV has been providing less than 30 MW. PGV is planning to restore its facility to 30 MW in 2002.
- <sup>(3)</sup> HEP Phase 2 was rated at 60 MW on June 19, 2001.  
The HEP DTCC facility generally has not been providing 60 MW, however, and HELCO and HEP are reviewing the facility's firm capacity.

**HELCO Adequacy of Supply  
2003 Unit Ratings**

Attachment 2  
February 7, 2002  
Page 3 of 4

Unit ID	(in Gross MW)		(in Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00	0.00	0.00	0.00
Shipman 3	7.50	7.50	7.10	7.10
Shipman 4	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Waimea d8	0.00	0.00	0.00	0.00
Waimea d9	0.00	0.00	0.00	0.00
Waimea d10	0.00	0.00	0.00	0.00
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 d18	0.00	0.00	0.00	0.00
Keahole d19	0.00	0.00	0.00	0.00
Keahole d20	0.00	0.00	0.00	0.00
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	13.00	13.00	13.00	13.00
Puna ct3	20.80	20.80	20.40	20.40
Puna	15.50	15.50	14.10	14.10
Keahole ct4	19.90	19.90	19.90	19.90
Keahole ct5	19.90	19.90	19.90	19.90
<b>HELCO total</b>	<b>178.05</b>	<b>175.80</b>	<b>173.65</b>	<b>171.40</b>
HCPC	22.00	22.00	22.00	22.00
PGV	30.00	30.00	30.00	30.00
HEP Phase 2	60.00	60.00	60.00	60.00
<b>IPP Total</b>	<b>112.00</b>	<b>112.00</b>	<b>112.00</b>	<b>112.00</b>
<b>System total</b>	<b>290.05</b>	<b>287.80</b>	<b>285.65</b>	<b>283.40</b>

**HELCO Adequacy of Supply  
2004 Unit Ratings**

Attachment 2  
February 7, 2002  
Page 4 of 4

Unit ID	(in Gross MW)		(in Net MW)	
	Reserve Rating (MW)	NTL Rating (MW)	Reserve Rating (MW)	NTL Rating (MW)
Shipman 1	0.00	0.00	0.00	0.00
Shipman 3	7.50	7.50	7.10	7.10
Shipman 4	7.70	7.70	7.30	7.30
Hill 5	14.10	14.10	13.50	13.50
Hill 6	21.40	21.40	20.20	20.20
Waimea d8	0.00	0.00	0.00	0.00
Waimea d9	0.00	0.00	0.00	0.00
Waimea d10	0.00	0.00	0.00	0.00
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 d18	0.00	0.00	0.00	0.00
Keahole d19	0.00	0.00	0.00	0.00
Keahole d20	0.00	0.00	0.00	0.00
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	13.00	13.00	13.00	13.00
Puna ct3	20.80	20.80	20.40	20.40
Puna	15.50	15.50	14.10	14.10
Keahole ct4	19.90	19.90	19.90	19.90
Keahole ct5	19.90	19.90	19.90	19.90
<b>HELCO total</b>	<b>178.05</b>	<b>175.80</b>	<b>173.65</b>	<b>171.40</b>
<b>HCPC</b>	<b>0.00<sup>(1)</sup></b>	<b>0.00<sup>(1)</sup></b>	<b>0.00<sup>(1)</sup></b>	<b>0.00<sup>(1)</sup></b>
<b>PGV</b>	<b>30.00</b>	<b>30.00</b>	<b>30.00</b>	<b>30.00</b>
<b>HEP Phase 2</b>	<b>60.00</b>	<b>60.00</b>	<b>60.00</b>	<b>60.00</b>
<b>IPP Total</b>	<b>90.00</b>	<b>90.00</b>	<b>90.00</b>	<b>90.00</b>
<b>System total</b>	<b>268.05</b>	<b>265.80</b>	<b>263.65</b>	<b>261.40</b>

Notes

- <sup>(1)</sup> HCPC PPA is assumed to be terminated December 31, 2004  
(with early shutdown assumed as of midnight, November 30, 2004 as permitted by the PPA).



Warren H. W. Lee, P.E.  
President

January 31, 2002

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PUBLIC UTILITIES  
COMMISSION

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, HELCO's Adequacy of Supply Report is due within 30 days after the end of the year. HELCO respectfully requests an extension to no later than February 8, 2002 in which to submit its report. The Consumer Advocate does not object to this request.

Very truly yours,

cc: Division of Consumer Advocacy

**REQUEST APPROVED**

  
COMMISSIONER  
PUBLIC UTILITIES COMMISSION  
STATE OF HAWAII

DATE February 4, 2002

c: Helco  
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Warren H. W. Lee, P.E.  
President

April 9, 2001

PUBLIC UTILITIES  
COMMISSION

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FILED

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The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Revision to 2001 Adequacy of Supply  
Hawaii Electric Light Company, Inc.

HELCO respectfully submits this revised 2001 Adequacy of Supply Report.<sup>1</sup> HELCO has revised the estimated HELCO unit and system capabilities for the years 2001-2003<sup>2</sup>. In addition, HELCO has revised its retirement plans for diesel units D11-17, D21-23 and D24-27, and updated the status of the Keahole Conservation District Use Permit and the air permit.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 2000 total system capability, at the time of the system peak, was 200,960 kW (net) and included firm capacity power purchases of 30,000 kW from Puna Geothermal Venture ("PGV") and 21,433 kW from HEP Phase 1<sup>3</sup>. Four MW of dispersed diesels, which were installed in November and December 1997 as part of HELCO's contingency plan, are not included as firm capacity. HELCO's system peak of 170,800 kW (net) occurred on Thursday,

<sup>1</sup> The HELCO 2001 Adequacy of Supply Report was submitted by transmittal letter dated February 15, 2001. By letter dated January 31, 2001, HELCO requested an extension to no later than February 15, 2001 to submit its Adequacy of Supply report. Commission approval was granted on February 1, 2001.

<sup>2</sup> The unit rating for Puna CT-3 has been corrected and the unit rating for the Hamakua Energy Partners, L.P. ("HEP") facility has been updated. For CT-3, an incorrect unit rating of 21.3 was used for the years 2001-2003; the correct rating is 20.4 MW. For the HEP facility, HELCO and HEP reached an agreement on March 16, 2001 on an initial firm capacity of 57.758 MW for the HEP dual-train combined cycle ("DTCC") unit. (The HEP firm capacity identified in the February 15, 2001 Adequacy of Supply Report was 59.044 MW, which was the level declared by HEP after its Phase 2 initial acceptance test.) HEP will have the opportunity to conduct a subsequent capacity test, which it plans to do after it reinstalls its second CT (now targeted for June 2001), and to establish a firm capacity of up to 60 MW, which HEP is expected to achieve. (The HEP-owned second CT sustained damage during initial testing and needed to be returned to the factory for repairs. A leased CT was temporarily substituted in its place.) As a result, the HEP rating at the time of the annual peak load has been changed to 60.0 MW from 59.044 MW. The net result of these changes increases system capabilities for the years 2001-2003 by 0.056 MW.

<sup>3</sup> HEP was in the process of testing its DTCC facility at the time of the peak and was capable of producing 30,400 kW.

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
April 9, 2001  
Page 2

December 28, 2000, at approximately 6:27 p.m., and resulted in a reserve margin of 18% over the system peak.

At the time of the system peak, HELCO had in place 29 load management contracts totaling 7,400 kW under Rider M and Schedule U, which reduced the evening peak by approximately 6,700 kW. In addition, HELCO had residential and commercial & industrial DSM programs in place, which reduced the system peak by an estimated 2,400 net kW (net of free riders). These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been approximately 179,900 kW, with a 12% reserve margin.

HELCO's expected reserve margins for the three-year period covered by this report (2001-2003) are adequate, as shown in Attachment 1. HELCO will have sufficient capacity available on its system to cover the projected monthly system peaks with scheduled maintenance and loss of the largest unit for the three-year period.

HELCO's adequacy of supply projections for the years 2001, 2002, and 2003 are based on the following:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated March 14, 2000
- The Net Reserve Ratings for HELCO units and firm capacity power purchases explained in Attachment 1.
- Continuation of the Hilo Coast Power Company ("HCPC") Second Amended and Restated PPA, as amended by Amendment No. 1, under which HCPC provides HELCO with 22,000 kW of firm capacity.<sup>4</sup> The Second Amended and Restated PPA commenced on January 1, 2000 and will continue at least until December 31, 2004, unless HELCO chooses to provide written notice of early termination.<sup>5</sup> After 2004, if the PPA is not terminated before then, the contract continues on a year to year basis, subject to termination by either HELCO or HCPC upon written termination notice issued by May 30 of the termination year.

<sup>4</sup> HCPC will provide HELCO with the firm capacity 5 days per week during a 14-hour daily on-peak period. HCPC must use its "reasonable best efforts" to provide HELCO with energy outside of the on-peak period, upon HELCO's request.

<sup>5</sup> HELCO has the right to terminate the Second Amended and Restated PPA as early as January 1, 2002. (If HELCO terminates the contract as of January 1, 2002, 2003, or 2004, a declining early termination payment will apply.)



The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
April 9, 2001  
Page 3

- HEP Phase 1 was placed in service with 21,433 kW on August 12, 2000. HEP Phase 2 provided an additional 36,325 kW of firm capacity, for a total capacity of 57,758 kW, and was placed in service on December 31, 2000.
- Installations of Keahole units CT-4 and CT-5 are projected to be August 2002 and October 2002, respectively, as explained in Attachment 1.
- Return of Shipman 3 and 4 from cold standby in March 2003 with the early termination of the HCPC contract as of January 2003<sup>6</sup>, assuming Keahole CT-4 and CT-5 are installed in 2002.
- Retirement of Kanoelehua diesel units D11 and D15-D17 and Waimea diesel units D12-14 after Keahole CT-4 and CT-5 are installed. Keahole D21-23 and four 1 MW dispersed generators D24-27 will be kept in service until at least 2004 and until such time that HELCO determines the units are no longer needed to maintain system reliability. The retirements are explained in Attachment 1.<sup>7</sup>
- The following capacity planning criteria was used to determine the need for additional generation:

*The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.*

Very truly yours,

*David W. Lee*

Attachment

cc: Division of Consumer Advocacy

- <sup>6</sup> For this to occur, written notice of termination would have to be given by May 30, 2002. Any decision whether to give written notice would be based on the facts and circumstances at the time.
- <sup>7</sup> HELCO planned to retire Kanoelehua diesel units D11 and D15-D17, Waimea diesel units D12-14 and dispersed generators D24-27 after the installation of the HEP DTCC facility. HELCO also planned to retire diesel units D21-23 after the installation of Keahole CT-4 and CT-5. Further explanation of the retirements is provided in HELCO's Contingency Plan Update #7, filed on April 2, 2001, in Docket No. 96-0029.



**Table 1  
 Adequacy of Supply**

Year	System Capability at Annual Peak Load (kW) [A]		Without Future DSM (Includes Acquired DSM) <sup>(5)</sup>		With Future DSM (Includes Acquired DSM) <sup>(6)</sup>	
			System Peak (kW) [B]	Reserve Margin (%) [[A-B]/B]	System Peak (kW) [B]	Reserve Margin (%) [[A-B]/B]
<i>Recorded</i> 2000	200,960	(1)	170,800	18%	N/A	N/A
<i>Forecasted</i> 2001	239,700	(2)	181,700	32%	173,800	38%
2002	249,250	(3)	185,500	34%	176,900	41%
2003	233,650	(4)	189,500	23%	180,100	30%

Notes:

- (1) System Capability for 2000 includes:
- HELCO units at a total of 140,460 kW – net and 144,460 kW – gross without the four 1 MW dispersed generators.
  - Firm power purchase contracts with a combined net total of 60,500 kW for the 2000 System Peak. (HEP Phase 2 was not in commercial operation, but was in the process of testing its full dual train combined cycle unit and was capable of producing 30,400 kW at the time of the peak). PGV was providing 30,100 kW at the time of the peak and HCPC was off-line due to an unplanned outage.<sup>8</sup> HEP Phase 2 was in commercial operation on December 31, 2000. HELCO and HEP reached agreement on March 16, 2001 on an initial rating of 57.758 MW for the HEP DTCC unit. (See footnote 2.)
- (2) System Capability for 2001 includes:
- HELCO units at a total of 127,700 kW – net. The capability assumes that HEP Phase 2 is in commercial operation and HCPC is in service. With the installation of HEP Phase 2, HELCO plans to retire Shipman 1 and Waimea D8-10, and place Shipman 3 and 4 on cold standby. During its initial in-service period, the HEP Phase 2 facility has experienced a number of unit trips, and HELCO is working with HEP to resolve

<sup>8</sup> Due to an unplanned outage at the HCPC facility, generation ceased from HCPC from November 20, 2000 through January 9, 2001. HCPC repaired its facility and has been providing firm capacity to the HELCO system since January 9, 2001.



operational issues involving start-up times, the transition from single-train to dual-train combined cycle operations, and HELCO's ability to dispatch the HEP facility using HELCO's Energy Management System (EMS), including Automatic Generation Control (AGC). (Operational issues are not abnormal with the start-up of a new unit.) HELCO had planned to retire Kanoelehua D11, D15-17 and Waimea D12-14 after the installation of HEP. HELCO now plans to retire these units after Keahole CT-4 and CT-5 are installed.<sup>9</sup> HELCO will continue to operate Keahole D18-19 until CT-4 is installed and Keahole D20 and CT-1 until Keahole unit CT-5 is installed. HELCO will continue to operate Keahole D21-23 until at least 2004 and until such time that HELCO determines they are not needed to maintain system reliability. The total amount of capacity scheduled for retirement and cold standby in 2001 equals 20,500 kW – net (reserve ratings).

- Firm power purchase contracts with a combined net total of 112,000 kW from PGV (30,000 kW), HCPC (22,000 kW) and HEP (60,000 kW). HEP's rating is assumed at 60 MW from July 1, 2001.

(3) System Capability for 2002 includes:

- HELCO units at a total of 159,250 kW – net. This includes the installation of Keahole CT-4 (19,900 kW net) in August 2002 and CT-5 (19,900 kW net) in October 2002. With the installation of CT-4, Keahole D18 and D19 (5,500 kW – net reserve rating) will be retired. Keahole D20 (2,750 kW – net reserve rating) will be retired with the installation of CT-5. The remaining permits or approvals required for the installation of Keahole CT-4, CT-5, and ST-7<sup>10</sup> are: (1) Board of Land and Natural Resources (“BLNR”) approval of HELCO's request for extension of the construction deadline<sup>11</sup>; and (2) Prevention of

<sup>9</sup> The diesel units have fast-starting capability and can be on-line within 90 seconds from when they are started. The fast-start diesel units are used to balance generation and load during post-contingency situations such as a generating unit trip or a transmission line outage. In addition, HELCO is expecting to add a substantial amount of wind generation to its system. The fast-start diesel units have provided flexibility in adjusting the amount of firm capacity and regulating capacity HELCO has to have online to match system load, which can fluctuate from hour-to-hour depending on the amount (and intermittent nature of) the as-available energy being provided to the system. HELCO will review whether and to what extent this flexibility will still be needed after the initial HEP operational problems are resolved, and/or after the new Keahole combustion turbines are available.

<sup>10</sup> HELCO also is seeking a BLNR permit to allow the withdrawal of water from HELCO's on-site brackish water supply well. Should there be a delay in obtaining the permit from BLNR, however, HELCO will be able to exercise a commitment for water service from the County of Hawaii.

<sup>11</sup> With respect to the amendment to its Conservation District Use Permit (“CDUP”) required to install additional generation at Keahole, HELCO obtained a default entitlement to use the land and is currently awaiting resolution of legal actions regarding the default entitlement. On September 18, 2000, the Third Circuit Court ruled that as a matter of law, absent any legal or equitable extension authorized by the BLNR pursuant to legal authority, the three-year construction deadline expired on April 26, 1999. HELCO filed a request for extension with the BLNR on October 20, 2000. On December 11, 2000, the Third Circuit Court granted the motion to stay, until BLNR rules on HELCO's request for an extension of the construction deadline. The BLNR heard HELCO's request at its January 26, 2001 meeting and decided that the extension request should be raised in a contested case hearing. At its hearing on March 9, 2001, the BLNR authorized the appointment of a hearings officer to oversee the contested case hearing and ruled that the BLNR be involved in the selection. BLNR requested that DLNR provide a list of 3 finalists for the hearings officer. The contested case hearing is expected to be concluded prior to obtaining an effective air permit.

Significant Deterioration/ Covered Source Permit ("air permit").<sup>12</sup> The service dates for Keahole CT-4 and CT-5 are expected to follow 6 and 8 months, respectively, from receipt of an effective air permit. For the purposes of conducting resource planning analysis, CT-4 and CT-5 in-service dates of August 2002 and October 2002, respectively, are assumed. Kanoelehua D11, D15-17, and Waimea D12-14 are assumed to be retired at the end of 2002 after the installation of Keahole CT-4 and CT-5. HELCO planned to retire Keahole D21-23 and Kanoelehua CT-1 after the installation of HEP and Keahole CT-4 and CT-5. HELCO now plans to retire only CT-1 at the end of 2002 after the installation of Keahole CT-4 and CT-5 and plans to continue to operate Keahole D21-23 through at least 2004 and until such time that HELCO determines the units are not needed to maintain system reliability. (HELCO also plans to keep dispersed generators D24-D27 at least through 2003 and 2004 or until such time that HELCO determines the units are not needed to maintain system reliability. D24-D27 are considered mitigation measures, as explained in HELCO's Contingency Plan and Updates, and are not counted towards HELCO total system capability.)

- Firm power purchase contracts with a combined net total of 90,000 kW from PGV (30,000 kW) and HEP (60,000 kW). HELCO may exercise its option to terminate the HCPC Second Amended and Restated PPA as of January 1, 2003, in which case HCPC most likely would not use its planned September overhaul in 2002, and would shut down as of midnight, November 30, 2002, as permitted by the agreement. For the purpose of this report, it is assumed that the HCPC firm capacity (22,000 kW) is not available after such date. (Written notice of termination must be given by May 30 of the year of termination, and a decision whether to give such notice would be based on the facts and circumstances at the time.)

(4) System Capability for 2003 includes:

- HELCO units at a total of 143,650 kW – net. With the installation of Keahole CT-4 and CT-5, HELCO plans to retire Kanoelehua CT-1 (11,400 kW). HELCO now plans to operate Keahole D21-23 totaling 8,250 kW until at least 2004 and until HELCO determines the units are not needed to maintain system reliability. Shipman 3 and 4 return from cold standby in March 2003 (if the HCPC contract is terminated). For the purpose of this report, it is assumed that the HCPC PPA is terminated as of January 1, 2003. The decision to terminate the agreement would be based on the facts and circumstances at the time the notice of termination must be given.
- Firm power purchase contracts with a combined net total of 90,000 from PGV (30,000 kW) and HEP (60,000 kW).

<sup>12</sup> With respect to the air permit, the Department of Health ("DOH") held a public hearing on the air permit on March 6, 2001, with written public comments accepted until March 13, 2001. DOH will review these comments and is expected to send the final permit and responses to these comments to the Environmental Protection Agency ("EPA") around mid-2001. HELCO continues to work with the DOH and EPA, with the objective of having the final permit issued in mid-2001 and of reaching a final resolution of any appeals to the Environmental Appeals Board as expeditiously as possible thereafter.

- (5) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):
- Implementation of full-scale DSM programs began in the first quarter of 1996 following Commission approval of the programs. The forecasted system peaks (2001-2003) include the peak reduction benefits acquired in 1996-1999 and embedded in the base peak forecast but exclude the peak reduction benefits acquired in 2000 and to be acquired in the future.
  - The system recorded peak for 2000 includes acquired DSM through the year 2000.
  - The forecasted system peaks (2001-2003) are evening peaks based on the peak forecast dated March 14, 2000.
- (6) System Peaks (With Future Peak Reduction Benefits of DSM Programs):
- The forecasted system peaks for 2001-2003 include the peak reduction benefits of the DSM programs (acquired and future) and the Rider M and Schedule U contracts.



Warren H. W. Lee, P.E.  
President

February 15, 2001

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The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

2001 FEB 15 P 4: 11  
PUBLIC UTILITIES  
COMMISSION  
FILED

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 2000 total system capability, at the time of the system peak, was 200,960 kW (net) and included firm capacity power purchases of 30,000 kW from Puna Geothermal Venture ("PGV") and 21,433 kW from Hamakua Energy Partners, L.P. ("HEP") Phase 1<sup>1</sup>. Four MW of dispersed diesels, which were installed in November and December 1997 as part of HELCO's contingency plan, are not included as firm capacity. HELCO's system peak of 170,800 kW (net) occurred on Thursday, December 28, 2000, at approximately 6:27 p.m., and resulted in a reserve margin of 18% over the system peak.

At the time of the system peak, HELCO had in place 29 load management contracts totaling 7,400 kW under Rider M and Schedule U, which reduced the evening peak by approximately 6,700 kW. In addition, HELCO had residential and commercial & industrial DSM programs in place, which reduced the system peak by an estimated 2,400 net kW (net of free riders). These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been approximately 179,900 kW, with a 12% reserve margin.

<sup>1</sup> HEP was in the process of testing its full Dual Train Combined Cycle unit (HEP Phase 2) at the time of the peak and was capable of producing 30,400 kW.

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
February 15, 2001  
Page 2

HELCO's expected reserve margins for the three-year period covered by this report (2001-2003) are adequate, as shown in Attachment 1. HELCO will have sufficient capacity available on its system to cover the projected monthly system peaks with scheduled maintenance and loss of the largest unit for the three-year period.

HELCO's adequacy of supply projections for the years 2001, 2002, and 2003 are based on the following:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated March 14, 2000
- The Net Reserve Ratings for HELCO units and firm capacity power purchases explained in Attachment 1.
- Continuation of the Hilo Coast Power Company ("HCPC") Second Amended and Restated PPA, as amended by Amendment No. 1, under which HCPC provides HELCO with 22,000 kW of firm capacity.<sup>2</sup> The Second Amended and Restated PPA commenced on January 1, 2000 and will terminate on December 31, 2004, unless HELCO chooses to provide written notice of early termination.<sup>3</sup>
- HEP Phase 1 was placed in service with 21,433 kW on August 12, 2000. According to HEP, HEP Phase 2 provided an additional 37,611 kW of firm capacity, for a total capacity of 59,044 kW<sup>4</sup>, and was placed in service on December 31, 2000.<sup>5</sup>
- Installations of Keahole units CT-4 and CT-5 are projected to be August 2002 and October 2002, respectively, as explained in Attachment 1.

<sup>2</sup> HCPC will provide HELCO with the firm capacity 5 days per week during a 14-hour daily on-peak period. HCPC must use its "reasonable best efforts" to provide HELCO with energy outside of the on-peak period, upon HELCO's request.

<sup>3</sup> HELCO has the right to terminate the Second Amended and Restated PPA as early as January 1, 2002. (If HELCO terminates the contract as of January 1, 2002, 2003, or 2004, a declining early termination payment will apply.)

<sup>4</sup> HELCO disagrees as to the appropriate level of firm capacity from the HEP facility. HELCO's position is that the minimum average capacity level that the facility was able to sustain over a 15-minute interval at maximum dispatch is lower than the 59,044 kW declared by HEP.

<sup>5</sup> The installation of the HEP Phase 2 unit will allow HELCO to retire existing units that have had retirements deferred due to contingency/mitigation measures. However, given the extended unplanned outage recently experienced by HCPC, and the trip problems experienced by HEP during its initial in-service period for Phase 2, HELCO plans to keep fast-starting diesel units Kanoelehua D11, D15, D16, D17, Waimea D12, D13, D14, and dispersed diesel units D24-27 operational in 2001 until it determines that such units are no longer necessary to maintain system reliability. HELCO will continue to operate Keahole D18-23 and CT-1 until Keahole units CT-4 and CT-5 are installed. HELCO plans to file its Generation Resource Contingency Plan Update #7 no later than March 16, 2001.



The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
February 15, 2001  
Page 3

- Return of Shipman 3 and 4 from cold standby in March 2003 with the early termination of the HCPC contract as of January 2003<sup>6</sup>, assuming Keahole CT-4 and CT-5 are installed in 2002.
- The following capacity planning criteria was used to determine the need for additional generation:

*The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.*

Very truly yours,



Attachment

cc: Division of Consumer Advocacy

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<sup>6</sup> For this to occur, written notice of termination would have to be given by May 30, 2002. Any decision whether to give written notice would be based on the facts and circumstances at the time.



**Table 1  
Adequacy of Supply**

Year	System Capability at Annual Peak Load (kW) [A]		Without Future DSM (Includes Acquired DSM) <sup>(5)</sup>		With Future DSM (Includes Acquired DSM) <sup>(6)</sup>	
			System Peak (kW) [B]	Reserve Margin (%) [[A-B]/B]	System Peak (kW) [B]	Reserve Margin (%) [[A-B]/B]
<i>Recorded</i>						
2000	200,960	(1)	170,800	18%	N/A	N/A
<i>Forecasted</i>						
2001	239,644	(2)	181,700	32%	173,800	38%
2002	230,694	(3)	185,500	24%	176,900	30%
2003	225,344	(4)	189,500	19%	180,100	25%

Notes:

(1) System Capability for 2000 includes:

- HELCO units at a total of 140,460 kW – net and 144,460 kW – gross without the four 1 MW dispersed generators.
- Firm power purchase contracts with a combined net total of 60,500 kW for the 2000 System Peak. (HEP Phase 2 was not in commercial operation, but was in the process of testing its full dual train combined cycle unit and was capable of producing 30,400 kW at the time of the peak). PGV was providing 30,100 kW at the time of the peak and HCPC was off-line due to an unplanned outage.<sup>7</sup> HEP Phase 2 was in commercial operation on December 31, 2000. HEP has declared a firm capacity of 59,044 kW with a leased combustion turbine (“CT”). The rating may change based upon future testing planned by HEP using the HEP-owned CT.<sup>8</sup>

<sup>7</sup> Due to an unplanned outage at the HCPC facility, generation ceased from HCPC from November 20, 2000 through January 9, 2001. HCPC repaired its facility and has been providing firm capacity to the HELCO system since January 9, 2001.

<sup>8</sup> The HEP-owned second CT sustained damage during initial testing and needed to be returned to the factory for repairs. A leased CT was temporarily substituted in its place. HEP has notified HELCO that it plans to conduct another capacity test once the HEP-owned CT is reinstalled.

(2) System Capability for 2001 includes:

- HELCO units at a total of 128,600 kW – net. The capability assumes that HEP Phase 2 is in commercial operation and HCPC is in service. With the installation of HEP Phase 2, HELCO plans to retire Shipman 1, and Waimea D8-10, and place Shipman 3 and 4 on cold standby. Given the extended unplanned outage recently experienced by HCPC, and the trip problems experienced by HEP during its initial in-service period for Phase 2, HELCO plans to keep fast-starting diesel units Kanoelehua D11, D15, D16, D17, Waimea D12, D13, D14, and diesel units D24, D25, D26, and D27 operational in 2001 until it determines that such units are no longer necessary to maintain system reliability. The total retirement and standby units equal 20,500 kW – net (reserve ratings).
- Firm power purchase contracts with a combined net total of 111,044 kW from PGV (30,000 kW), HCPC (22,000 kW) and HEP (59,044 kW).

(3) System Capability for 2002 includes:

- HELCO units at a total of 141,650 kW – net. This includes the installation of Keahole CT-4 (19,900 kW net) in August 2002 and CT-5 (19,900 kW net) in October 2002. With the installation of CT-4, Keahole D18 and D19 (5,500 kW – net reserve rating) will be retired. Keahole D20 (2,750 kW – net reserve rating) will be retired with the installation of CT-5. (Kanoelehua D11, D15-17, Waimea D12-14, and dispersed diesel units D24-27 are assumed to be retired in 2002.) HELCO is currently awaiting resolution of legal actions regarding the amendment to its Conservation District Use Permit and its PSD/Covered Source Permit. On September 18, 2000, the Third Circuit Court ruled that as a matter of law, absent any legal or equitable extension authorized by the Board of Land and Natural Resources (“BLNR”) pursuant to legal authority, the three-year construction deadline expired on April 26, 1999. HELCO filed a request for extension with the BLNR on October 20, 2000. The BLNR heard HELCO’s request at its January 26, 2001 meeting and decided that the extension request should be raised in a contested case hearing. No procedure or schedule for such a hearing has been determined. The Department of Health (“DOH”) has scheduled a public hearing on the air permit for March 6, 2001. HELCO continues to work with the DOH and Environmental Protection Agency (“EPA”) with the objective of having the final permit issued in mid-2001 and of reaching a final resolution of any appeals to the Environmental Appeals Board as expeditiously as possible thereafter. HELCO anticipates CT-4 and CT-5 may be in service in third quarter of 2002. For the purposes of conducting resource planning analysis, CT-4 and CT-5 in-service dates of August 2002 and October 2002, respectively, will be assumed.
- Firm power purchase contracts with a combined net total of 89,044 kW from PGV (30,000 kW) and HEP (59,044 kW). With the installation of CT-4 and CT-5, HELCO may exercise its option to terminate the HCPC Second Amended and Restated PPA as of January 1, 2003, in which case HCPC most likely would not use its planned September overhaul in 2002, and would shut down as of midnight, November 30, 2002, as permitted by the agreement. (Written notice of termination must be given by May 30 of the year of termination, and a decision whether to give such notice would be based on the facts and circumstances at the time.)



(4) System Capability for 2003 includes:

- HELCO units at a total of 136,300 kW – net. With the installation of Keahole CT4 and CT-5, HELCO will be able to retire Kanoelehua CT-1 and Keahole D21-23 totaling 19,750 kW. Shipman 3 and 4 return from cold standby in March 2003 (if the HCPC contract is terminated). For the purpose of this report, it is assumed that the HCPC PPA is terminated as of January 1, 2003. The decision to terminate the agreement would be based on the facts and circumstances at the time.
- Firm power purchase contracts with a combined net total of 89,044 from PGV (30,000 kW) and HEP (59,044 kW).

(5) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):

- Implementation of full-scale DSM programs began in the first quarter of 1996 following Commission approval of the programs. The forecasted system peaks (2001-2003) include the peak reduction benefits acquired in 1996-1999 and embedded in the base peak forecast but exclude the peak reduction benefits acquired in 2000 and to be acquired in the future.
- System recorded peak for 2000 includes acquired DSM through the year 2000.
- The forecasted system peaks (2001-2003) are evening peaks based on the peak forecast dated March 14, 2000.

(6) System Peaks (With Future Peak Reduction Benefits of DSM Programs):

- The forecasted system peaks for 2001-2003 include the peak reduction benefits of the DSM programs (acquired and future) and the Rider M and Schedule U contracts.



Warren H. W. Lee, P.E.  
President

January 31, 2001

FILED

2001 JAN 31 P 3:47

PUBLIC UTILITIES  
COMMISSION

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuaanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, HELCO's Adequacy of Supply Report is due within 30 days after the end of the year. HELCO respectfully requests an extension to no later than February 15, 2001 in which to submit its report. The Consumer Advocate does not object to this request.

Very truly yours,

cc: Division of Consumer Advocacy

**REQUEST APPROVED**

COMMISSIONER  
PUBLIC UTILITIES COMMISSION  
STATE OF HAWAII

DATE February 1, 2001

Hawaii Electric Light Company, Inc. • PO Box 1027 • Hilo, HI 96721-1027

2/21/00  
JW  
RVD  
JL



Warren H. W. Lee, P.E.  
President

February 18, 2000

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

2000 FEB 18 P 10:18  
PUBLIC UTILITIES  
FILED

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

HELCO has discovered printing problems on four pages of the HELCO Adequacy of Supply that was filed with the Commission by letter dated February 4, 2000. (The notes at the bottom of Attachment 1 are missing some text on the right-hand side, and text is missing from page 1 of Attachments 3, 4, and 5.) Replacement pages are attached.

Very truly yours,

*Warren H. W. Lee*

Attachments

cc: Division of Consumer Advocacy

**HELCO Unit Ratings**  
 As of February 4, 2000

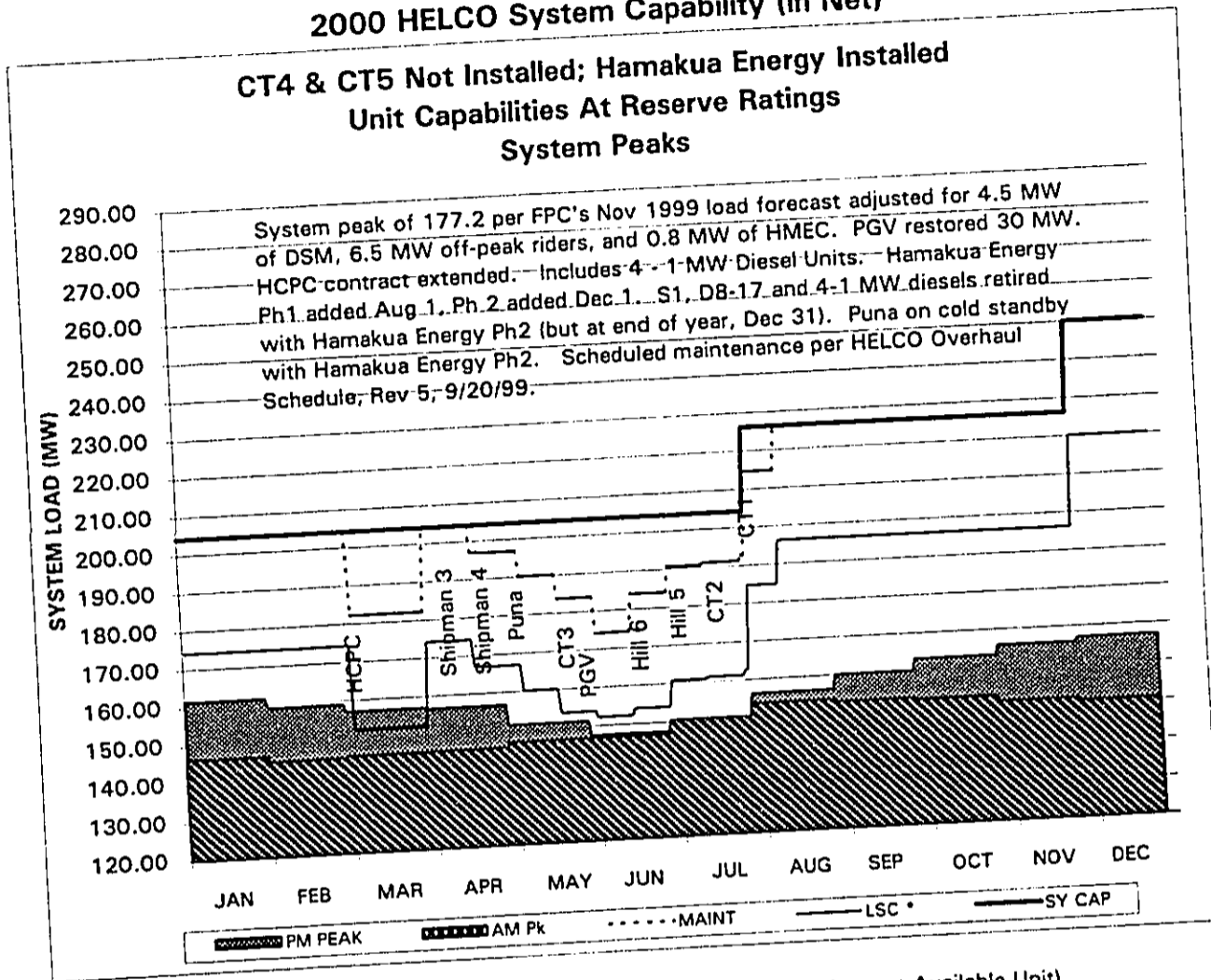
Unit ID	In Gross MW	(In Net MW)
	Reserve Rating (MW)	Reserve Rating (MW)
Shipman 1	3.40	3.10
Shipman 3	7.50	7.10
Shipman 4	7.70	7.30
Hill 5	14.10	13.50
Hill 6	21.40	20.20
Waimea D8	1.00	1.00
Waimea D9	1.00	1.00
Waimea D10	1.00	1.00
Kanoelehua D11	2.00	2.00
Waimea D12	2.75	2.75
Waimea D13	2.75	2.75
Waimea D14	2.75	2.75
Kanoelehua D15	2.75	2.75
Kanoelehua D16	2.75	2.75
Kanoelehua D17	2.75	2.75
Keahole D18	2.75	2.75
Keahole D19	2.75	2.75
Keahole D20	2.75	2.75
Keahole D21	2.75	2.75
Keahole D22	2.75	2.75
Keahole D23	2.75	2.75
Kanoelehua CT1	11.50	11.50
Keahole CT2	13.00 (2)	13.00 (2)
Puna CT3	20.80	20.40
Puna	15.50	14.10
HGPC	22.00	22.00
PGV	30.00 (3)	30.00 (3)
<b>Total</b>	<b>204.90</b>	<b>200.20</b>
dispersed diesels	4.00	4.00
<b>Total w/dispersed diesels</b>	<b>208.90</b>	<b>204.20</b>

Notes:

- (1) Shipman 3 NTL rating is 7.0 MW (gross) and 6.6 MW (net) through November 1999.
- (2) CT-2 derated to 11.00 MW for January-April 1999. After overhaul in April 1999, CT-2 derated to 13.7 MW. Base mode (continuous) rating increased to 13.9 after overhaul in October 1999. CT-2 is currently rated at 13 MW continuous base mode and 14 MW continuous peak mode. Its base mode capability varies between 13-14 MW and continuous peak mode varies between 14-14.7 MW, depending on where it is in its maintenance cycle.
- (3) Please note that while PGV is contracted to deliver 30,000 kW of firm capacity, it was derated to 28,000 kW at the time of the system peak. PGV previously anticipated that it would be able to export the full contracted capacity (30 MW) to HELCO in late December 1999 with the addition of a new well and restoration of the KS-3 and KS-4 reinjection wells. PGV obtained the necessary permits to begin drilling a new resource (production) well on September 6, 1999 and to proceed with the work needed to return the KS-3 and KS-4 reinjection wells to their original condition. Work was completed and PGV began delivering 27-28 MW to HELCO in early December. PGV made some adjustments to its steam flow earlier in the year and began delivering 30 MW from about January 12, 2000. However, PGV requires an outage (tentatively set for February 5-6 of this year) to make a permanent connection to the new KS-11 well.

Revised 2/18/00

2000 HELCO System Capability (in Net)

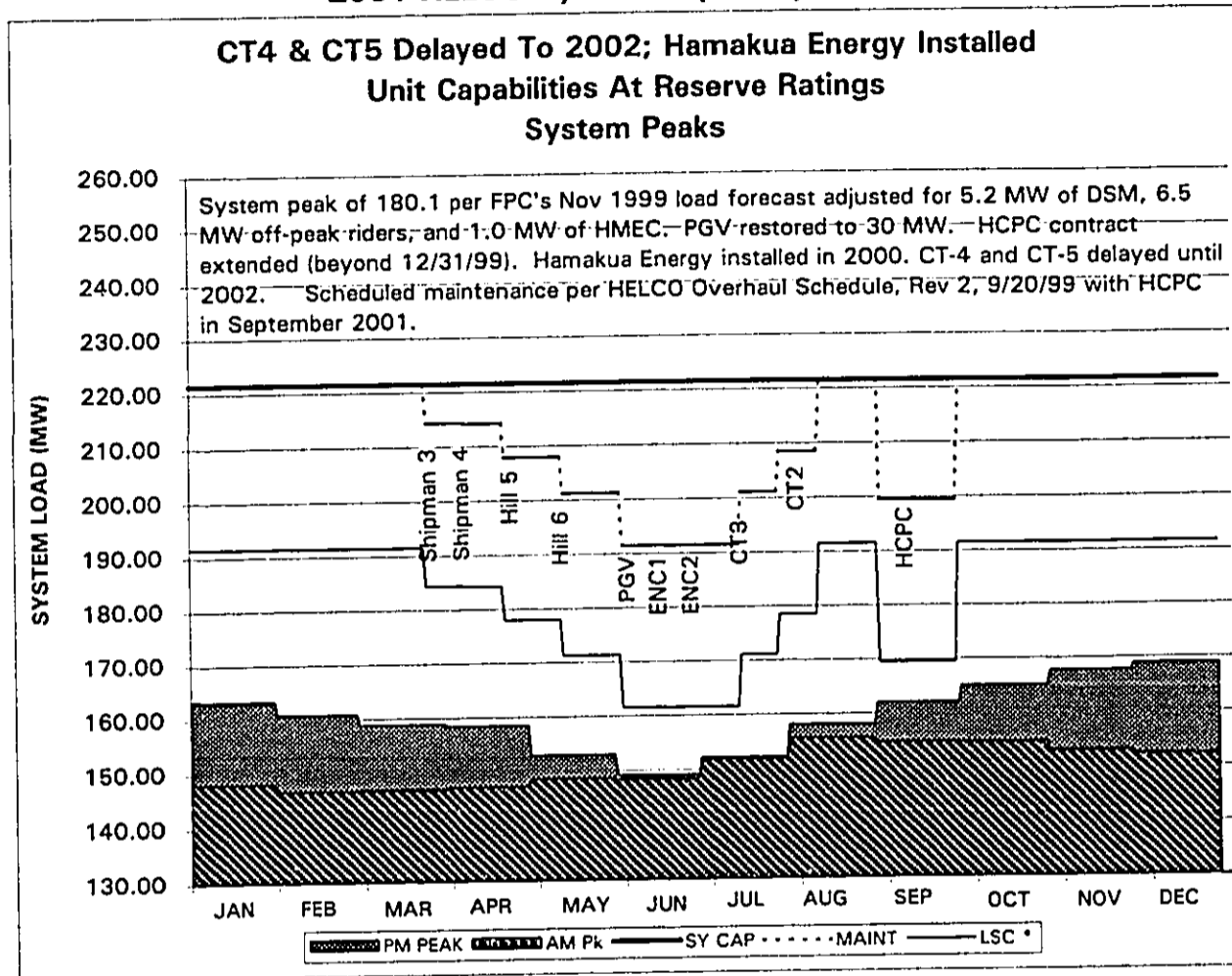


\* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)  
 \*\* LSC is lowest for the month

Month (1)	Systm Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (5) - (7)
JAN	161.5	204.2	0.0	42.7	26.5%	30.0	12.7
FEB	159.0	204.2	0.0	45.2	28.4%	30.0	15.2
MAR	157.1	204.2	22.0	25.1	16.0%	30.0	-4.9
APR	156.7	204.2	7.3	40.2	25.7%	30.0	10.2
MAY	151.3	204.2	20.4	32.5	21.5%	30.0	2.5
JUN	147.6	204.2	30.0	26.6	18.1%	22.0	4.6
JUL	150.1	204.2	20.2	33.9	22.6%	30.0	3.9
AUG	156.3	226.2	11.5	58.4	37.3%	30.0	28.4
SEP	160.2	226.2	0.0	66.0	41.2%	30.0	36.0
OCT	163.2	226.2	0.0	63.0	38.6%	30.0	33.0
NOV	165.8	226.2	0.0	60.4	36.4%	30.0	30.4
DEC	167.0	250.1	0.0	83.1	49.8%	30.0	53.1

*Revised 2/18/00*

**2001 HELCO System Capability (in Net)**



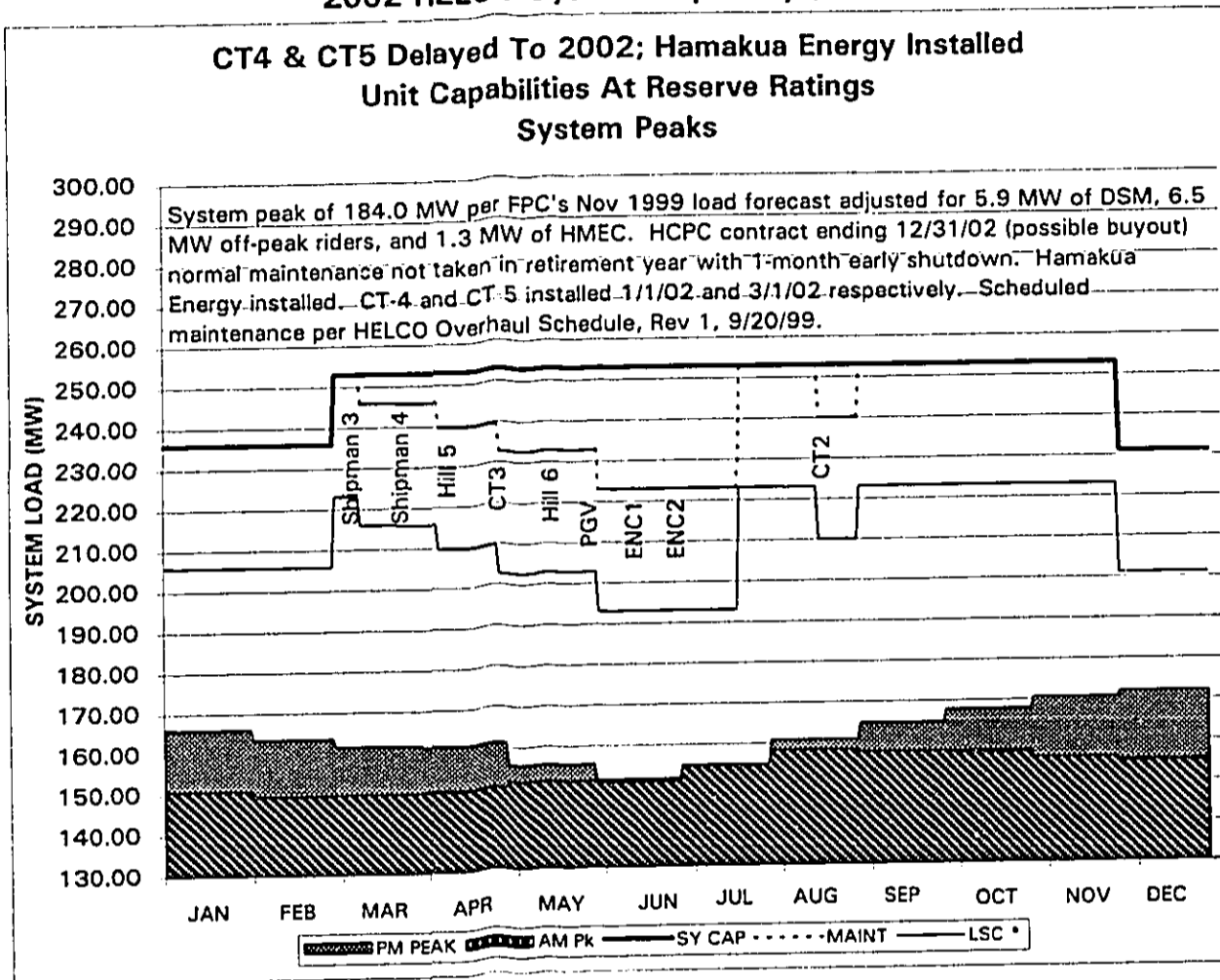
\* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)

\*\* LSC is lowest for the month

Month (1)	System Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	163.3	221.5	0.0	58.2	35.7%	30.0	28.2
FEB	160.8	221.5	0.0	60.7	37.7%	30.0	30.7
MAR	158.9	221.5	7.1	55.5	35.0%	30.0	25.5
APR	158.4	221.5	13.5	49.6	31.3%	30.0	19.6
MAY	152.9	221.5	20.2	48.4	31.6%	30.0	18.4
JUN	149.1	221.5	30.0	42.4	28.4%	30.0	12.4
JUL	151.7	221.5	30.0	39.8	26.2%	30.0	9.8
AUG	158.1	221.5	13.0	50.4	31.9%	30.0	20.4
SEP	162.0	221.5	22.0	37.5	23.2%	30.0	7.5
OCT	165.0	221.5	0.0	56.5	34.2%	30.0	26.5
NOV	167.7	221.5	0.0	53.8	32.1%	30.0	23.8
DEC	168.9	221.5	0.0	52.6	31.1%	30.0	22.6

*Revised 2/18/00*

**2002 HELCO System Capability (in Net)**



\* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)  
 \*\* LSC is lowest for the month

Month	System Pk (MW)	Systm Cap (MW)	Maint (MW)	Reserve (MW)	% Reserve (less maint)	Lrgst Avail (MW)	LSC diff** (MW)
(1)	(2)	(3)	(4)	(3)-(4)-(2)	(5) / (2)	(7)	(5) - (7)
JAN	166.0	235.9	0.0	69.9	42.1%	30.0	39.9
FEB	163.5	235.9	0.0	72.4	44.3%	30.0	42.4
MAR	161.5	253.1	7.3	84.2	52.1%	30.0	54.2
APR	161.1	253.1	20.4	71.6	44.4%	30.0	41.6
MAY	155.5	253.1	20.4	77.2	49.6%	30.0	47.2
JUN	151.6	253.1	30.0	71.5	47.1%	30.0	41.5
JUL	154.2	253.1	30.0	68.8	44.6%	30.0	38.8
AUG	160.7	253.1	13.0	79.3	49.3%	30.0	49.3
SEP	164.7	253.1	0.0	88.3	53.6%	30.0	58.3
OCT	167.8	253.1	0.0	85.2	50.8%	30.0	55.2
NOV	170.5	253.1	0.0	82.5	48.4%	30.0	52.5
DEC	171.8	231.1	0.0	59.3	34.5%	30.0	29.3

992/7/00  
15 / Gen Files  
cc: BCS  
JY  
SI  
Jm  
RVD  
JL



Warren H. W. Lee, P.E.  
President

February 4, 2000

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

FILED  
2000 FEB -4 P 3:49  
PUBLIC UTILITIES  
COMMISSION

Dear Commissioners:

Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, the following information is respectfully submitted.

HELCO's 1999 total system capability, at the time of the system peak, was 200,200 kW (net) and included firm capacity power purchases of 22,000 kW from Hilo Coast Power Company ("HCPC") and 28,000 kW from Puna Geothermal Venture ("PGV"). Four MW of dispersed diesels, which were installed in November and December 1997 as part of HELCO's contingency plan, are not included as firm capacity. HELCO's system peak of 170,200 kW (net) occurred on Monday, December 13, 1999, at approximately 6:31 p.m., and resulted in a reserve margin of 17.63% over the system peak.<sup>1</sup> At the time of the system peak, HELCO had in place 28 load management contracts totaling 7,600 kW under Rider M, Rider T, and Schedule U, which reduced the evening peak by approximately 7,000 kW. In addition, HELCO had residential and commercial & industrial DSM programs in place, which reduced the system peak by an estimated 4,000 kW. These programs include a Residential Efficient Water Heating Program, Commercial & Industrial Energy Efficiency Program, Commercial & Industrial New Construction Program, and Commercial & Industrial Customized Rebate Program. Without the DSM and off-peak rider agreements, the system peak would have been approximately 181,200 kW, with a 11.04% reserve margin.

HELCO's expected reserve margins for the three-year period covered by this report (2000-2002) are adequate as shown in Attachments 3, 4 and 5. HELCO will have sufficient capacity available on its system to cover the projected monthly system peaks with scheduled maintenance and loss of the largest unit for the three-year period.

<sup>1</sup> Without the mitigating measures that were implemented as a result of HELCO's contingency planning efforts, HELCO may not have been able to meet the peak load.



The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
February 4, 2000  
Page 2

HELCO's adequacy of supply projections for the years 2000, 2001, and 2002 are based on the following:

- The Forecast Planning Committee's Forecast of Sales, Peak and Sales Load Factor dated November 1, 1999
- Conversion to net generation, net ratings and net load forecasted peaks. Previous Adequacy of Supply filings used gross unit ratings (including unit auxiliary loads) and reported gross system peaks. The system capability charts in this Adequacy of Supply filing are based on net unit ratings and a net peak forecast. HELCO has been making a gradual change in convention from using gross unit ratings to ratings net of unit auxiliaries. HELCO converted the metering of the peak loads from gross to net in August of 1999. Net ratings have already been used in HELCO's September 1, 1998 IRP, Docket 97-0420 HELCO 1999 Test Year Rate Case and Docket 99-0207 HELCO 2000 Test Year Rate Case. The Reserve Ratings for HELCO units and firm capacity power purchases in both gross and net are shown in Attachment 1.
- The following capacity planning criteria was used to determine the need for additional generation:

*The sum of the reserve ratings of all available units, minus the reserve rating of the largest available unit, minus the reserve ratings of any units on maintenance, must be equal to or greater than the system peak load to be supplied.*
- The Commission has approved the HCPC Second Amended and Restated PPA, which allows HCPC to provide 22MW of capacity through 2004. Hamakua Energy Partners, L.P. (formerly Encogen Hawaii L.P.) is expected to have its 60MW unit available by year-end 2000. Continued delays in the installation of Keahole units CT-4 and CT-5 are anticipated, with the likely installation dates projected to be January 2002 and March 2002, respectively.<sup>2</sup>

<sup>2</sup> The status of HELCO's supply side resource plan is discussed in Attachment 2. HELCO will continue its contingency planning efforts until the Keahole units are installed. HELCO plans to file its Generation Resource Contingency Plan Update #6 in the first quarter of 2000.



The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
February 4, 2000  
Page 3

### 2000 HELCO Adequacy of Supply

Attachment 3 displays the month-to-month Load Service Capability ("LSC") for 2000. LSC is defined as the System Capability, minus all units on maintenance, minus the largest available unit. Numeric values of the difference between the LSC and the System Peak are shown in the (MW) column. LSC greater than or equal to the System Peak (load to be serviced) normally indicates that HELCO's generation capacity planning criteria is being satisfied. However, LSC margins currently include mitigation measures of which more than 36 MW are due to unit retirement deferrals and rescheduled maintenance. Had it not been for HELCO's contingency planning efforts, HELCO would be in violation of its generation planning criteria in the year 2000 as it has in every year since 1994.

HELCO's 2000 total system capability (Attachment 3) includes firm power purchase contracts of 22,000 kW from HCPC, and 30,000 kW from PGV. Also included in the total system capability is the installation of 22,000 kW for Hamakua Energy Phase 1 in late July of 2000, with the conversion to a DTCC (Hamakua Energy Phase 2) at 60,000 kW in late November of 2000. Attachment 3 includes 4 MW from HELCO's four 1 MW dispersed diesels. HELCO's plans include retiring Shipman 1, diesels D8-17 and HELCO's four 1 MW dispersed diesels at year end December 31, 2000 (after the installation of Hamakua Energy Phase 2). The Puna steam unit will be placed on cold standby, after the installation of Hamakua Energy Phase 2.

HELCO expects that there will be sufficient reserve margin to meet the system peaks in 2000 with scheduled maintenance and mitigation measures in place except in March. As mutually agreed upon pursuant to the Second Amended PPA between HELCO and HCPC, HCPC will take a four-week overhaul in March of 2000 and resume normal overhaul schedules during September for the remaining years of the contract. The March overhaul by HCPC results in a LSC margin shortfall; however, a LSC shortfall does not equate to a generation outage. Other factors need to be taken into account before any assessment of generation shortfalls can be made. For example, the loss of the largest on-line unit would have to occur at the same time as the monthly system peak. Also, the LSC margin shortfall could actually be less than shown since:

- (1) HELCO currently estimates the impact from its load management contracts to be approximately 7.0 MW, but has only adjusted the system peak by 6.5 MW.<sup>3</sup> The 6.5 MW impact is consistent with the November 1999 load forecast.

<sup>3</sup> Although HELCO's load management contracts total approximately 7.0 MW of loads curtailed at the system peak, compliance on any given night is not assured, and more importantly, the long term participation by customers has not been demonstrated.



The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
February 4, 2000  
Page 4

- (2) Contributions of HELCO's as-available resources (wind and hydro), which total approximately 24 MW, could reduce LSC margin shortfalls at the system peak.

#### 2001 HELCO Adequacy of Supply

HELCO's 2001 total system capability is shown in Attachment 4 and includes HCPC at 22,000 kW, PGV at 30,000 kW and the Hamakua Energy DTCC capacity of 60,000 kW to HELCO. CT-4 (19,900 kW) and CT-5 (19,900 kW) are assumed to be delayed until 2002 due to delays in receiving its air permit. HELCO has sufficient LSC margins to cover the projected monthly system peaks with scheduled maintenance and loss of the largest unit.

#### 2002 HELCO Adequacy of Supply

HELCO's 2002 total system capability as shown in Attachment 5 includes Keahole CT-4 installed in January 2002, CT-5 installed in March 2002 and firm power purchase contracts of 30,000 kW from PGV and 60,000 kW from Hamakua Energy. Also, included in 2002 system capability is HCPC at 22,000 kW through November 30, 2002.<sup>4</sup> HELCO will have sufficient LSC margins to cover the projected monthly system peaks with scheduled maintenance and loss of the largest unit.

Very truly yours,



Attachments

cc: Division of Consumer Advocacy

<sup>4</sup> Given the assumed installation dates of Hamakua Energy, CT-4 and CT-5, HELCO may exercise its option to terminate the HCPC Second Amended PPA as of January 1, 2003, in which case HCPC most likely would not use its planned September overhaul in 2002, and would shut down as of midnight, November 30, 2002, as permitted by the agreement. (Written notice of termination must be given by May 30 of the year of termination, and a decision whether to give such notice would be based on the facts and circumstances at the time). It is assumed for purposes of Attachment 5 that HCPC's capacity is not available after November 30, 2002.



**HELCO Unit Ratings**  
As of February 4, 2000

Unit ID	(in Gross MW)	(in Net MW)
	Reserve Rating (MW)	Reserve Rating (MW)
Shipman 1	3.40	3.10
Shipman 3	7.50	7.10
Shipman 4	7.70	7.30
Hill 5	14.10	13.50
Hill 6	21.40	20.20
Waimca D8	1.00	1.00
Waimca D9	1.00	1.00
Waimca D10	1.00	1.00
Kanoelehua D11	2.00	2.00
Waimca D12	2.75	2.75
Waimca D13	2.75	2.75
Waimca D14	2.75	2.75
Kanoelehua D15	2.75	2.75
Kanoelehua D16	2.75	2.75
Kanoelehua D17	2.75	2.75
Keahole D18	2.75	2.75
Keahole D19	2.75	2.75
Keahole D20	2.75	2.75
Keahole D21	2.75	2.75
Keahole D22	2.75	2.75
Keahole D23	2.75	2.75
Kanoelehua CT1	11.50	11.50
Keahole CT2	13.00 (2)	13.00 (2)
Puna CT3	20.80	20.40
Puna	15.50	14.10
HCPC	22.00	22.00
PGV	30.00 (3)	30.00 (3)
Total	204.90	200.20
dispersed diesels	4.00	4.00
Total w/dispersed diesel	208.90	204.20

Notes:

- (1) Shipman 3 NTL rating is 7.0 MW (gross) and 6.6 MW (net) through November 1999.
- (2) CT-2 derated to 11.00 MW for January-April 1999. After overhaul in April 1999, CT-2 derated to 13 Base mode (continuous) rating increased to 13.9 after overhaul in October 1999. CT-2 is currently ra 13 MW continuous base mode and 14 MW continuous peak mode. Its base mode capability varies be 13-14 MW and continuous peak mode varies between 14-14.7 MW, depending on where it is in its maintenance cycle.
- (3) Please note that while PGV is contracted to deliver 30,000 kW of firm capacity, it was derated to 28,0 at the time of the system peak. PGV previously anticipated that it would be able to export the full con capacity (30 MW) to HELCO in late December 1999 with the addition of a new well and restoration o KS-3 and KS-4 reinjection wells. PGV obtained the necessary permits to begin drilling a new resourc (production) well on September 6, 1999 and to proceed with the work needed to return the KS-3 and K reinjection wells to their original condition. Work was completed and PGV began delivering 27-28 M HELCO in early December. PGV made some adjustments to its steam flow earlier in the year and beg delivering 30 MW from about January 12, 2000. However, PGV requires an outage (tentatively set fo February 5-6 of this year) to make a permanent connection to the new KS-11 well.

### Status of Supply-side Resource Plan

HELCO's current supply-side resource plan includes the continued purchase of 22,000 kW of firm capacity from HCPC, the near term installation of a 60,000 kW (net) dual-train combined cycle ("DTCC") qualifying cogeneration facility by Hamakua Energy Partners L.P. (formerly known as Encogen Hawaii, L.P.) in two phases, Phase 1 (22,000 kW) and Phase 2 (38,000 kW, for a total of 60,000 kW), near Haina, Hawaii, and the installation of two combustion turbine generators, CT-4 (19,900 kW) and CT-5 (19,900 kW), at its Keahole Generating Station. CT-4 and CT-5 are the first two phases of a 56 MW (net) DTCC unit at Keahole (the third phase of which would be a steam turbine generator, ST-7). HELCO also anticipates the installation of additional non-firm capacity of up to 10,000 kW from Kahua Power Partners, LLC ("KPP") on Kahua Ranch near North Kohala, Hawaii.

The existing HELCO-HCPC Amended and Restated Power Purchase Agreement terminated on December 31, 1999. By Application filed October 12, 1999 in Docket No. 99-0346, HELCO requested Commission approval of the Second Amended and Restated PPA dated October 4, 1999 between HELCO and HCPC, as later amended by Amendment No. 1, dated November 5, 1999 (the "Second Amended PPA"). The Second Amended PPA was approved by the Commission in Docket No. 99-0346 by Decision and Order No. 17397, issued December 7, 1999. Under the Second Amended PPA, HCPC will provide HELCO with 22 MW of firm capacity 5 days per week for a 14-hour period in a 16-hour window (from 6:00 A.M. to 10:00 P.M.). HELCO will use its reasonable best efforts to dispatch HCPC at a minimum average load level of 18 MW. HCPC will also use its reasonable best efforts to provide HELCO with energy outside of the weekday on-peak period, upon HELCO's request. The Second Amended PPA commenced on January 1, 2000 and will terminate on December 31, 2004, unless HELCO chooses to provide written notice of early termination. HELCO could terminate the Second Amended PPA as early as January 1, 2002. If HELCO terminates the contract as of January 1, 2002, 2003, or 2004, a declining early termination payment will apply.

HELCO's Power Purchase Agreement with Encogen Hawaii, L.P. ("Encogen") dated October 22, 1997, as amended January 14, 1999, and the Interconnection Agreement dated October 22, 1997 (collectively, the "Encogen contracts"), were approved in Docket No. 98-0013 by Decision and Order No. 17077, filed July 14, 1999, as amended by Order No. 17089, filed July 21, 1999. The appeal period of the Commission order approving the PPA ended on August 23, 1999. No appeals of the Commission order were filed.

HELCO entered into a Power Purchase Agreement Novation ("Novation") with Encogen and Hamakua Energy Partners, L.P. ("Hamakua Energy") on November 8, 1999. The Novation transferred the liabilities and obligations of Encogen under the Encogen contracts to Hamakua Energy as of November 8, 1999. Hamakua Energy is a Hawaii limited partnership whose general partners are TPS Hamakua, Inc., a Florida corporation and Jones Hamakua, Inc., a Hawaii

corporation. Hamakua Energy's limited partners are TPS Hawaii, Inc., a Florida corporation, and Jones Hawaii Power, Inc., a Hawaii corporation. Please refer to HELCO's letter to the Commission filed December 6, 1999 in Docket No. 98-0013 for additional information concerning the general and limited partners of Hamakua Energy.

Based on information provided by Hamakua Energy, HELCO expects that Phase 1 of the Hamakua Energy facility will be in service in late July 2000, and Phase 2 will be in service in late November 2000.

The timing of the installation of HELCO's CT-4, CT-5, and ST-7 units at Keahole has been revised several times due to delays in: (a) obtaining approval from the State Board of Land and Natural Resources ("BLNR") of a Conservation District Use Permit amendment, and (b) obtaining from the State Department of Health ("DOH") and the U.S. Environmental Protection Agency ("EPA") a Prevention of Significant Deterioration/Covered Source permit ("air permit") for the Keahole site. The only remaining permit required for the installation of CT-4, CT-5 and ST-7 at Keahole is the air permit.

The DOH held a public hearing on October 7, 1999 regarding DOH's response to the remand order issued by the EAB. By letter dated December 9, 1999 to the DOH, the EPA indicated its position that additional air quality monitoring data should be collected to support issuance of the final Keahole CT-4, CT-5 PSD air permit. Although according to the letter, EPA adopted this position after reviewing Supplement C of the DOH's Ambient Air Quality Impact Report that was issued in August 1999, HELCO's understanding is that the EPA reviewed the information in Supplement C with DOH prior to August 1999 and did not object to the data. By letter dated January 5, 2000, the DOH concurred with EPA's position and directed that additional air quality data be gathered. Notwithstanding HELCO's position that the data currently described in Supplement C is valid for supporting issuance of the final permit, HELCO is working to respond to the matters raised in the EPA and DOH letters. Resolution of these matters with the EPA and DOH will result in delays to the anticipated issuance of the final air permit to later this year. If there is another appeal to the EAB, the effective date of the air permit would be delayed pending resolution of the appeal. The service dates for CT-4 and CT-5 would follow 6 and 8 months, respectively, from receipt of an effective air permit. Thus, CT-4 and CT-5 could be placed in service in mid-2001, if there are no appeals to the EAB, or early-2002, if there are appeals. For the purposes of conducting resource planning analyses, CT-4 and CT-5 in service dates of January 2002 and March 2002, respectively, will be assumed.

A Power Purchase Contract for As-Available Energy ("PPC") between HELCO and KPP was signed on August 17, 1999. KPP's plans call for a 10,000 kW wind facility on Kahua Ranch, Hawaii. Items proposed by HELCO for the interconnection facilities are currently being reviewed and HELCO expects to file an Application for Commission approval of the PPC between HELCO and KPP some time in the first quarter of 2000. Allowing for a reasonable time

14.

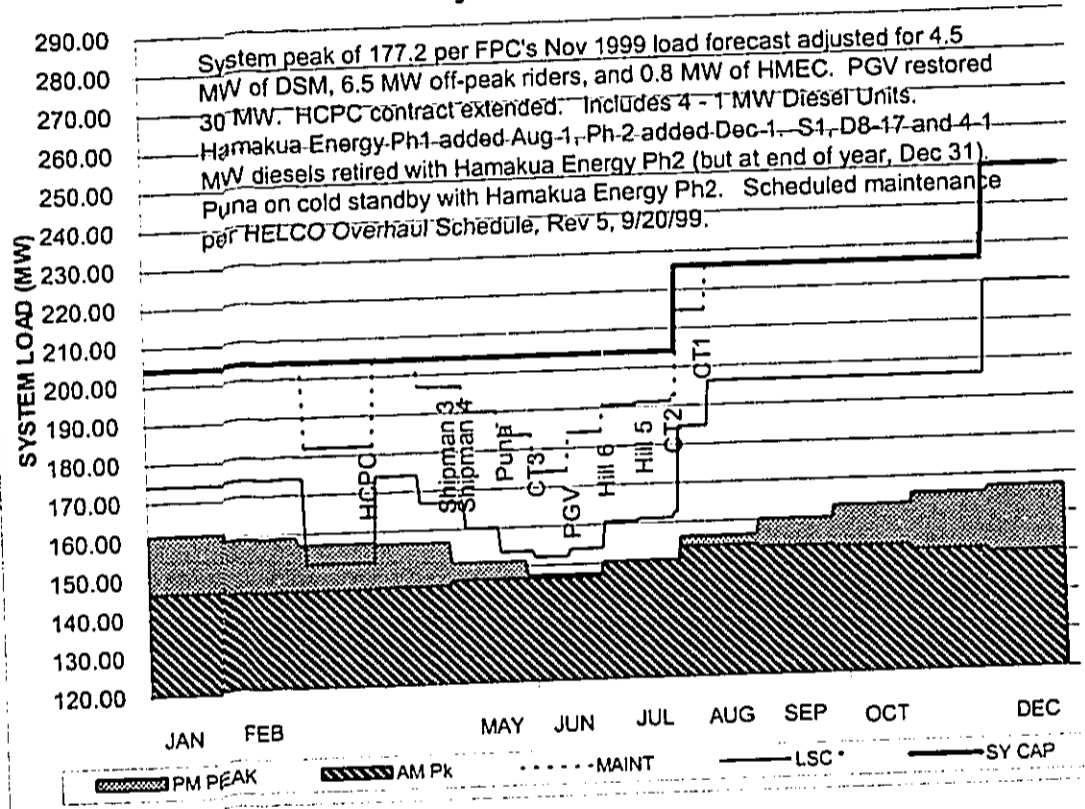
ATTACHMENT 2  
February 4, 2000  
Page 3 of 3

for Commission review and approval, HELCO anticipates KPP could be in-service by the first quarter of 2001.

HELCO expects to file Contingency Plan Update #6 by March 31, 2000, which will report the progress and accomplishments made toward maximizing the capacity of available generation, the additional capacity added to the system, and load management activities, pending installation of the next substantial increment of new capacity.

**2000 HELCO System Capability (in Net)**

**CT4 & CT5 Not Installed; Hamakua Energy Installed  
 Unit Capabilities At Reserve Ratings  
 System Peaks**



\* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)  
 \*\* LSC is lowest for the month

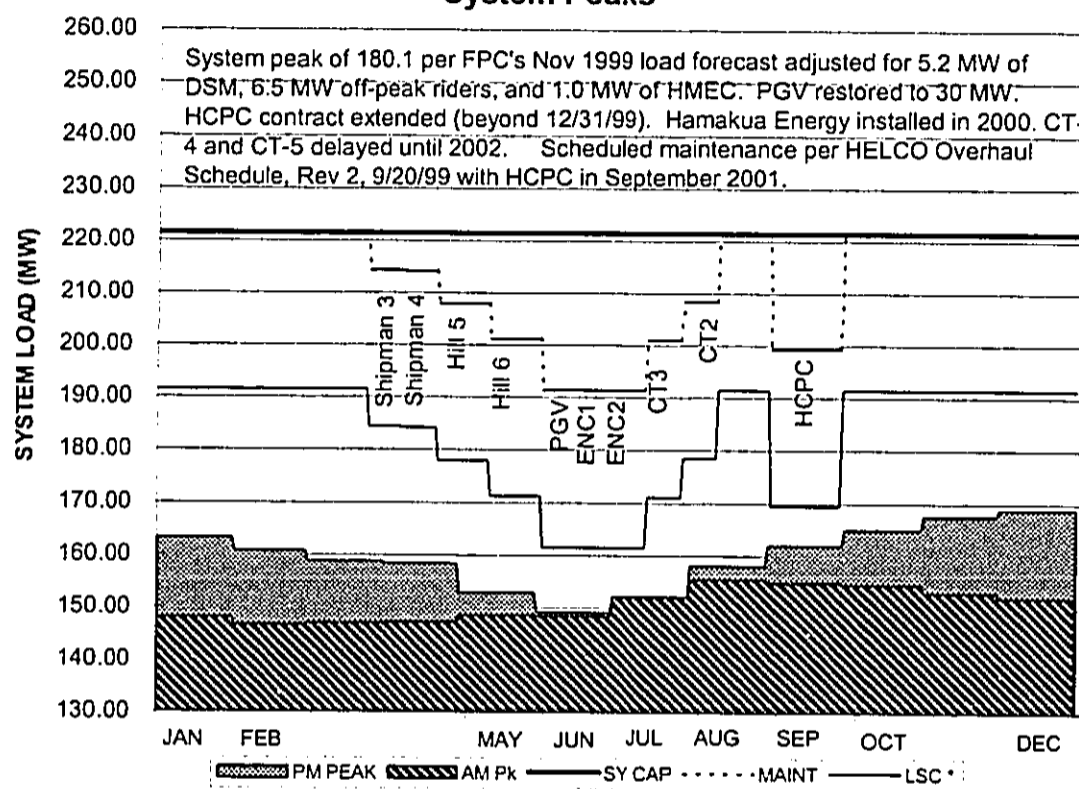
Month (1)	Systm Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	161.5	204.2	0.0	42.7	26.5%	30.0	12.7
FEB	159.0	204.2	0.0	45.2	28.4%	30.0	15.2
MAR	157.1	204.2	22.0	25.1	16.0%	30.0	-4.9
APR	156.7	204.2	7.3	40.2	25.7%	30.0	10.2
MAY	151.3	204.2	20.4	32.5	21.5%	30.0	2.5
JUN	147.6	204.2	30.0	26.6	18.1%	22.0	4.6
JUL	150.1	204.2	20.2	33.9	22.6%	30.0	3.9
AUG	156.3	226.2	11.5	58.4	37.3%	30.0	28.4
SEP	160.2	226.2	0.0	66.0	41.2%	30.0	36.0
OCT	163.2	226.2	0.0	63.0	38.6%	30.0	33.0
NOV	165.8	226.2	0.0	60.4	36.4%	30.0	30.4
DEC	167.0	250.1	0.0	83.1	49.8%	30.0	53.1



NOTES:

- Attachment 3 includes contingency plan measures: Four – 1 MW diesel units and 36.4 MW of retirement deferrals.
- HCPC contract is available at 22,000 kW under the Second Amended PPA, and PGV is at 30,000 kW of capacity.
- Hamakua Energy Phase 1 at 22,000 kW is installed in late July 2000 and is converted into Phase 2 DTCC at 60,000 kW in late November 2000.
- Upon completion of the Hamakua Energy DTCC in late November 2000, Shipman 1 (3,100 kW), Waimea D-8, D-9, D-10, D-12, D-13, and D-14 (totaling 11,250 kW), Kanoelehua D-11, D-15, D-16 and D-17 (totaling 10,250 kW), and four – 1 MW dispersed diesel units are scheduled for retirement at the end of the year on December 31, 2000. The total capacity slated for retirement when the Hamakua Energy DTCC is placed into service is 28,600 kW.
- Puna is placed on cold standby with the installation of Hamakua Energy DTCC.

**2001 HELCO System Capability (in Net)**  
**CT4 & CT5 Delayed To 2002; Hamakua Energy Installed**  
**Unit Capabilities At Reserve Ratings**  
**System Peaks**



\* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)

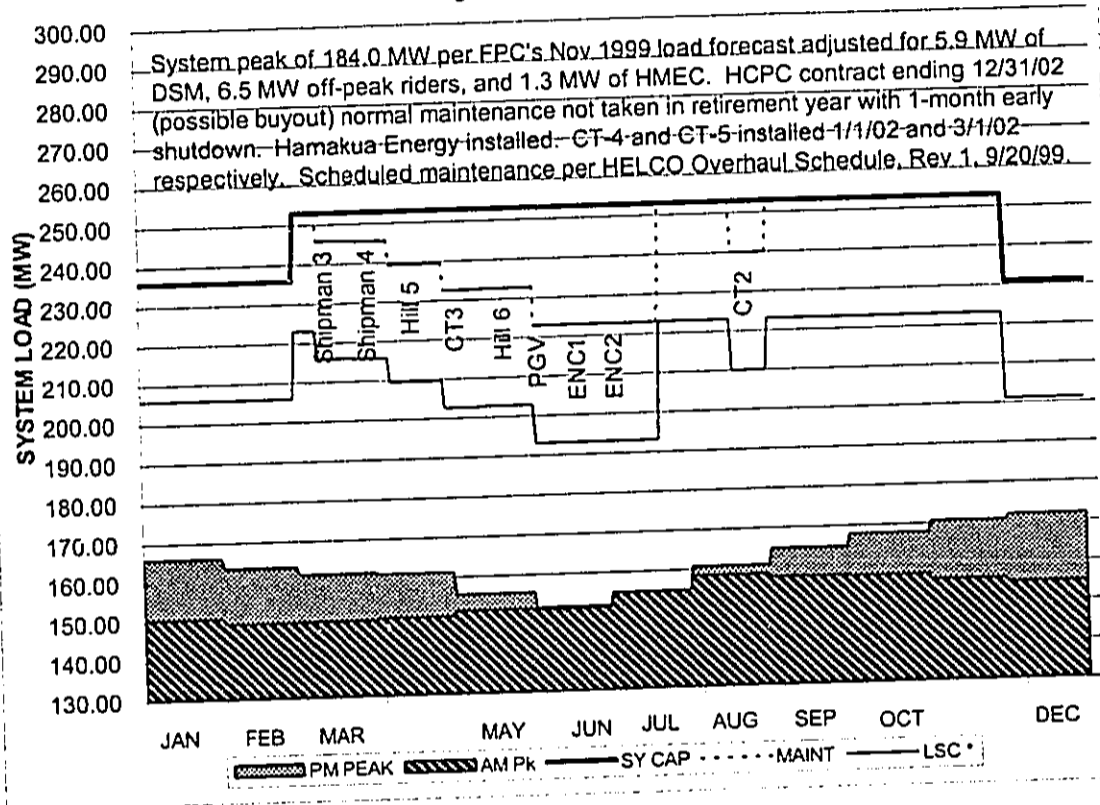
\*\* LSC is lowest for the month

Month (1)	System Pk (MW) (2)	System Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	163.3	221.5	0.0	58.2	35.7%	30.0	28.2
FEB	160.8	221.5	0.0	60.7	37.7%	30.0	30.7
MAR	158.9	221.5	7.1	55.5	35.0%	30.0	25.5
APR	158.4	221.5	13.5	49.6	31.3%	30.0	19.6
MAY	152.9	221.5	20.2	48.4	31.6%	30.0	18.4
JUN	149.1	221.5	30.0	42.4	28.4%	30.0	12.4
JUL	151.7	221.5	30.0	39.8	26.2%	30.0	9.8
AUG	158.1	221.5	13.0	50.4	31.9%	30.0	20.4
SEP	162.0	221.5	22.0	37.5	23.2%	30.0	7.5
OCT	165.0	221.5	0.0	56.5	34.2%	30.0	26.5
NOV	167.7	221.5	0.0	53.8	32.1%	30.0	23.8
DEC	168.9	221.5	0.0	52.6	31.1%	30.0	22.6

NOTES:

- Attachment 4 assumes the installation of Hamakua Energy's dual train combined cycle facility at 60,000 kW, HCPC is available at 22,000 kW under the Second Amended PPA, and PGV is at 30,000 kW.
- Keahole CT-4 and CT-5 are assumed to be delayed until 2002.
- Attachment 4 includes contingency plan measures: unit retirement deferrals of Keahole diesels D18 through D23 and CT-1 (totaling 28,000 kW until both Hamakua Energy DTCC and Keahole CT-4 and CT-5 are completed).

**2002 HELCO System Capability (in Net)**  
**CT4 & CT5 Delayed To 2002; Hamakua Energy Installed**  
**Unit Capabilities At Reserve Ratings**  
**System Peaks**



\* LSC is Load Service Capability (System Capability - Maintenance - Largest Available Unit)  
 \*\* LSC is lowest for the month

Month (1)	System Pk (MW) (2)	Systm Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (3)-(4)-(2)	% Reserve (less maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC diff** (MW) (5) - (7)
JAN	166.0	235.9	0.0	69.9	42.1%	30.0	39.9
FEB	163.5	235.9	0.0	72.4	44.3%	30.0	42.4
MAR	161.5	253.1	7.3	84.2	52.1%	30.0	54.2
APR	161.1	253.1	20.4	71.6	44.4%	30.0	41.6
MAY	155.5	253.1	20.4	77.2	49.6%	30.0	47.2
JUN	151.6	253.1	30.0	71.5	47.1%	30.0	41.5
JUL	154.2	253.1	30.0	68.8	44.6%	30.0	38.8
AUG	160.7	253.1	13.0	79.3	49.3%	30.0	49.3
SEP	164.7	253.1	0.0	88.3	53.6%	30.0	58.3
OCT	167.8	253.1	0.0	85.2	50.8%	30.0	55.2
NOV	170.5	253.1	0.0	82.5	48.4%	30.0	52.5
DEC	171.8	231.1	0.0	59.3	34.5%	30.0	29.3

NOTES:

- Attachment 5 assumes Hamakua Energy DTCC is installed at 60,000 kW, PGV is at 30,000 kW, and buyout of HCPC contract for the beginning of 2003. With the buyout, HCPC would likely not use their overhaul period in September of 2002 and stop supplying energy to HELCO beginning December 2002.
- Keahole CT-4 and CT-5 are assumed to be installed in January 2002 and March 2002.
- Attachment 5 includes contingency plan measures: unit retirement deferrals of Keahole diesels D18 and D19 (totaling 5,500 kW until the installation of Keahole CT-4), D20 (at 2,750 kW after the installation of Keahole CT-5), CT-1, and Keahole diesels D21, D22 and D23 (totaling 19,750 kW until the end of 2002 assuming that both Hamakua Energy DTCC and Keahole CT-4 and CT-5 are completed).



Warren H. W. Lee, P.E.  
President

January 31, 2000

The Honorable Chairman and Members of the  
Hawaii Public Utilities Commission  
465 South King Street  
Kekuanaoa Building, 1st Floor  
Honolulu, Hawaii 96813

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PUBLIC UTILITIES  
COMMISSION

Dear Commissioners:

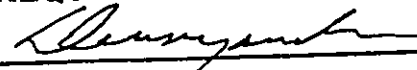
Subject: Adequacy of Supply  
Hawaii Electric Light Company, Inc.

In accordance with paragraph 5.3a of General Order No. 7, HELCO's Adequacy of Supply Report is due within 30 days after the end of the year. HELCO respectfully requests a one week extension in which to submit its report; until February 7, 2000.

Very truly yours,

cc: Division of Consumer Advocacy

**REQUEST APPROVED**

  
COMMISSIONER  
PUBLIC UTILITIES COMMISSION  
STATE OF HAWAII  
DATE FEB 1 2000