HAWAIIAN ELECTRIC COMPANY, INC.

Summary of Cost-Benefit Analysis of Utility CHP Program

	Base Case - No Utility CHP Program			Alternate Case - With Utility CHP Program			System Benefits Due To Utility-CHP Program							
Year	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Change In System Capacity Cost Revenue Requirements ($000s)	Change In System Energy Cost Revenue Requirements ($000s)	Total Change In System Cost ($000s)	Total Incremental Revenues From Retained Load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(B)	(C)	(D = B + C)	(E)	(F)	(G = E + F)	(H = B - E)	(I = C - F)	(J = H + I)	(K)	(L)	(M)	(N)	[O = Σ(J:N)]
2003	$211,439	$349,388	$560,827	$211,506	$349,466	$560,972	-$67	-$78	-$145	$103.1	$15.2	$3.6	($9.3)	($32.4)
2004	$219,299	$370,645	$589,944	$219,898	$371,009	$590,907	-$599	-$364	-$963	$183.2	$165.4	$32.0	($96.0)	($678.4)
2005	$221,284	$384,736	$606,020	$222,643	$385,800	$608,443	-$1,359	-$1,064	-$2,423	$648.6	$431.2	$79.6	($243.6)	($1,507.2)
2006	$224,664	$392,954	$617,618	$226,914	$394,773	$621,687	-$2,250	-$1,819	-$4,069	$1,095.6	$692.6	$124.4	($382.8)	($2,539.2)
2007	$226,554	$422,981	$649,535	$229,724	$425,578	$655,302	-$3,170	-$2,597	-$5,767	$1,616.9	$1,093.9	$191.6	($591.0)	($3,455.6)
2008	$228,680	$442,374	$671,054	$232,878	$445,864	$678,742	-$4,198	-$3,490	-$7,688	$1,914.2	$1,512.3	$258.9	($801.0)	($4,803.6)
2009	$247,358	$477,834	$725,192	$235,957	$482,257	$718,214	$11,401	-$4,423	$6,978	$2,862.3	$1,768.9	$296.2	($1,081.7)	$10,823.7
2010	$254,201	$502,600	$756,801	$257,189	$507,660	$764,849	-$2,988	-$5,060	-$8,048	$3,696.3	$1,831.9	$300.4	($1,235.1)	($3,454.5)
2011	$256,463	$526,631	$783,094	$264,154	$532,107	$796,261	-$7,691	-$5,476	-$13,167	$4,146.0	$1,890.8	$303.7	($1,357.5)	($8,184.0)
2012	$259,351	$547,892	$807,243	$267,308	$553,661	$820,969	-$7,957	-$5,769	-$13,726	$4,667.1	$1,945.3	$306.2	($1,453.6)	($8,261.0)
2013	$262,379	$568,069	$830,448	$270,548	$574,538	$845,086	-$8,169	-$6,469	-$14,638	$5,136.0	$2,000.4	$308.7	($1,541.8)	($8,734.7)
2014	$265,248	$586,614	$851,862	$273,484	$593,674	$867,158	-$8,236	-$7,060	-$15,296	$5,637.3	$2,050.6	$310.3	($1,603.0)	($8,900.8)
2015	$287,932	$616,679	$904,611	$276,481	$624,058	$900,539	$11,451	-$7,379	$4,072	$6,289.3	$2,101.3	$312.0	($1,664.3)	$11,110.3
2016	$376,467	$597,362	$973,829	$359,282	$604,807	$964,089	$17,185	-$7,445	$9,740	$6,549.5	$2,192.2	$313.7	($1,730.2)	$17,065.2
2017	$377,280	$620,030	$997,310	$359,919	$631,364	$991,283	$17,361	-$11,334	$6,027	$7,185.4	$2,282.9	$315.2	($1,780.8)	$14,029.7
2018	$375,714	$648,655	$1,024,369	$359,231	$662,134	$1,021,365	$16,483	-$13,479	$3,004	$7,945.9	$2,374.3	$316.7	($1,836.1)	$11,804.8
2019	$374,456	$678,963	$1,053,419	$358,756	$693,177	$1,051,933	$15,700	-$14,214	$1,486	$8,795.6	$2,463.4	$318.0	($1,876.6)	$11,186.4
2020	$373,159	$708,166	$1,081,325	$358,194	$723,266	$1,081,460	$14,965	-$15,100	-$135	$9,481.4	$2,553.1	$319.3	($1,922.4)	$10,296.4
2021	$395,670	$737,871	$1,133,541	$383,292	$750,809	$1,134,101	$12,378	-$12,938	-$560	$10,092.5	$2,638.7	$320.0	($1,937.8)	$10,553.4
2022	$369,448	$788,310	$1,157,758	$383,188	$802,095	$1,185,283	-$13,740	-$13,785	-$27,525	$11,019.6	$2,729.3	$321.3	($1,978.4)	($15,433.2)
NPV ($000s)							**$10,662**	**($50,759)**	**($40,098)**	**$35,916**	**$14,203**	**$2,171**	**($9,929)**	**$2,262**

Reference:
Col. B - See Workpaper H, Page 2, Col. 9.
Col. C - See Workpaper H, Page 2, Col. 8.
Col. E - See Workpaper H, Page 3, Col. 9 + Page 10, Col. 4.
Col. F - See Workpaper H, Page 3, Col. 8 + Page 11, Col. 4 + Page 11, Col. 6.
Col. K - See Exhibit H, Page 3, Col. V.
Col. L - For 2003-2008, See Workpaper H, Page 12, Col. N. For 2009-2022, See Workpaper H, Page 13, Col. K.
Col. M - For 2003-2008, See Workpaper H, Page 12, Col. O. For 2009-2022, See Workpaper H, Page 13, Col. L.
Col. N - For 2003-2008, See Workpaper H, Page 12, Col. L. For 2009-2022, See Workpaper H, Page 13, Co. I.

HAWAIIAN ELECTRIC COMPANY, INC.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 1 of 2)

	Base Case - No Utility CHP Program						Alternate Case - With Utility CHP Program						
Year	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Fixed Cost Embedded In Schedule P (¢/kWh)[1]	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Avg Energy Cost For Central Plant (¢/kWH)	Lost FC Rev From Avoided A/C Load (¢/kWh)[2]
(A)	(B)	(C)	(D)	(E = C + D)	(F = D ÷ B)	(G)	(H = B + R - S)	(I)	(J)	(K = I + J)	(L = J ÷ H)	(M)	(N)
2003	7,538,000	$211,439	$349,388	$560,827	4.64	4.451	7,539,022	$211,506	$349,466	$560,972	4.64	4.64	-3.53
2004	7,706,000	$219,299	$370,645	$589,944	4.81	4.451	7,706,803	$219,898	$371,009	$590,907	4.81	4.81	-3.53
2005	7,818,000	$221,284	$384,736	$606,020	4.92	4.451	7,821,911	$222,643	$385,800	$608,443	4.93	4.92	-3.53
2006	7,946,000	$224,664	$392,954	$617,618	4.95	4.585	7,952,868	$226,914	$394,773	$621,687	4.96	4.94	-3.64
2007	8,034,000	$226,554	$422,981	$649,535	5.26	4.585	8,043,147	$229,724	$425,578	$655,302	5.29	5.26	-3.64
2008	8,095,000	$228,680	$442,374	$671,054	5.46	4.585	8,104,060	$232,878	$445,864	$678,742	5.50	5.46	-3.64
2009	8,149,000	$247,358	$477,834	$725,192	5.86	4.723	8,162,216	$235,957	$482,257	$718,214	5.91	5.86	-3.75
2010	8,210,000	$254,201	$502,600	$756,801	6.12	4.723	8,228,090	$257,189	$507,660	$764,849	6.17	6.11	-3.75
2011	8,287,000	$256,463	$526,631	$783,094	6.35	4.723	8,306,569	$264,154	$532,107	$796,261	6.41	6.35	-3.75
2012	8,364,000	$259,351	$547,892	$807,243	6.55	4.865	8,385,772	$267,308	$553,661	$820,969	6.60	6.54	-3.86
2013	8,442,000	$262,379	$568,069	$830,448	6.73	4.865	8,465,854	$270,548	$574,538	$845,086	6.79	6.72	-3.86
2014	8,519,000	$265,248	$586,614	$851,862	6.89	4.865	8,545,587	$273,484	$593,674	$867,158	6.95	6.87	-3.86
2015	8,596,000	$287,932	$616,679	$904,611	7.17	5.011	8,625,318	$276,481	$624,058	$900,539	7.24	7.16	-3.98
2016	8,651,000	$376,467	$597,362	$973,829	6.91	5.011	8,683,139	$359,282	$604,807	$964,089	6.97	6.87	-3.98
2017	8,717,000	$377,280	$620,030	$997,310	7.11	5.011	8,752,326	$359,919	$631,364	$991,283	7.21	7.12	-3.98
2018	8,794,000	$375,714	$648,655	$1,024,369	7.38	5.161	8,832,608	$359,231	$662,134	$1,021,365	7.50	7.39	-4.10
2019	8,870,000	$374,456	$678,963	$1,053,419	7.65	5.161	8,913,063	$358,756	$693,177	$1,051,933	7.78	7.66	-4.10
2020	8,950,000	$373,159	$708,166	$1,081,325	7.91	5.161	8,996,039	$358,194	$723,266	$1,081,460	8.04	7.92	-4.10
2021	9,005,000	$395,670	$737,871	$1,133,541	8.19	5.316	9,053,177	$383,292	$750,809	$1,134,101	8.29	8.17	-4.22
2022	9,061,000	$369,448	$788,310	$1,157,758	8.70	5.316	9,112,030	$383,188	$802,095	$1,185,283	8.80	8.68	-4.22
NPV ($000s)				$7,805,403						$7,845,500			

Reference:
Col. B - See Workpaper H, Page 2, Col. 1 x 1000 x (1-.0495). Assumes T&D loss factor of 4.95%.
Col. C - See Workpaper H, Page 2, Col. 9.
Col. D - See Workpaper H, Page 2, Col. 8.
Col. I - See Workpaper H, Page 3, Col. 9 + Page 10, Col. 4.
Col. J - See Workpaper H, Page 3, Col. B + Page 11, Col. 4 + Page 11, Col. 6.
Col. M - For 2003-2008, See Workpaper H, Page 3, Col. 8 ÷ (Col. H - Workpaper H, Page 12, Col. K).
For 2009-2022, See Workpaper H, Page 3, Col. 8 ÷ (Col. H - Workpaper H, Page 13, Col. G).

[1] FC embedded in Schedule P base rates effective January 1, 1997 is 4.451 ¢/kWh. Escalated by 3% every 3 years to approximate rate increase impact.
[2] Based on rate analysis for 10 target Utility-CHP customers, and escalated by 3% every 3 years to approximate rate increase impact.

HAWAIIAN ELECTRIC COMPANY, INC.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 2 of 2)

	Change in System Costs			Estimated Incremental Revenues From Utility-CHP Program									
Year	Change in System Capacity Cost Revenue Requirements ($000s)	Change in System Energy Cost Revenue Requirements ($000s)	Total Change System Cost ($000s)	Retained Sales (MWH)	Avoided A/C Load (MWH)	Total Retained Revenues From Retained Sales ($000/Yr)	Lost FC Revenues From Avoided A/C Load ($000/Yr)	Net Retained Revenues From Retained Load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Total Incremental Revenues From the Utility-CHP Program ($000/Yr)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(O = C - I)	(P = D - J)	(Q = O + P)	(R)	(S)	[T = (G+M) x R]	(U = N x S)	(V = T + U)	(W)	(X)	(Y)	[Z = Σ(V:Y)]	(AA = Q + Z)
2003	-$67	-$78	-$145	1,206	184	$109.6	($6.5)	$103.1	$15.2	$3.6	($9.3)	$112.6	($32.4)
2004	-$599	-$364	-$963	2,702	1,899	$250.2	($67.0)	$183.2	$165.4	$32.0	($96.0)	$284.6	($678.4)
2005	-$1,359	-$1,064	-$2,423	8,741	4,830	$819.1	($170.5)	$648.6	$431.2	$79.6	($243.6)	$915.8	($1,507.2)
2006	-$2,250	-$1,819	-$4,069	14,368	7,500	$1,368.6	($273.0)	$1,095.6	$692.6	$124.4	($382.8)	$1,529.8	($2,539.2)
2007	-$3,170	-$2,597	-$5,767	20,692	11,545	$2,037.1	($420.2)	$1,616.9	$1,093.9	$191.6	($591.0)	$2,311.4	($3,455.6)
2008	-$4,198	-$3,490	-$7,688	24,737	15,677	$2,484.8	($570.6)	$1,914.2	$1,512.3	$258.9	($801.0)	$2,884.4	($4,803.6)
2009	$11,401	-$4,423	$6,978	34,637	21,421	$3,665.6	($803.3)	$2,862.3	$1,768.9	$296.2	($1,081.7)	$3,845.7	$10,823.7
2010	-$2,988	-$5,060	-$8,048	42,608	24,518	$4,615.7	($919.4)	$3,696.3	$1,831.9	$300.4	($1,235.1)	$4,593.5	($3,454.5)
2011	-$7,691	-$5,476	-$13,167	46,594	27,025	$5,159.4	($1,013.4)	$4,146.0	$1,890.8	$303.7	($1,357.5)	$4,983.0	($8,184.0)
2012	-$7,957	-$5,769	-$13,726	50,719	28,947	$5,784.5	($1,117.4)	$4,667.1	$1,945.3	$306.2	($1,453.6)	$5,465.0	($8,261.0)
2013	-$8,169	-$6,469	-$14,638	54,566	30,712	$6,321.5	($1,185.5)	$5,136.0	$2,000.4	$308.7	($1,541.8)	$5,903.3	($8,734.7)
2014	-$8,236	-$7,060	-$15,296	58,552	31,965	$6,871.1	($1,233.8)	$5,637.3	$2,050.6	$310.3	($1,603.0)	$6,395.2	($8,900.8)
2015	$11,451	-$7,379	$4,072	62,537	33,219	$7,611.4	($1,322.1)	$6,289.3	$2,101.3	$312.0	($1,664.3)	$7,038.3	$11,110.3
2016	$17,185	-$7,445	$9,740	66,706	34,567	$7,925.3	($1,375.8)	$6,549.5	$2,192.2	$313.7	($1,730.2)	$7,325.2	$17,065.2
2017	$17,361	-$11,334	$6,027	70,904	35,578	$8,601.4	($1,416.0)	$7,185.4	$2,282.9	$315.2	($1,780.8)	$8,002.7	$14,029.7
2018	$16,483	-$13,479	$3,004	75,292	36,684	$9,449.9	($1,504.0)	$7,945.9	$2,374.3	$316.7	($1,836.1)	$8,800.8	$11,804.8
2019	$15,700	-$14,214	$1,486	80,610	37,547	$10,335.0	($1,539.4)	$8,795.6	$2,463.4	$318.0	($1,876.6)	$9,700.4	$11,186.4
2020	$14,965	-$15,100	-$135	84,554	38,515	$11,060.5	($1,579.1)	$9,481.4	$2,553.1	$319.3	($1,922.4)	$10,431.4	$10,296.4
2021	$12,378	-$12,938	-$560	86,978	38,801	$11,729.9	($1,637.4)	$10,092.5	$2,638.7	$320.0	($1,937.8)	$11,113.4	$10,553.4
2022	-$13,740	-$13,785	-$27,525	90,693	39,663	$12,693.4	($1,673.8)	$11,019.6	$2,729.3	$321.3	($1,978.4)	$12,091.8	($15,433.2)
NPV ($000s)	**$10,662**	**($50,759)**	**($40,098)**					**$35,916**	**$14,203**	**$2,171**	**($9,929)**	**$42,360**	**$2,262**

Reference:
Col. R - See Workpaper H, Page 14, Col. D.
Col. S - See Workpaper H, Page. 14, Col. E.
Col. W - For 2003-2008, See Workpaper H, Page 12, Col. N. For 2009-2022, See Workpaper H, Page 13, Col. K.
Col. X - For 2003-2008, See Workpaper H, Page 12, Col. O. For 2009-2022, See Workpaper H, Page 13, Col. L.
Col. Y - For 2003-2008, See Workpaper H, Page 12, Col. L. For 2009-2022, See Workpaper H, Page 13, Col. I.

HECO CHP Avoided Cost
Unit Addition Timing

Year	Unit Addition Timing	
	Base Plan No Utility CHP	Alternate Plan With Utility CHP
2003		**Start Utility CHP Program**
2004		
2005		
2006		
2007		
2008		
2009	**Add Simple Cycle CT (107 MW)**	
2010		**Add Simple Cycle CT (107 MW)**
2011		
2012		
2013		
2014		
2015	**Add Simple Cycle CT (107 MW)**	
2016	**Conversion of 2 CT's to DTCC (105 MW)** **Add FBC Coal (180 MW)** Retire KPLP (-180 MW)	**Add Simple Cycle CT (107 MW)** **Add FBC Coal (180 MW)** Retire KPLP (-180 MW)
2017		
2018		
2019		
2020		
2021	**Add Simple Cycle CT (107 MW)**	**Conversion of 2 CT's to DTCC (105 MW)**
2022	Retire AES (-180 MW)	**Add Simple Cycle CT (107 MW)** Retire AES (-180 MW)

Notes:

1 Aug 2002 Sales and Peak Forecast for 2003-2022
2 DSM & Load Mgmt LFA files from Energy Services Dept
3 CHP non-utility impacts from Energy Services LFA 7/28/03
Base Case assumes no utility CHP program
Alternate case includes utility CHP program
4 Utility CHP MW impacts from Energy Services LFA 8/4/03
Utility & non-utility CHP fcst: pdgfcst rev 8-20-03.xls
5 July 2002 Fuel Price Forecast
6 Utility CHP life = 20 years
7 AFBC unit timing fixed

HAWAII ELECTRIC LIGHT COMPANY, INC.

Summary of Cost-Benefit Analysis of Utility CHP Program - With Keahole ST7

	Base Case - No Utility CHP Program			Alternate Case - With Utility CHP Program			System Benefits Due To Utility-CHP Program							
Year	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Change In System Capacity Cost Revenue Requirements ($000s)	Change In System Energy Cost Revenue Requirements ($000s)	Total Change In System Cost ($000s)	Total Incremental Revenues From Retained Load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(B)	(C)	(D = B + C)	(E)	(F)	(G = E + F)	(H = B - E)	(I = C - F)	(J = H + I)	(K)	(L)	(M)	(N)	[O = Σ(J:N)]
2003	$42,943	$88,052	$130,995	$42,943	$88,052	$130,995	$0	$0	$0	$0.0	$0.0	$0.0	$0.0	$0.0
2004	$44,528	$76,045	$120,573	$44,811	$76,209	$121,020	-$283	-$164	-$447	$308.1	$79.2	$13.1	($58.8)	($105.4)
2005	$39,286	$81,529	$120,815	$40,114	$82,146	$122,260	-$828	-$617	-$1,445	$1,219.3	$282.5	$41.9	($205.8)	($107.1)
2006	$39,877	$86,175	$126,052	$41,350	$87,127	$128,477	-$1,473	-$952	-$2,425	$2,001.5	$536.9	$75.9	($385.1)	($195.8)
2007	$40,521	$90,978	$131,499	$42,646	$92,233	$134,879	-$2,125	-$1,255	-$3,380	$2,650.3	$855.2	$119.9	($603.8)	($358.4)
2008	$41,112	$96,329	$137,441	$43,877	$97,965	$141,842	-$2,765	-$1,636	-$4,401	$3,220.6	$1,125.5	$155.5	($783.4)	($682.8)
2009	$41,839	$100,940	$142,779	$45,123	$103,086	$148,209	-$3,284	-$2,146	-$5,430	$4,335.5	$1,321.6	$180.0	($1,045.3)	($638.2)
2010	$42,513	$104,015	$146,528	$46,264	$106,578	$152,842	-$3,751	-$2,563	-$6,314	$5,048.1	$1,364.5	$182.9	($1,202.2)	($920.7)
2011	$43,208	$109,005	$152,213	$47,301	$111,982	$159,283	-$4,093	-$2,977	-$7,070	$5,991.7	$1,426.7	$185.1	($1,320.2)	($786.7)
2012	$43,919	$114,424	$158,343	$48,216	$117,915	$166,131	-$4,297	-$3,491	-$7,788	$7,088.8	$1,486.1	$186.9	($1,412.5)	($438.7)
2013	$54,380	$109,585	$163,965	$49,065	$125,406	$174,471	$5,315	-$15,821	-$10,506	$8,244.9	$1,544.2	$188.4	($1,481.8)	($2,010.3)
2014	$57,174	$115,749	$172,923	$49,883	$132,689	$182,572	$7,291	-$16,940	-$9,649	$9,439.9	$1,602.9	$189.9	($1,555.0)	$28.7
2015	$57,694	$123,678	$181,372	$61,168	$129,633	$190,801	-$3,474	-$5,955	-$9,429	$10,228.1	$1,662.3	$191.4	($1,628.1)	$1,024.7
2016	$68,014	$133,885	$201,899	$64,394	$141,830	$206,224	$3,620	-$7,945	-$4,325	$11,850.5	$1,722.3	$192.9	($1,705.9)	$7,734.8
2017	$70,661	$138,469	$209,130	$75,109	$146,684	$221,793	-$4,448	-$8,215	-$12,663	$13,015.1	$1,782.9	$194.4	($1,774.4)	$555.0
2018	$81,378	$148,377	$229,755	$77,980	$158,295	$236,275	$3,398	-$9,918	-$6,520	$14,916.7	$1,844.2	$195.9	($1,847.6)	$8,589.2
2019	$84,001	$158,744	$242,745	$78,410	$169,700	$248,110	$5,591	-$10,956	-$5,365	$16,465.5	$1,906.1	$197.4	($1,920.7)	$11,283.3
2020	$83,925	$168,952	$252,877	$89,935	$180,173	$270,108	-$6,010	-$11,221	-$17,231	$17,780.3	$1,968.6	$198.9	($1,999.3)	$717.5
2021	$96,652	$169,917	$266,569	$92,639	$192,740	$285,379	$4,013	-$22,823	-$18,810	$19,455.1	$2,027.6	$199.9	($2,043.4)	$829.2
2022	$99,500	$181,275	$280,775	$105,890	$195,493	$301,383	-$6,390	-$14,218	-$20,608	$20,098.5	$2,116.8	$201.4	($2,116.6)	($307.9)
NPV ($000s)							**($9,412)**	**($48,321)**	**($57,733)**	**$61,146**	**$10,811**	**$1,317**	**($9,791)**	**$5,749**

Reference:
Col. B - See Workpaper H, Page 18, Col. 9.
Col. C - See Workpaper H, Page 18, Col. 8.
Col. E - See Workpaper H, Page 19, Col. 9 + Workpaper H, Page 29, Col. 4.
Col. F - See Workpaper H, Page 19, Col. 8 + Page 30, Col. 7.
Col. K - See Exhibit H, Page 7, Col. V.
Col. L - For 2003-2008, See Workpaper H, Page 35, Col. N. For 2009-2022, See Workpaper H, Page 36, Col. K.
Col. M - For 2003-2008, See Workpaper H, Page 35, Col. O. For 2009-2022, See Workpaper H, Page 36, Col. L.
Col. N - For 2003-2008, See Workpaper H, Page 35, Col. L. For 2009-2022, See Workpaper H, Page 36, Col. I.

HAWAII ELECTRIC LIGHT COMPANY, INC.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 1 of 2)

	Base Case - No Utility CHP Program						Alternate Case - With Utility CHP Program						
Year	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Fixed Cost Embedded in Schedule P (¢/kWh)[1]	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Avg Energy Cost For Central Plant (¢/kWH)	Lost FC Rev From Avoided A/C Load (¢/kWh)[2]
(A)	(B)	(C)	(D)	(E = C + D)	(F = D + B)	(G)	(H = B + R - S)	(I)	(J)	(K = I + J)	(L = J + H)	(M)	(N)
2003	1,030,000	$42,943	$88,052	$130,995	8.55	7.617	1,030,000	$42,943	$88,052	$130,995	8.55	8.55	-6.20
2004	1,052,000	$44,528	$76,045	$120,573	7.23	7.617	1,053,622	$44,811	$76,209	$121,020	7.23	7.22	-6.20
2005	1,075,000	$39,286	$81,529	$120,815	7.58	7.617	1,081,454	$40,114	$82,146	$122,260	7.60	7.57	-6.20
2006	1,097,000	$39,877	$86,175	$126,052	7.86	7.846	1,106,905	$41,350	$87,127	$128,477	7.87	7.82	-6.39
2007	1,122,000	$40,521	$90,978	$131,499	8.11	7.846	1,134,217	$42,646	$92,233	$134,879	8.13	8.05	-6.39
2008	1,148,000	$41,112	$96,329	$137,441	8.39	7.846	1,162,123	$43,877	$97,965	$141,842	8.43	8.32	-6.39
2009	1,163,000	$41,839	$100,940	$142,779	8.68	8.081	1,181,259	$45,123	$103,086	$148,209	8.73	8.58	-6.58
2010	1,180,000	$42,513	$104,015	$146,528	8.81	8.081	1,201,051	$46,264	$106,578	$152,842	8.87	8.71	-6.58
2011	1,201,000	$43,208	$109,005	$152,213	9.08	8.081	1,226,157	$47,301	$111,982	$159,283	9.13	8.96	-6.58
2012	1,226,000	$43,919	$114,424	$158,343	9.33	8.323	1,255,759	$48,216	$117,915	$166,131	9.39	9.21	-6.78
2013	1,250,000	$54,380	$109,585	$163,965	8.77	8.323	1,284,646	$49,065	$125,406	$174,471	9.76	9.58	-6.78
2014	1,275,000	$57,174	$115,749	$172,923	9.08	8.323	1,314,671	$49,883	$132,689	$182,572	10.09	9.90	-6.78
2015	1,304,000	$57,694	$123,678	$181,372	9.48	8.573	1,348,686	$61,168	$129,633	$190,801	9.61	9.35	-6.98
2016	1,336,000	$68,014	$133,885	$201,899	10.02	8.573	1,386,705	$64,394	$141,830	$206,224	10.23	9.96	-6.98
2017	1,362,000	$70,661	$138,469	$209,130	10.17	8.573	1,417,927	$75,109	$146,684	$221,793	10.34	10.07	-6.98
2018	1,390,000	$81,378	$148,377	$229,755	10.67	8.830	1,452,142	$77,980	$158,295	$236,275	10.90	10.61	-7.19
2019	1,421,000	$84,001	$158,744	$242,745	11.17	8.830	1,488,158	$78,410	$169,700	$248,110	11.40	11.11	-7.19
2020	1,455,000	$83,925	$168,952	$252,877	11.61	8.830	1,526,254	$89,935	$180,173	$270,108	11.80	11.50	-7.19
2021	1,490,000	$96,652	$169,917	$266,569	11.40	9.095	1,565,579	$92,639	$192,740	$285,379	12.31	12.00	-7.41
2022	1,526,000	$99,500	$181,275	$280,775	11.88	9.095	1,605,009	$105,890	$195,493	$301,383	12.18	11.80	-7.41
NPV ($000s)				$1,630,550						$1,688,283			

Reference:
Col. B - See Workpaper H, Page 18, Col. 1 x 1000 x (1 - .0868). Assumes T&D loss factor of 8.68%.
Col. C - See Workpaper H, Page 18, Col. 9.
Col. D - See Workpaper H, Page 18, Col. 8.
Col. I - See Workpaper H, Page 19, Col. 9 + Page 29, Col. 4.
Col. J - See Workpaper H, Page 19, Col. 8 + Page 30, Col. 7.
Col. M - For 2003-2008, See Workpaper H, Page 19, Col. 8 + (Col. H - Workpaper H, Page 35, Col. K).
For 2009-2022, See Workpaper H, Page 19, Col. 8 + (Col. H - Workpaper H, Page 36, Co. G).

[1] FC embedded in Schedule P base rates effective February 15, 2001 is 7.617 ¢/kWh. Escalated by 3% every 3 years to approximate rate increase impact.
[2] Based on rate analysis for 5 target Utility-CHP customers.

HAWAII ELECTRIC LIGHT COMPANY, INC.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 2 of 2)

	Change in System Costs			Estimated Incremental Revenues From Utility-CHP Program									
Year	Change in System Capacity Cost Revenue Requirements ($000s)	Change in System Energy Cost Revenue Requirements ($000s)	Total Change in System Cost ($000s)	Retained Sales (MWH)	Avoided A/C Load (MWH)	Total Retained Revenues From Retained Sales ($000/Yr)	Lost FC Revenues From Avoided A/C Load ($000/Yr)	Net Retained Revenues From Retained load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Total Incremental Revenues From the Utility-CHP Program ($000/Yr)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(O = C - I)	(P = D - J)	(Q = O + P)	(R)	(S)	[T = (G+M) x R]	(U = N x S)	(V = T + U)	(W)	(X)	(Y)	[Z = Σ(V:Y)]	(AA = Q + Z)
2003	$0	$0	$0	0	0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
2004	-$283	-$164	-$447	2,403	781	$356.5	($48.4)	$308.1	$79.2	$13.1	($58.8)	$341.6	($105.4)
2005	-$828	-$617	-$1,445	9,115	2,661	$1,384.3	($165.0)	$1,219.3	$282.5	$41.9	($205.8)	$1,337.9	($107.1)
2006	-$1,473	-$952	-$2,425	14,754	4,849	$2,311.4	($309.9)	$2,001.5	$536.9	$75.9	($385.1)	$2,229.2	($195.8)
2007	-$2,125	-$1,255	-$3,380	19,668	7,451	$3,126.4	($476.1)	$2,650.3	$855.2	$119.9	($603.8)	$3,021.6	($358.4)
2008	-$2,765	-$1,636	-$4,401	23,712	9,589	$3,833.3	($612.7)	$3,220.6	$1,125.5	$155.5	($783.4)	$3,718.2	($682.8)
2009	-$3,284	-$2,146	-$5,430	31,089	12,830	$5,179.7	($844.2)	$4,335.5	$1,321.6	$180.0	($1,045.3)	$4,791.8	($638.2)
2010	-$3,751	-$2,563	-$6,314	35,872	14,821	$6,023.3	($975.2)	$5,048.1	$1,364.5	$182.9	($1,202.2)	$5,393.3	($920.7)
2011	-$4,093	-$2,977	-$7,070	41,453	16,296	$7,064.0	($1,072.3)	$5,991.7	$1,426.7	$185.1	($1,320.2)	$6,283.3	($786.7)
2012	-$4,297	-$3,491	-$7,788	47,161	17,402	$8,268.7	($1,179.9)	$7,088.8	$1,486.1	$186.9	($1,412.5)	$7,349.3	($438.7)
2013	$5,315	-$15,821	-$10,506	53,007	18,361	$9,489.8	($1,244.9)	$8,244.9	$1,544.2	$188.4	($1,481.8)	$8,495.7	($2,010.3)
2014	$7,291	-$16,940	-$9,649	58,990	19,319	$10,749.7	($1,309.8)	$9,439.9	$1,602.9	$189.9	($1,555.0)	$9,677.7	$28.7
2015	-$3,474	-$5,955	-$9,429	64,964	20,278	$11,643.5	($1,415.4)	$10,228.1	$1,662.3	$191.4	($1,628.1)	$10,453.7	$1,024.7
2016	$3,620	-$7,945	-$4,325	71,941	21,236	$13,332.8	($1,482.3)	$11,850.5	$1,722.3	$192.9	($1,705.9)	$12,059.8	$7,734.8
2017	-$4,448	-$8,215	-$12,663	78,122	22,195	$14,564.3	($1,549.2)	$13,015.1	$1,782.9	$194.4	($1,774.4)	$13,218.0	$555.0
2018	$3,398	-$9,918	-$6,520	85,296	23,154	$16,581.5	($1,664.8)	$14,916.7	$1,844.2	$195.9	($1,847.6)	$15,109.2	$8,589.2
2019	$5,591	-$10,956	-$5,365	91,270	24,112	$18,199.2	($1,733.7)	$16,465.5	$1,906.1	$197.4	($1,920.7)	$16,648.3	$11,283.3
2020	-$6,010	-$11,221	-$17,231	96,325	25,071	$19,582.9	($1,802.6)	$17,780.3	$1,968.6	$198.9	($1,999.3)	$17,948.5	$717.5
2021	$4,013	-$22,823	-$18,810	101,240	25,661	$21,356.6	($1,901.5)	$19,455.1	$2,027.6	$199.9	($2,043.4)	$19,639.2	$829.2
2022	-$6,390	-$14,218	-$20,608	105,628	26,619	$22,071.0	($1,972.5)	$20,098.5	$2,116.8	$201.4	($2,116.6)	$20,300.1	($307.9)
NPV ($000s)	**($9,412)**	**($48,321)**	**($57,733)**					**$61,146**	**$10,811**	**$1,317**	**($9,791)**	**$63,482**	**$5,749**

Reference:
Col. R - See Workpaper H, Page 37, Col. D.
Col. S - See Workpaper H, Page 37, Col. E.
Col. W - For 2003-2008, See Workpaper H, Page 35, Col. N. For 2009-2022, See Workpaper H, Page 36, Col. K.
Col. X - For 2003-2008, See Workpaper H, Page 35, Col. O. For 2009-2022, See Workpaper H, Page 36, Col. L.
Col. Y - For 2003-2008, See Workpaper H, Page 35, Col. L. For 2009-2022, See Workpaper H, Page 36, Col. I.

HELCO CHP Avoided Cost
Unit Addition Timing with ST-7

Year	Unit Addition Timing	
	Base Plan No Utility CHP	Alternate Plan with Utility CHP
2003		
2004	**Add Keahole CT4/5** Retire Keahole D18-20 Terminate HCPC	**Start Utility CHP Program** **Add Keahole CT4/5** Retire Keahole D18-20 Terminate HCPC
2005		
2006		
2007		
2008		
2009		
2010		
2011		
2012		
2013	**Add Keahole ST7 (Keahole DTCC complete)**	
2014		
2015		**Add Keahole ST7 (Keahole DTCC complete)**
2016	**Add West Hi 1st CT**	
2017		**Add West Hi 1st CT**
2018	**Add West Hi 2nd CT**	
2019		
2020		**Addt West Hi 2nd CT**
2021	**Convert West Hi CTs to DTCC**	
2022		**Convert West Hi CTs to DTCC**

Notes:

1 May 2003 Sales and Peak Forecast for 2003-2008
Sept 1997 Sales and Peak Forecast % incr for 2009-2022
2 Acquired DSM 1996-2002 from Energy Services Dept LFA files 3/28/03
Future DSM from Energy Services Dept LFA files 3/28/03
3 CHP projected impacts from Forecasting Division hdgfcst 8-20-03.xls
4 CHP non-utility impacts from Energy Services Dept LFA files 7/28/03
Base Case assumes no utility CHP program
Alternate case includes utility CHP program
5 Utility CHP MW impacts from Energy Services Dept LFA files 8/13/03
6 July 2002 Fuel Price Forecast
7 Utility CHP life = 20 years
8 Discount rate **8.42%**
9 Keahole ST7 included in resource plan

HAWAII ELECTRIC LIGHT COMPANY, INC.

Summary of Cost-Benefit Analysis of Utility CHP Program - Without Keahole ST7

	Base Case - No Utility CHP Program			Alternate Case - With Utility CHP Program			System Benefits Due To Utility-CHP Program							
Year	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Change In System Capacity Cost Revenue Requirements ($000s)	Change In System Energy Cost Revenue Requirements ($000s)	Total Change In System Cost ($000s)	Total Incremental Revenues From Retained load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(B)	(C)	(D = B + C)	(E)	(F)	(G = E + F)	(H = B - E)	(I = C - F)	(J = H + I)	(K)	(L)	(M)	(N)	[O = Σ(J:N)]
2003	$42,943	$88,052	$130,995	$42,943	$88,052	$130,995	$0	$0	$0	$0.0	$0.0	$0.0	$0.0	$0.0
2004	$44,528	$76,045	$120,573	$44,811	$76,209	$121,020	-$283	-$164	-$447	$308.1	$79.2	$12.3	($58.8)	($106.2)
2005	$39,286	$81,529	$120,815	$40,114	$82,146	$122,260	-$828	-$617	-$1,445	$1,219.3	$282.5	$33.2	($205.8)	($115.8)
2006	$39,877	$86,175	$126,052	$41,350	$87,127	$128,477	-$1,473	-$952	-$2,425	$2,001.5	$536.9	$67.2	($385.1)	($204.5)
2007	$40,521	$90,978	$131,499	$42,646	$92,233	$134,879	-$2,125	-$1,255	-$3,380	$2,650.3	$855.2	$111.2	($603.8)	($367.1)
2008	$41,112	$96,329	$137,441	$43,877	$97,965	$141,842	-$2,765	-$1,636	-$4,401	$3,220.6	$1,125.5	$146.8	($783.4)	($691.5)
2009	$41,839	$100,940	$142,779	$45,123	$103,086	$148,209	-$3,284	-$2,146	-$5,430	$4,335.5	$1,321.6	$171.3	($1,045.3)	($646.9)
2010	$42,513	$104,015	$146,528	$46,264	$106,578	$152,842	-$3,751	-$2,563	-$6,314	$5,048.1	$1,364.5	$174.2	($1,202.2)	($929.4)
2011	$43,208	$109,005	$152,213	$47,301	$111,982	$159,283	-$4,093	-$2,977	-$7,070	$5,991.7	$1,426.7	$176.4	($1,320.2)	($795.4)
2012	$43,919	$114,424	$158,343	$48,216	$117,915	$166,131	-$4,297	-$3,491	-$7,788	$7,088.8	$1,486.1	$178.2	($1,412.5)	($447.4)
2013	$53,493	$119,657	$173,150	$49,065	$125,406	$174,471	$4,428	-$5,749	-$1,321	$8,244.9	$1,544.2	$179.7	($1,481.8)	$7,166.0
2014	$56,122	$126,008	$182,130	$49,883	$132,689	$182,572	$6,239	-$6,681	-$442	$9,439.9	$1,602.9	$181.2	($1,555.0)	$9,227.0
2015	$56,601	$134,412	$191,013	$60,225	$141,130	$201,355	-$3,624	-$6,718	-$10,342	$10,819.3	$1,662.3	$182.7	($1,628.1)	$694.2
2016	$77,665	$130,687	$208,352	$63,272	$154,004	$217,276	$14,393	-$23,317	-$8,924	$12,519.6	$1,722.3	$184.2	($1,705.9)	$3,796.2
2017	$82,557	$135,821	$218,378	$85,094	$144,614	$229,708	-$2,537	-$8,793	-$11,330	$12,882.3	$1,782.9	$185.7	($1,774.4)	$1,746.5
2018	$82,421	$146,009	$228,430	$90,295	$156,743	$247,038	-$7,874	-$10,734	-$18,608	$14,805.9	$1,844.2	$187.2	($1,847.6)	($3,618.3)
2019	$82,427	$156,207	$238,634	$90,302	$168,003	$258,305	-$7,875	-$11,796	-$19,671	$16,328.6	$1,906.1	$188.7	($1,920.7)	($3,168.3)
2020	$82,379	$166,338	$248,717	$90,273	$178,835	$269,108	-$7,894	-$12,497	-$20,391	$17,664.7	$1,968.6	$190.2	($1,999.3)	($2,566.8)
2021	$94,004	$177,366	$271,370	$90,218	$191,311	$281,529	$3,786	-$13,945	-$10,159	$19,333.6	$2,027.6	$191.2	($2,043.4)	$9,350.0
2022	$96,615	$189,345	$285,960	$102,294	$203,975	$306,269	-$5,679	-$14,630	-$20,309	$20,690.0	$2,116.8	$192.7	($2,116.6)	$573.9
NPV ($000s)							**($13,337)**	**($44,280)**	**($57,617)**	**$61,560**	**$10,811**	**$1,243**	**($9,791)**	**$6,206**

Reference:
Col. B - See Workpaper H, Page 33, Col. 9.
Col. C - See Workpaper H, Page 33, Col. 8.
Col. E - See Workpaper H, Page 34, Col. 9 + Workpaper H, Page 29, Col. 4.
Col. F - See Workpaper H, Page 34, Col. 8 + workpaper H, Page 30, Col. 7.
Col. K - See Exhibit H, Page 11, Col. V.
Col. L - For 2003-2008, See Workpaper H, Page 35, Col. N. For 2009-2022, See Workpaper H, Page 36, Col. K.
Col. M - For 2003-2008, See Workpaper H, Page 35, Col. O. For 2009-2022, See Workpaper H, Page 36, Col. L.
Col. N - For 2003-2008, See Workpaper H, Page 35, Col. L. For 2009-2022, See Workpaper H, Page 36, Col. I.

HAWAII ELECTRIC LIGHT COMPANY, INC.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 1 of 2)

	Base Case - No Utility CHP Program						Alternate Case - With Utility CHP Program						
Year	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Fixed Cost Embedded in Schedule P (¢/kWh)[1]	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Avg Energy Cost For Central Plant (¢/kWH)	Lost FC Rev From Avoided A/C Load (¢/kWh)[1/2]
(A)	(B)	(C)	(D)	(E = C + D)	(F = D ÷ B)	(G)	(H = B + R - S)	(I)	(J)	(K = I + J)	(L = J ÷ H)	(M)	(N)
2003	1,030,000	$42,943	$88,052	$130,995	8.55	7.617	1,030,000	$42,943	$88,052	$130,995	8.55	8.55	-6.20
2004	1,052,000	$44,528	$76,045	$120,573	7.23	7.617	1,053,622	$44,811	$76,209	$121,020	7.23	7.22	-6.20
2005	1,075,000	$39,286	$81,529	$120,815	7.58	7.617	1,081,454	$40,114	$82,146	$122,260	7.60	7.57	-6.20
2006	1,097,000	$39,877	$86,175	$126,052	7.86	7.846	1,106,905	$41,350	$87,127	$128,477	7.87	7.82	-6.39
2007	1,122,000	$40,521	$90,978	$131,499	8.11	7.846	1,134,217	$42,646	$92,233	$134,879	8.13	8.05	-6.39
2008	1,148,000	$41,112	$96,329	$137,441	8.39	7.846	1,162,123	$43,877	$97,965	$141,842	8.43	8.32	-6.39
2009	1,163,000	$41,839	$100,940	$142,779	8.68	8.081	1,181,259	$45,123	$103,086	$148,209	8.73	8.58	-6.58
2010	1,180,000	$42,513	$104,015	$146,528	8.81	8.081	1,201,051	$46,264	$106,578	$152,842	8.87	8.71	-6.58
2011	1,201,000	$43,208	$109,005	$152,213	9.08	8.081	1,226,157	$47,301	$111,982	$159,283	9.13	8.96	-6.58
2012	1,226,000	$43,919	$114,424	$158,343	9.33	8.323	1,255,759	$48,216	$117,915	$166,131	9.39	9.21	-6.78
2013	1,250,000	$53,493	$119,657	$173,150	9.57	8.323	1,284,646	$49,065	$125,406	$174,471	9.76	9.58	-6.78
2014	1,275,000	$56,122	$126,008	$182,130	9.88	8.323	1,314,671	$49,883	$132,689	$182,572	10.09	9.90	-6.78
2015	1,304,000	$56,601	$134,412	$191,013	10.31	8.573	1,348,686	$60,225	$141,130	$201,355	10.46	10.26	-6.98
2016	1,336,000	$77,665	$130,687	$208,352	9.78	8.573	1,386,705	$63,272	$154,004	$217,276	11.11	10.89	-6.98
2017	1,362,000	$82,557	$135,821	$218,378	9.97	8.573	1,417,927	$85,094	$144,614	$229,708	10.20	9.90	-6.98
2018	1,390,000	$82,421	$146,009	$228,430	10.50	8.830	1,452,142	$90,295	$156,743	$247,038	10.79	10.48	-7.19
2019	1,421,000	$82,427	$156,207	$238,634	10.99	8.830	1,488,158	$90,302	$168,003	$258,305	11.29	10.96	-7.19
2020	1,455,000	$82,379	$166,338	$248,717	11.43	8.830	1,526,254	$90,273	$178,835	$269,108	11.72	11.38	-7.19
2021	1,490,000	$94,004	$177,366	$271,370	11.90	9.095	1,565,579	$90,218	$191,311	$281,529	12.22	11.88	-7.41
2022	1,526,000	$96,615	$189,345	$285,960	12.41	9.095	1,605,009	$102,294	$203,975	$306,269	12.71	12.36	-7.41
NPV ($000s)				$1,646,981						$1,704,598			

Reference:
Col. B - See Workpaper H, Page 18, Col. 1 x 1000 x (1-.0868). Assumes T&D loss factor of 8.68%.
Col. C - See Workpaper H, Page 33, Col. 9.
Col. D - See Workpaper H, Page 33, Col. 8.
Col. I - See Workpaper H, Page 34, Col. 9 + Workpaper H, Page 29, Col. 4.
Col. J - See Workpaper H, Page 34, Col. 8 + Workpaper H, Page 30, Col. 7.
Col. M - For 2003-2008, See Workpaper H, Page 34, Col. 8 + (Col. H - Workpaper H, Page 35, Col. K)
For 2009-2022, See Workpaper H, Page 34, Col. 8 + (Col. H - Workpaper H, Page 36, Col. G).

[1] FC embedded in Schedule P base rates effective February 15, 2001 is 7.617 ¢/kWh. Escalated by 3% every 3 years to approximate rate increase impact.
[2] Based on rate analysis for 5 target Utility-CHP customers, and escalated by 3% every 3 years.

HAWAII ELECTRIC LIGHT COMPANY, INC.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 2 of 2)

	Change in System Costs			Estimated Incremental Revenues From Utility-CHP Program									
Year	Change in System Capacity Cost Revenue Requirements ($000s)	Change in System Energy Cost Revenue Requirements ($000s)	Total Change in System Cost ($000s)	Retained Sales (MWH)	Avoided A/C Load (MWH)	Total Retained Revenues From Retained Sales ($000/Yr)	Lost FC Revenues From Avoided A/C Load ($000/Yr)	Net Retained Revenues From Retained load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Total Incremental Revenues From the Utility-CHP Program ($000/Yr)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(O = C - I)	(P = D - J)	(Q = O + P)	(R)	(S)	[T = (G+M) x R]	(U = N x S)	(V = T + U)	(W)	(X)	(Y)	[Z = Σ(V:Y)]	(AA = Q + Z)
2003	$0	$0	$0	0	0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
2004	-$283	-$164	-$447	2,403	781	$356.5	($48.4)	$308.1	$79.2	$12.3	($58.8)	$340.8	($106.2)
2005	-$828	-$617	-$1,445	9,115	2,661	$1,384.3	($165.0)	$1,219.3	$282.5	$33.2	($205.8)	$1,329.2	($115.8)
2006	-$1,473	-$952	-$2,425	14,754	4,849	$2,311.4	($309.9)	$2,001.5	$536.9	$67.2	($385.1)	$2,220.5	($204.5)
2007	-$2,125	-$1,255	-$3,380	19,668	7,451	$3,126.4	($476.1)	$2,650.3	$855.2	$111.2	($603.8)	$3,012.9	($367.1)
2008	-$2,765	-$1,636	-$4,401	23,712	9,589	$3,833.3	($612.7)	$3,220.6	$1,125.5	$146.8	($783.4)	$3,709.5	($691.5)
2009	-$3,284	-$2,146	-$5,430	31,089	12,830	$5,179.7	($844.2)	$4,335.5	$1,321.6	$171.3	($1,045.3)	$4,783.1	($646.9)
2010	-$3,751	-$2,563	-$6,314	35,872	14,821	$6,023.3	($975.2)	$5,048.1	$1,364.5	$174.2	($1,202.2)	$5,384.6	($929.4)
2011	-$4,093	-$2,977	-$7,070	41,453	16,296	$7,064.0	($1,072.3)	$5,991.7	$1,426.7	$176.4	($1,320.2)	$6,274.6	($795.4)
2012	-$4,297	-$3,491	-$7,788	47,161	17,402	$8,268.7	($1,179.9)	$7,088.8	$1,486.1	$178.2	($1,412.5)	$7,340.6	($447.4)
2013	$4,428	-$5,749	-$1,321	53,007	18,361	$9,489.8	($1,244.9)	$8,244.9	$1,544.2	$179.7	($1,481.8)	$8,487.0	$7,166.0
2014	$6,239	-$6,681	-$442	58,990	19,319	$10,749.7	($1,309.8)	$9,439.9	$1,602.9	$181.2	($1,555.0)	$9,669.0	$9,227.0
2015	-$3,624	-$6,718	-$10,342	64,964	20,278	$12,234.7	($1,415.4)	$10,819.3	$1,662.3	$182.7	($1,628.1)	$11,036.2	$694.2
2016	$14,393	-$23,317	-$8,924	71,941	21,236	$14,001.9	($1,482.3)	$12,519.6	$1,722.3	$184.2	($1,705.9)	$12,720.2	$3,796.2
2017	-$2,537	-$8,793	-$11,330	78,122	22,195	$14,431.5	($1,549.2)	$12,882.3	$1,782.9	$185.7	($1,774.4)	$13,076.5	$1,746.5
2018	-$7,874	-$10,734	-$18,608	85,296	23,154	$16,470.7	($1,664.8)	$14,805.9	$1,844.2	$187.2	($1,847.6)	$14,989.7	($3,618.3)
2019	-$7,875	-$11,796	-$19,671	91,270	24,112	$18,062.3	($1,733.7)	$16,328.6	$1,906.1	$188.7	($1,920.7)	$16,502.7	($3,168.3)
2020	-$7,894	-$12,497	-$20,391	96,325	25,071	$19,467.3	($1,802.6)	$17,664.7	$1,968.6	$190.2	($1,999.3)	$17,824.2	($2,566.8)
2021	$3,786	-$13,945	-$10,159	101,240	25,661	$21,235.1	($1,901.5)	$19,333.6	$2,027.6	$191.2	($2,043.4)	$19,509.0	$9,350.0
2022	-$5,679	-$14,630	-$20,309	105,628	26,619	$22,662.5	($1,972.5)	$20,690.0	$2,116.8	$192.7	($2,116.6)	$20,882.9	$573.9
NPV ($000s)	**($13,337)**	**($44,280)**	**($57,617)**					**$61,560**	**$10,811**	**$1,243**	**($9,791)**	**$63,823**	**$6,206**

Reference:
Col. R - See Workpaper H, Page 37, Col. D.
Col. S - See Workpaper H, Page 37, Col. E.
Col. W - For 2003-2008, See Workpaper H, Page 35, Col. N. For 2009-2022, See Wokpaper H, Page 36, Col. K.
Col. X - For 2003-2008, See Workpaper H, Page 35, Col. O. For 2009-2022, See Workpaper H, Page 36, Col. L.
Col. Y - For 2003-2008, See Workpaper H, Page 35, Col. L. For 2009-2022, See Workpaper H, Page 36, Col. I.

HELCO CHP Avoided Cost
Unit Addition Timing without ST-7

Year	Unit Addition Timing	
	Base Plan No Utility CHP	Alternate Plan with Utility CHP
2003		
2004	**Add Keahole CT4/5** Retire Keahole D18-20 Terminate HCPC	**Start Utility CHP Program** **Add Keahole CT4/5** Retire Keahole D18-20 Terminate HCPC
2005		
2006		
2007		
2008		
2009		
2010		
2011		
2012		
2013	**Add West Hi 1st CT**	
2014		
2015		**Add West Hi 1st CT**
2016	**Add West Hi 2nd CT** **Convert West Hi CTs to DTCC**	
2017		**Add West Hi 2nd CT** **Convert West Hi CTs to DTCC**
2018		
2019		
2020		
2021	**Add West Hi 3rd CT**	
2022		**Add West Hi 3rd CT**

Notes:

1 May 2003 Sales and Peak Forecast for 2003-2008
Sept 1997 Sales and Peak Forecast % incr for 2009-2022
2 Acquired DSM 1996-2002 from Energy Services Dept LFA files
Future DSM from Energy Services Dept LFA files
3 CHP projected impacts from Forecasting Division hdgfcst 8-20-03.xls
4 CHP non-utility impacts from Energy Services Dept LFA files 7/28/03
Base Case assumes no utility CHP program
Alternate case includes utility CHP program
5 Utility CHP MW impacts from Energy Services Dept LFA files 8/13/03
6 July 2002 Fuel Price Forecast
7 Utility CHP life = 20 years
8 Discount rate 8.42%
9 Keahole ST7 not included in resource plan

MAUI ELECTRIC COMPANY, LTD.

Summary of Cost-Benefit Analysis of Utility CHP Program

	Base Case - No Utility CHP Program			Alternate Case - With Utility CHP Program			System Benefits Due To Utility-CHP Program							
Year	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Change In System Capacity Cost Revenue Requirements ($000s)	Change In System Energy Cost Revenue Requirements ($000s)	Total Change In System Cost ($000s)	Total Incremental Revenues From Retained load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(B)	(C)	(D = B + C)	(E)	(F)	(G = E + F)	(H = B - E)	(I = C - F)	(J = H + I)	(K)	(L)	(M)	(N)	[O = ∑(J:N)]
2003	$20,676	$76,400	$97,076	$20,910	$76,454	$97,364	-$234	-$54	-$288	$94.5	$9.5	$1.3	($7.8)	($190.5)
2004	$21,449	$82,630	$104,079	$22,354	$83,186	$105,540	-$905	-$556	-$1,461	$974.6	$248.6	$37.1	($193.4)	($394.1)
2005	$22,986	$84,814	$107,800	$24,825	$85,877	$110,702	-$1,839	-$1,063	-$2,902	$1,796.0	$609.3	$95.2	($463.9)	($865.4)
2006	$30,025	$83,144	$113,169	$32,960	$85,020	$117,980	-$2,935	-$1,876	-$4,811	$2,328.5	$1,015.9	$158.2	($758.2)	($2,066.6)
2007	$31,405	$86,886	$118,291	$35,179	$89,426	$124,605	-$3,774	-$2,540	-$6,314	$3,113.0	$1,430.1	$222.3	($1,044.1)	($2,592.7)
2008	$39,072	$92,875	$131,947	$32,630	$95,833	$128,463	$6,442	-$2,958	$3,484	$3,957.5	$1,659.4	$256.9	($1,189.1)	$8,168.7
2009	$40,666	$97,679	$138,345	$32,193	$101,595	$133,788	$8,473	-$3,916	$4,557	$5,594.0	$1,779.8	$272.7	($1,331.7)	$10,871.8
2010	$40,255	$100,937	$141,192	$43,584	$105,433	$149,017	-$3,329	-$4,496	-$7,825	$6,524.7	$1,823.0	$274.7	($1,404.7)	($607.3)
2011	$39,776	$106,062	$145,838	$46,014	$111,095	$157,109	-$6,238	-$5,033	-$11,271	$7,405.7	$1,866.5	$276.2	($1,477.7)	($3,200.3)
2012	$47,739	$111,475	$159,214	$45,825	$117,005	$162,830	$1,914	-$5,530	-$3,616	$8,374.2	$1,910.4	$277.7	($1,554.9)	$5,391.4
2013	$49,240	$119,246	$168,486	$54,035	$125,018	$179,053	-$4,795	-$5,772	-$10,567	$8,760.7	$1,951.0	$278.7	($1,597.2)	($1,173.8)
2014	$48,753	$126,856	$175,609	$55,600	$132,905	$188,505	-$6,847	-$6,049	-$12,896	$9,262.6	$2,029.9	$280.2	($1,665.7)	($2,989.0)
2015	$58,626	$131,895	$190,521	$55,137	$144,219	$199,356	$3,489	-$12,324	-$8,835	$9,888.0	$2,109.4	$281.7	($1,734.3)	$1,709.8
2016	$60,536	$143,248	$203,784	$65,500	$151,045	$216,545	-$4,964	-$7,797	-$12,761	$10,367.7	$2,189.6	$283.2	($1,807.8)	($1,728.3)
2017	$69,343	$148,053	$217,396	$67,423	$155,765	$223,188	$1,920	-$7,712	-$5,792	$10,332.9	$2,267.0	$284.2	($1,849.3)	$5,242.8
2018	$70,670	$161,097	$231,767	$76,541	$169,362	$245,903	-$5,871	-$8,265	-$14,136	$11,111.5	$2,348.3	$285.7	($1,917.9)	($2,308.4)
2019	$79,702	$173,780	$253,482	$77,968	$182,351	$260,319	$1,734	-$8,571	-$6,837	$11,657.7	$2,430.3	$287.2	($1,986.5)	$5,551.7
2020	$80,899	$186,096	$266,995	$87,305	$195,020	$282,325	-$6,406	-$8,924	-$15,330	$12,087.1	$2,509.1	$288.2	($2,038.5)	($2,484.1)
2021	$91,921	$194,409	$286,330	$88,552	$209,228	$297,780	$3,369	-$14,819	-$11,450	$12,520.3	$2,592.3	$289.7	($2,101.5)	$1,850.8
2022	$93,349	$208,586	$301,935	$87,194	$224,478	$311,672	$6,155	-$15,892	-$9,737	$12,760.2	$2,672.1	$290.7	($2,148.0)	$3,838.0
NPV ($000s)									**($53,823)**	**$57,959**	**$14,908**	**$2,079**	**($11,733)**	**$9,390**

Reference:
Col. B - See Workpaper H, Page 41, Col. 9.
Col. C - See Workpaper H, Page 41, Col. 8.
Col. E - See Workpaper H, Page 42, Col. 9 + Workpaper H, Page 50, Col. 4.
Col. F - See Workpaper H, Page 42, Col. 8 + Workpaper H, Page 51, Col. 4 + Workpaper H, Page 51, Col. 6.
Col. K - See Exhibit H, Page 15, Col. V.
Col. L - For 2003-2008, See Workpaper H, Page 52, Col. N. For 2009-2022, See Workpaper H, Page 53, Col. K.
Col. M - For 2003-2008, See Workpaper H, Page 52, Col. O. For 2009-2022, See Workpaper H, Page 53, Col. L.
Col. N - For 2003-2008, See Workpaper H, Page 52, Col. L. For 2009-2022, See Workpaper H, Page 53, Col. I.

MAUI ELECTRIC COMPANY, LTD.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 1 of 2)

	Base Case - No Utility CHP Program						Alternate Case - With Utility CHP Program						
Year	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Fixed Cost Embedded in Schedule P (¢/kWh)[1]	Total System Sales (MWH)	Total Capacity Cost Revenue Requirements ($000s)	Total Energy Cost Revenue Requirements ($000s)	Total Cost ($000s)	Average Energy Cost (¢/kWh)	Avg Energy Cost For Central Plant (¢/kWH)	Lost FC Rev From Avoided A/C Load (¢/kWh)[1/2]
(A)	(B)	(C)	(D)	(E = C + D)	(F = D ÷ B)	(G)	(H = B + R - S)	(I)	(J)	(K = I + J)	(L = J ÷ H)	(M)	(N)
2003	1,129,000	$20,676	$76,400	$97,076	6.77	6.779	1,129,631	$20,910	$76,454	$97,364	6.77	6.77	-5.10
2004	1,155,000	$21,449	$82,630	$104,079	7.15	6.779	1,160,384	$22,354	$83,186	$105,540	7.17	7.15	-5.10
2005	1,169,000	$22,986	$84,814	$107,800	7.26	6.779	1,178,019	$24,825	$85,877	$110,702	7.29	7.23	-5.10
2006	1,187,000	$30,025	$83,144	$113,169	7.00	6.982	1,197,600	$32,960	$85,020	$117,980	7.10	6.99	-5.25
2007	1,208,000	$31,405	$86,886	$118,291	7.19	6.982	1,221,516	$35,179	$89,426	$124,605	7.32	7.16	-5.25
2008	1,231,000	$39,072	$92,875	$131,947	7.54	6.982	1,248,443	$32,630	$95,833	$128,463	7.68	7.50	-5.25
2009	1,255,000	$40,666	$97,679	$138,345	7.78	7.191	1,281,398	$32,193	$101,595	$133,788	7.93	7.73	-5.41
2010	1,286,000	$40,255	$100,937	$141,192	7.85	7.191	1,317,743	$43,584	$105,433	$149,017	8.00	7.80	-5.41
2011	1,320,000	$39,776	$106,062	$145,838	8.04	7.191	1,356,290	$46,014	$111,095	$157,109	8.19	7.98	-5.41
2012	1,355,000	$47,739	$111,475	$159,214	8.23	7.407	1,395,555	$45,825	$117,005	$162,830	8.38	8.17	-5.57
2013	1,396,000	$49,240	$119,246	$168,486	8.54	7.407	1,437,449	$54,035	$125,018	$179,053	8.70	8.48	-5.57
2014	1,438,000	$48,753	$126,856	$175,609	8.82	7.407	1,480,882	$55,600	$132,905	$188,505	8.97	8.75	-5.57
2015	1,482,000	$58,626	$131,895	$190,521	8.90	7.629	1,525,517	$55,137	$144,219	$199,356	9.45	9.22	-5.74
2016	1,522,000	$60,536	$143,248	$203,784	9.41	7.629	1,567,074	$65,500	$151,045	$216,545	9.64	9.37	-5.74
2017	1,565,000	$69,343	$148,053	$217,396	9.46	7.629	1,609,360	$67,423	$155,765	$223,188	9.68	9.41	-5.74
2018	1,611,000	$70,670	$161,097	$231,767	10.00	7.858	1,656,390	$76,541	$169,362	$245,903	10.22	9.94	-5.91
2019	1,662,000	$79,702	$173,780	$253,482	10.46	7.858	1,708,026	$77,968	$182,351	$260,319	10.68	10.38	-5.91
2020	1,716,000	$80,899	$186,096	$266,995	10.84	7.858	1,762,360	$87,305	$195,020	$282,325	11.07	10.77	-5.91
2021	1,771,000	$91,921	$194,409	$286,330	10.98	8.094	1,816,678	$88,552	$209,228	$297,780	11.52	11.21	-6.09
2022	1,827,000	$93,349	$208,586	$301,935	11.42	8.094	1,871,694	$87,194	$224,478	$311,672	11.99	11.69	-6.09
NPV ($000s)				$1,564,526						$1,618,349			

Reference:
Col. B - See Workpaper H, Page 41, Col. 1 x 1000 x (1-.0627). Assumes T&D loss factor of 6.27%.
Col. C - See Workpaper H, Page 41, Col. 9.
Col. D - See Workpaper H, Page 41, Col. 8.
Col. I - See Workpaper H, Page 42, Col. 9 + Workpaper H, Page 50, Col. 4.
Col. J - See Workpaper H, Page 42, Col. 8 + Workpaper H, Page 51, Col. 4 + Workpaper H, Page 51, Col. 6.
Col. M - For 2003-2008, See Workpaper H, Page 42, Col. 8 ÷ (Col. H - Workpaper H, Page 52, Col. K).
For 2009-2022, See Workpaper H, Page 42, Col. 8 ÷ (Col. H - Workpaper H, Page 53, Col. G).

[1] FC embedded in Schedule P base rates effective April 15, 1999 is 6.779 ¢/kWh. Escalated by 3% every 3 years to approximate rate increase impact.
[2] Based on rate analysis for 5 target Utility-CHP customers, and escalated by 3% every 3 years.

MAUI ELECTRIC COMPANY, LTD.

Details of Cost-Benefit Analysis of Utility CHP Program (Sheet 2 of 2)

	Change in System Costs			Estimated Incremental Revenues From Utility-CHP Program									
Year	Change in System Capacity Cost Revenue Requirements ($000s)	Change in System Energy Cost Revenue Requirements ($000s)	Total Change in System Cost ($000s)	Retained Sales (MWH)	Avoided A/C Load (MWH)	Total Retained Revenues From Retained Sales ($000/Yr)	Lost FC Revenues From Avoided A/C Load ($000/Yr)	Net Retained Revenues From Retained load ($000s)	Total Revenues From Thermal Load ($000s)	Total Revenues From Facilities Charge ($000s)	Lost Revenues From CHP Rate Discount ($000s)	Total Incremental Revenues From the Utility-CHP Program ($000/Yr)	Net Total System Benefit Due To Utility CHP Program ($000)
(A)	(O = C - I)	(P = D - J)	(Q = O + P)	(R)	(S)	[T = (G+M) x R]	(U = N x S)	(V = T + U)	(W)	(X)	(Y)	[Z = Σ(V:Y)]	(AA = Q + Z)
2003	-$234	-$54	-$288	737	106	$99.9	($5.4)	$94.5	$9.5	$1.3	($7.8)	$97.5	($190.5)
2004	-$905	-$556	-$1,461	7,929	2,545	$1,104.4	($129.8)	$974.6	$248.6	$37.1	($193.4)	$1,066.9	($394.1)
2005	-$1,839	-$1,063	-$2,902	14,997	5,978	$2,100.9	($304.9)	$1,796.0	$609.3	$95.2	($463.9)	$2,036.6	($865.4)
2006	-$2,935	-$1,876	-$4,811	20,316	9,716	$2,838.6	($510.1)	$2,328.5	$1,015.9	$158.2	($758.2)	$2,744.4	($2,066.6)
2007	-$3,774	-$2,540	-$6,314	27,029	13,513	$3,822.4	($709.4)	$3,113.0	$1,430.1	$222.3	($1,044.1)	$3,721.3	($2,592.7)
2008	$6,442	-$2,958	$3,484	32,948	15,505	$4,771.5	($814.0)	$3,957.5	$1,659.4	$256.9	($1,189.1)	$4,684.7	$8,168.7
2009	$8,473	-$3,916	$4,557	43,800	17,402	$6,535.4	($941.4)	$5,594.0	$1,779.8	$272.7	($1,331.7)	$6,314.8	$10,871.8
2010	-$3,329	-$4,496	-$7,825	50,177	18,434	$7,522.0	($997.3)	$6,524.7	$1,823.0	$274.7	($1,404.7)	$7,217.7	($607.3)
2011	-$6,238	-$5,033	-$11,271	55,757	19,467	$8,458.9	($1,053.2)	$7,405.7	$1,866.5	$276.2	($1,477.7)	$8,070.7	($3,200.3)
2012	$1,914	-$5,530	-$3,616	61,110	20,555	$9,519.1	($1,144.9)	$8,374.2	$1,910.4	$277.7	($1,554.9)	$9,007.4	$5,391.4
2013	-$4,795	-$5,772	-$10,567	62,538	21,089	$9,935.4	($1,174.7)	$8,760.7	$1,951.0	$278.7	($1,597.2)	$9,393.2	($1,173.8)
2014	-$6,847	-$6,049	-$12,896	64,929	22,047	$10,490.6	($1,228.0)	$9,262.6	$2,029.9	$280.2	($1,665.7)	$9,907.0	($2,989.0)
2015	$3,489	-$12,324	-$8,835	66,523	23,006	$11,208.5	($1,320.5)	$9,888.0	$2,109.4	$281.7	($1,734.3)	$10,544.8	$1,709.8
2016	-$4,964	-$7,797	-$12,761	69,104	24,030	$11,747.0	($1,379.3)	$10,367.7	$2,189.6	$283.2	($1,807.8)	$11,032.7	($1,728.3)
2017	$1,920	-$7,712	-$5,792	68,915	24,555	$11,742.4	($1,409.5)	$10,332.9	$2,267.0	$284.2	($1,849.3)	$11,034.8	$5,242.8
2018	-$5,871	-$8,265	-$14,136	70,903	25,513	$12,619.3	($1,507.8)	$11,111.5	$2,348.3	$285.7	($1,917.9)	$11,827.6	($2,308.4)
2019	$1,734	-$8,571	-$6,837	72,498	26,472	$13,222.2	($1,564.5)	$11,657.7	$2,430.3	$287.2	($1,986.5)	$12,388.7	$5,551.7
2020	-$6,406	-$8,924	-$15,330	73,496	27,136	$13,690.8	($1,603.7)	$12,087.1	$2,509.1	$288.2	($2,038.5)	$12,845.9	($2,484.1)
2021	$3,369	-$14,819	-$11,450	73,698	28,020	$14,226.7	($1,706.4)	$12,520.3	$2,592.3	$289.7	($2,101.5)	$13,300.8	$1,850.8
2022	$6,155	-$15,892	-$9,737	73,304	28,610	$14,502.5	($1,742.3)	$12,760.2	$2,672.1	$290.7	($2,148.0)	$13,575.0	$3,838.0
NPV ($000s)	**($7,908)**	**($45,915)**	**($53,823)**					**$57,959**	**$14,908**	**$2,079**	**($11,733)**	**$63,213**	**$9,390**

Reference:
Col. R - See Workpaper H, Page 54, Col. D.
Col. S - See Workpaper H, Page 54, Col. E.
Col. W - For 2003-2008, See Workpaper H, Page 52, Col. N. For 2009-2022, See Workpaper H, Page 53, Col. K.
Col. X - For 2003-2008, See Workpaper H, Page 52, Col. O. For 2009-2022, See Workpaper H, Page 53, Col. L.
Col. Y - For 2003-2008, See Workpaper H, Page 52, Col. L. For 2009-2022, See Workpaper H, Page 53, Col. I.

MECO CHP Avoided Cost
Unit Addition Timing

Year	Unit Addition Timing	
	Base Plan No Utility CHP	Alternate Plan With Utility CHP
2003		**Start Utility CHP Program**
2004		
2005	**Add 10 MW Wind**	**Add 10 MW Wind**
2006	**Add Maalaea 18** Add RDLC Add CBB	**Add Maalaea 18** Add RDLC Add CBB
2007	HC&S Contract Expires	HC&S Contract Expires
2008	**Add Waena 1 (CT)**	
2009		
2010		**Add Waena 1 (CT)**
2011		
2012	**Add Waena 2 (CT)**	
2013		**Add Waena 2 (CT)**
2014		
2015	**Add Waena 3 (STG)**	
2016		**Add Waena 3 (STG)**
2017	**Add Waena 4 (CT)**	
2018		**Add Waena 4 (CT)**
2019	**Add Waena 5 (CT)**	
2020		**Add Waena 5 (CT)**
2021	**Add Waena 6 (STG)**	
2022		

Notes:

1 June 2003 S&P Forecast for 2003-2008, June 1998 S&P Forecast for 2009-2022.
2 Acquired DSM 1996-2002 from Energy Services Department LFA files dated 5/19/03
Future DSM from Energy Services Department LFA files dated 7/17/03
3 CHP projected impacts from Forecasting Division
mdgfcst 8-20-03.xls
4 CHP non-utility impacts from Energy Services Department LFA files 7/16/03 & 7/17/03
Base Case assumes no utility CHP program
Alternate case includes utility CHP program
5 Utility CHP impacts from Energy Services Department LFA file (modeled as load modifier) 8/4/03
6 HC&S PPA contract expires 12/31/2007
7 Unit additions occur in January unless otherwise noted
8 July 2002 Fuel Price Forecast
9 Utility CHP life = 20 years