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PUBLIC UTILITIES COMMISSION

Edward L. Reinhardt
President

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
Maui Electric Company, Limited ("MECO")

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

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

MECO's generation capacity for the islands of Maui, Lanai and Molokai for the next three years is sufficiently large to meet all reasonably expected demands for service and provide reasonable reserves for emergencies.

1.0 Maui Division

1.1 Peak Demand and System Capability in 2009

Maui's 2009 system peak occurred on October 21, 2009, and was 199,900 kW (net) or 204,300 kW (gross). The total system capability of Maui was 262.3 MW (net) at the time of the system peak, resulting in a reserve margin of approximately 31% over the 2009 system peak, as shown in Attachment 1.

1.2 Determination of Maui Division's Adequacy of Supply

1.2.1 Maui Division Capacity Planning Criteria

The following capacity planning criteria are used to determine the timing of an additional generating unit for the Maui Division:

> *New generation will be added to prevent the violation of the rule listed below where "units" mean all units and firm capacity suppliers physically connected to the system, and "available unit" means an operable unit not on scheduled maintenance.*
>
> *The sum of the reserve ratings of all 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.*
>
> *In addition, consideration will be given to maintaining a reserve margin of approximately 20 percent based on Reserve Ratings.*

1.2.2 Other Considerations in Determining the Timing of Unit Additions

The need for new generation is not based solely on the application of the criteria previously mentioned. As capacity needs become imminent, it is essential that MECO broaden its consideration to ensure timely installation of generation capacity necessary to meet its customers' energy needs. As stated in the Capacity Planning Criteria:

> *The preceding rules apply to capacity planning in long-range generation expansion studies. The actual commercial operation date for the next unit to be added shall also be determined using these rules as guides, with due consideration given to short-term operating conditions, equipment procurement, construction, regulatory approvals, financial and other constraints, etc.*

Other near-term considerations may include:

- the current condition and rated capacity of existing units;
- the preferred mix of generation resources to meet varying daily and seasonal demand patterns at the lowest reasonable capital and operating costs;
- the forecasted minimum demand;
- required power purchase obligations and contract terminations;

- the unpredictable output of supplemental resources;
- the uncertainties surrounding Non-Utility Generation ("NUG") resources;
- transmission system considerations; and
- system stability considerations for MECO's isolated system.

1.3 Peak Demand

1.3.1 Recorded Peak Demand

Maui's 2009 system peak of 204.3 MW (gross) or 199.9 MW (net) occurred on October 21, 2009. The 2009 annual gross peak was 5.3 MW higher than the 2008 gross system recorded peak of 199.0 MW (gross) or 194.4 MW (net) set on January 9, 2008. The following table shows the Maui historical system peak demand.

Table 1.3.1-1: Recorded System Peak Demand

Year	Recorded System Peak, MW-Net
2005	202.1
2006	206.4
2007	204.4
2008	194.4
2009	199.9

Maui's higher system peak in 2009 compared to 2008 appears to have been due to hot and humid weather conditions in 2009.

1.3.2 Projected Peak Demand

The following table shows the projected peak demand for Maui over the next seven years:

Table 1.3.2-1: Maui Forecast Peak Demand (2010-2016)

Year	Forecast System Peak Demand without DSM Impacts, MW-Net	Forecast Future and Acquired DSM Impacts, MW-Net	Forecast Impacts of Load Management DSM, MW Net	Forecast System Peak Demand with Peak Reduction Benefits of DSM, MW-Net
2010	196.8	12.9	0.0	183.9
2011	199.1	14.1	2.4	182.6
2012	200.8	14.9	4.6	181.3
2013	202.5	15.5	6.9	180.1
2014	204.5	16.2	8.4	179.9
2015	207.1	16.8	8.8	181.5
2016	209.5	17.0	9.1	183.4

On June 10, 2009, MECO adopted a new peak forecast ("June 2009 Peak Forecast.") The June 2009 Peak Forecast projected a 2009 peak of 185.8 MW, which was 14.1 MW lower than the recorded peak. As stated earlier, the recorded peak appears to have been due to unusual weather conditions. The forecasted peaks, however, are tied to the sales forecast. MECO has consistently used this methodology in the past to forecast peaks, and it has yielded reasonable results. MECO believes that short-term differences between forecasted and recorded peaks could typically be expected to smooth out over a longer period of time. Such short-term differences do, however, confirm the need for MECO to continuously monitor recorded peaks, changes in the economy, and other factors that affect sales and peak growth. MECO also needs to continue to evaluate and plan for the implementation of several different resource options that could serve as contingencies in the short and long term. These contingencies are mentioned in more detail in Section 1.7.3 of this letter.

As the table above indicates, the peak demand is forecasted to decrease significantly in 2010 compared to the 2009 recorded system peak. The peaks are expected to continue decreasing through 2014 and then grow beginning in 2015, though at a slower pace and at lower levels than previously forecasted. The peak

forecast reflects the lowered sales expectations due to continued poor economic conditions, and anticipated recovery, at a very gradual pace. Although the number of customers is expected to increase, the average use per customer is projected to continue to decrease. Major factors that put downward pressure on average use per customer include continued energy conservation, installation of energy efficiency measures and expanded installation of renewable energy resources such as photovoltaic systems. Additionally, acquired energy efficiency demand-side management ("DSM") impacts and forecasted load management DSM impacts are higher than previously projected, which explains, in part, the lower forecasted system peak.

1.4 Reductions in Peak Demand

1.4.1 MECO's Energy Efficiency DSM Programs (Maui Division)

At the time of the system peak, Maui had in place seven load management contracts totaling 5,000 kW under Rider M, which reduced the evening peak by approximately 3,100 kW. In addition, Maui has had residential and commercial & industrial energy efficiency DSM programs in place since 1996, which reduced the system peak by an estimated 14,152 net kW (net of free riders).

On February 13, 2007, the Commission issued Decision and Order No. 23258 in the Energy Efficiency proceeding (Docket No. 05-0069). The Commission ordered that the energy efficiency programs transition to a non-utility administrator by January 2009. Effective July 1, 2009, the administration of MECO's energy efficiency DSM programs was transitioned to a third party administrator, the Hawaii Energy Efficiency Program ("HEEP") Administrator. Therefore, energy efficiency program impacts for customers who participated in the programs prior to July 1, 2009 are based on MECO records, which were included in the calculation of the estimated system peak reduction stated above. In addition, projected long-term energy efficiency DSM impacts reflected in the AOS analyses are based on the utility's estimates developed prior to July 1, 2009. Adjustments to the long-term projection will be made as further information becomes available from the third party administrator.

MECO will continue to administer the SolarSaver Pilot ("SSP") Program through the end of its pilot program on June 30, 2010, consistent with the Commission's *Order Denying HECO Companies' Amendments to the SolarSaver Pilot Program, Filed December 31, 2008*, dated April 9, 2009, in Docket No. 2006-0425. Therefore, energy efficiency program impacts for customers who participated in the SSP Program were included in the calculation of the estimated

system peak reduction stated above and based on MECO records through December 2009.

Unlike the energy efficiency DSM Programs, load management DSM programs will continue to be administered by the utilities.

1.4.2 Maui Load Management DSM Program

In MECO's 2009 AOS letter, the Company stated its plans to submit two separate applications seeking Commission approval of its residential and commercial & industrial direct load control programs, RDLC and CIDLC, respectively, by June 30, 2009. However, the Company has not yet filed program applications with the Commission for approval due to the results of MECO's Annual Sales and Peak Forecasts adopted in May and June 2009 ("2009-2017 Sales and Peak Forecasts"), which reflect the State's and especially Maui County's weak economy and expected gradual recovery. The implementation of demand response programs, such as utility RDLC and CIDLC programs will be re-evaluated based on future sales and peak forecasts.

The following table shows the cumulative forecasted peak impacts of the load management DSM programs for the years 2010-2016. Forecasted impacts of load management DSM programs were assumed to begin in 2011.

Table 1.4.2-1: Load Management DSM Program Impacts (2010-2016)

Year	Forecasted Impacts of Load Management DSM (MW-Net)
2010	0.0
2011	2.4
2012	4.6
2013	6.9
2014	8.4
2015	8.8
2016	9.1

1.4.3 Net Peak Demand

The peak reduction benefits of energy efficiency DSM are reflected in the forecast of peak demand shown in Table 1.3.2-1. The load management programs

are treated as a resource that can offset demand and are reflected in the calculation of reserve margins shown in Table 1 in Attachment 1.

1.4.4 Combined Heat and Power ("CHP") / Distributed Generation ("DG")

Firm DG resources can provide generating capacity if they can be reliably dispatched by the utility, or can provide reliable load reductions if operated by customers. MECO had previously forecasted firm DG resources, namely CHP, in its AOS evaluations for the past several years, but the lack of interconnection requests for new third-party CHP activities has caused MECO to not forecast potential third-party CHP projects. MECO has no utility CHP plans for the island of Maui. MECO will include third-party CHP projects in its forecast as interconnection requests are received; however, there are no such requests at this time, so the current CHP forecast is zero.

MECO, with Hawaiian Electric's assistance, will continue to evaluate its options with DG, including potential dispatchable standby generation ("DSG") projects similar to Hawaiian Electric's Honolulu Airport DSG Project.

1.5 Total Firm Capacity

1.5.1 Maui Division Firm Capacity

1.5.1.1 Hana Distributed Generation

In December 2008, MECO completed the installation of communication and controls equipment to the two 1,000 kW standby diesel engine generators, located at Hana Substation No. 41, to enable the units to be operated as dispatchable distributed generation. This project provides MECO with the means to operate the Hana generators in parallel to the system and as emergency units. These units have the capability to be indirectly, remotely controlled and automatically brought on line. Currently, the units are used for fully automated emergency generation and are also used as dispatched generation, although requiring manual operation. As such, the units are currently utilized as both emergency generation and dispatchable generation. As a result, the Hana units have been designated as firm capacity and their capacity is included in the total reserve rating of the Maui system capability.

1.5.1.2 Total Maui Division Firm Capacity

The Maui Division has a total of 246.3 MW-net of firm capacity. A summary of MECO's firm capacity, as of December 31, 2009, is shown in Attachment 2.

1.5.2 HC&S Power Purchase Agreement ("PPA")

MECO filed a letter with the Commission in Docket No. 6616 (Hawaiian Commercial & Sugar Company ["HC&S"]), on July 25, 2007, which informed the Commission that MECO and HC&S agreed on July 2, 2007 not to issue a notice of termination of the PPA resulting in termination of the PPA prior to the end of the day on December 31, 2014.[1] This agreement was reached so that HC&S will have more certainty as to the future revenue sources supporting its sugar business, MECO will be able to rely on the continued availability of power from HC&S (a firm, non-fossil fuel power producer) beyond the end of 2011 in planning MECO's generating system and in meeting its Renewable Portfolio Standards, and both parties will have additional time in which to consider HC&S' future plans before negotiating a new, long-term PPA. For planning purposes, MECO assumes the HC&S PPA will terminate at the end of 2014. However, MECO will continue to have discussions with HC&S regarding the future of their operations. This may lead to negotiations for a possible agreement not to terminate the PPA beyond 2014. If the PPA is assumed to continue in effect beyond 2014, the timing for the need for future increments of firm capacity will be affected.

1.5.3 Total Firm Capacity on Maui

The total firm generating capacity on Maui will be 262.3 MW-net, including both MECO and HC&S generation. The Maui Division's total system capacity would be reduced by 16 MW if HC&S does not continue its operations beyond the December 31, 2014 termination date of the existing power purchase contract.

1.6 Load Service Capability

Based on the forecast provided in Section 1.3.2 above (including the peak reduction benefits of energy efficiency DSM), the projected peak reduction benefits of load management programs, the projected peak reduction benefits of the CHP programs, the total existing firm capacity on the MECO system, Maui Division's planned

[1] A previous agreement between MECO and HC&S (June 28, 2005) not to issue a notice of termination of the PPA resulted in the termination of the PPA prior to the end of the day on December 31, 2011. At the time, the resulting need date for new firm capacity was deferred from 2009 to 2011.

maintenance schedule as of July 2009, and the application of MECO's capacity planning criteria, there are no projected reserve capacity shortfalls, as shown in Table 1.6-1 below, with the assumption that no new firm capacity is added to the system.

Table 1.6-1: Load Service Capability Margin Shortfall and Reserve Capacity Deficit Based on 20% Reserve Margin

Year	Forecast Peak Demand, MW-net	Total Firm Capacity on MECO System, MW-net	Largest Load Service Capability Margin Shortfall (Rule 1) MW-net	Largest Reserve Capacity Deficit by 20% Minimum Reserve Margin, MW-net
2010	183.9	262.3	0.0	0.0
2011	182.6	262.3	0.0	0.0
2012	181.3	262.3	0.0	0.0
2013	180.1	262.3	0.0	0.0
2014	179.9	262.3	0.0	0.0
2015	181.5	246.3	0.0	0.0
2016	183.4	246.3	0.0	0.0

1.7 Impact of New Forecast on Need for Additional Firm Generating Capacity

The timing of the need for additional firm generating capacity was determined through the application of Maui Division's capacity planning criteria, as explained in Section 1.2.1, and with consideration given to other factors, as described below. Two of the key inputs in the application of the capacity planning criteria are the forecasted peaks and the total system capacity. An analysis showed that with the June 2009 peak forecast, a capacity planning criteria violation will occur in 2021. Refer to Attachment 3 for the system capability chart used to determine the timing and extent of the violation.

1.7.1 Other Considerations in Determining the Timing of Unit Additions

The determination of the timing of the need for additional firm capacity is not based solely on MECO's capacity planning criteria. For example, Section 1.2.2 identified other factors that are considered. In addition, consideration is given to the uncertainty of the inputs used in the application of MECO's capacity planning criteria. For example, there may be an increasing need for firm capacity in the future if:

- The system peak is higher than forecasted. This could be due to hotter weather, lower rainfall resulting in higher irrigation and drinking water

pumping loads or more rapid than forecasted economic growth that result in greater than forecasted peak demand. Consideration may be given to a higher peak forecast scenario as a representation of non-normal weather or more rapid economic growth. A sensitivity analysis for higher than forecasted system peaks has been provided in Attachment 4.

- Planned or unplanned firm projects on Maui enter the system prior to 2021.

- Demand Side Management programs (energy efficiency and load management) provide peak reduction benefits that are less than currently projected.

Conversely, if, individually or cumulatively, DSM programs, third party CHP projects, and load management programs provide greater impacts than currently forecasted, and/or if system peak demand is lower than currently forecast, then the timing of the need for additional firm capacity could be deferred beyond 2021. In summary, MECO considers a number of potential scenarios with different inputs, or different levels of inputs, to determine when new firm generating capacity should be installed.

Attachment 4 provides an analysis of a high peak forecast scenario. The high peak forecast scenario was developed from a statistical analysis of sales variability over the 1992-2008 periods. The analysis using the high peak scenario indicates that additional firm generating capacity could be needed as soon as 2015.

Given the uncertainties in the planning environment, the need for additional firm capacity on Maui may occur as soon as 2015 with a high peak forecast or beyond 2021. However, the risks to system reliability are asymmetrical. If MECO forecasts a need date on or prior to 2021 and the need for capacity turns out to be later than 2021, MECO could potentially take steps to defer the installation of new capacity. On the other hand, if MECO forecasts a need date on or following 2021 and the need date for capacity turns out to be earlier, MECO may have a limited ability to accelerate the installation schedule given the lead-time required in connection with a competitive bidding process and for the successful bidder to acquire the necessary permits, procure major equipment and construct the facility. Therefore, while MECO's analysis, provided in Attachment 3, indicates a 3.8 MW violation of its capacity planning criteria in 2021 and the Company is targeting installation of new capacity for that date, MECO will continue to perform contingency planning for the implementation of mitigating measures given the uncertainties described above and the asymmetrical risk in planning for these uncertainties.

1.7.2 Competitive Bidding for New Generation

On December 8, 2006, the Commission issued Decision and Order No. 23121 ("D&O 23121") in Docket No. 03-0372 pertaining to competitive bidding for new generation. Attached to D&O 23121 was the Commission's Framework for Competitive Bidding dated December 8, 2006 ("CB Framework"). Section II.A.3 of the CB Framework requires that electric utilities that are subject to the CB Framework acquire new generating capacity through a competitive bidding process, unless a waiver is sought by the utility and the waiver is granted by the Commission.

In December 2007, in response to MECO's request for approval to proceed with a competitive bidding process to acquire two separate increments of approximately 20 MW to 25 MW of firm generating capacity on the island of Maui in the 2011 and 2015 timeframes, the Commission opened a new docket (Docket No. 2007-0403) related to MECO's proposed Request for Proposals ("RFP"), identified MECO and the Consumer Advocate as parties to the docket and approved MECO's contract with the Independent Observer for the proposed RFP. Due to subsequent reductions in the forecasts for peak demand, the need date for the next increment of firm capacity for the island of Maui was deferred to 2021. As a result, in October 2009, MECO requested that the Commission close Docket No. 2007-0403. In November 2009, the Commission approved the closing of Docket No. 2007-0403 and the termination of the Independent Observer's contract.

Based on the currently forecasted 2021 need date for the next increment of firm capacity on Maui, MECO plans to solicit proposals in the 2015 timeframe, pursuant to the CB Framework, for new generating capacity via a competitive bidding process.

1.7.3 Contingency Planning for Capacity Needed in 2015

As Table 1.7.4-1 illustrates, forecasted peaks can change dramatically from one forecast to the next. While forecasted peaks showed a marked decrease from the December 2008 peak forecast to the June 2009 peak forecast, dramatic increase in forecasted peaks can also occur from one forecast to the next, as Hawaiian Electric, MECO's parent company, has experienced in the past.

Table 1.7.4-1
Comparison of Forecast Peaks

Year	Peak (MW-net) Reduced by Energy Efficiency DSM and CHP			
	Recorded	December 2008 Forecast	June 2009 Forecast	Difference
2004	206.5			
2005	202.1			
2006	206.4			
2007	204.4			
2008	194.4	196.7		
2009	199.9	194.8	185.9	-8.9
2010		196.6	183.9	-12.7
2011		201.0	185.0	-16.0
2012		206.7	185.9	-20.8
2013		211.1	187.0	-24.1

Higher demand of 3 MW to 4 MW in a year could advance the need for additional firm capacity by one year or more. Should MECO need additional firm capacity before 2021, MECO could implement one or more of the following mitigation measures including but not limited to: initiating competitive bidding to install new central station firm generating capacity, installing distributed generation or distributed standby generation, re-optimizing unit overhaul schedules, deviating from standard maintenance practices, coordinating with HC&S for the delivery of supplemental power, pursuing load management programs, or requesting voluntary customer curtailment of demand during load service capability shortfall periods.

Given the possibility that the Maui system may experience system peaks higher than forecasted, as seen in 2009, and a need for additional capacity as early as 2015, MECO will continue to explore and evaluate appropriate supply-side and demand-side resources for the Maui Division system.

2.0 Lanai Division

2.1 Peak Demand and System Capability in 2010 - 2012

Lanai's 2009 system peak of 4,700 kW (gross) occurred on both July 16, 2009 and August 19, 2009. Lanai had a 2009 reserve margin of approximately 118%. Attachment 1, Table 2, also shows the expected reserve margins over the next three years, based on the MECO 2010-2017 Peak Forecast dated June 2009.

2.2 Reductions in Peak Demand: Lanai's Energy Efficiency DSM Programs

Lanai has had residential and commercial & industrial demand side management programs in place since 1996, which reduced the system peak by an estimated 148.6 gross kW (net of free riders). As stated earlier in section 1.4.1, effective July 1, 2009, the administration of MECO's energy efficiency DSM programs was transitioned to the HEEP Administrator. Therefore, energy efficiency program impacts for customers who participated in the programs prior to July 1, 2009 are based on MECO records, and were included in the calculation of the estimated system peak reduction stated above. In addition, projected long-term energy efficiency DSM impacts reflected in the AOS analyses are based on the utility's estimates developed prior to July 1, 2009. Adjustments to the long-term projection will be made as further information becomes available from the third party administrator.

Further, as noted in section 1.4.1, MECO will continue to administer the SSP Program through the end of its pilot program on June 30, 2010. The energy efficiency program impacts for customers who participated in the SSP Program were included in the calculation of the estimated system peak reduction stated above and based on MECO records through December 2009.

2.3 Lanai Division Capacity Planning Criteria

The following criterion is used to determine the timing of an additional generating unit for the Lanai Division and the Molokai Division:

New generation will be added to prevent the violation of any one of the rules listed below where "units" mean all units and firm capacity suppliers physically connected to the system, and "available unit" means an operable unit not on scheduled maintenance.

1. *The sum of the normal top load ratings of all units must be equal to or greater than the system peak load to be supplied.*

2. *With no unit on maintenance, the sum of the reserve ratings of all units minus the reserve rating of the largest available unit must be equal to or greater than the system peak to be supplied.*

3. *With a unit on maintenance:*

   a) *The sum of the reserve ratings of all units minus the reserve rating of the largest available unit must be equal to or greater than the daytime peak load to be supplied.*

   b) *The sum of the reserve ratings of all units must be equal to or greater than the evening peak load to be supplied.*

2.4 Lanai Combined Heat and Power Project

The Commission approved the CHP agreement between MECO and Castle & Cooke in Decision & Order No. 24058, filed February 28, 2008, in Docket No. 2006-0186. The project was completed and placed in-service on September 30, 2009.

2.5 Lanai Sustainability Research ("LSR") Project

The Lanai Sustainability Research project on the island of Lanai is a 1.2 MW photovoltaic ("PV") facility. The PV facility was first placed into service on December 19, 2008. Under the current PPA between MECO and LSR, the output of the facility will be integrated into the Lanai system in phases. Currently, the 1.2 MW PV facility is providing up to 600 kW of as-available energy and anticipates providing up to 1.2 MW with the installation of a battery–based energy storage system (approximately 500 kW), in 2010. The PV facility does not affect the Lanai system capability because it is an as-available resource.

Although, the addition of the Manele Bay CHP unit and the 1.2 MW as-available photovoltaic facility on Lanai presents operational challenges on existing units at Miki Basin, these installations also present a unique opportunity to integrate an as-available resource and a heat recovery resource into the Lanai grid. These projects allow MECO the opportunity to learn from these installations and to look at this as a stepping stone toward a greater amount of renewable energy resources into the utility grids. Interconnection and protection studies have been performed to identify the design and operational considerations for the integration of these projects into the Lanai system. However, the changes to the system are continually monitored.

3.0 Molokai Division

3.1 Peak Demand and System Capability in 2010 - 2012

Molokai's 2009 system peak occurred on October 27, 2009 and was 5,950 kW (gross). Molokai had a 2009 reserve margin of approximately 102%. Attachment 1, Table 2, also shows the expected reserve margins over the next three years, based on the MECO 2010-2017 Peak Forecast dated June 2009.

3.2 Reductions in Peak Demand: Molokai's Energy Efficiency DSM Programs

At the time of the system peak, Molokai had in place one load management contract totaling 483 kW under Rider M, which reduced the evening peak by approximately 1 kW. In addition, Molokai has had residential and commercial & industrial DSM programs in place since 1996, which reduced the system peak by an estimated 488.8 gross kW (net of free riders). As stated earlier in sections 1.4.1 and 2.2, effective July 1, 2009, the administration of MECO's energy efficiency DSM programs was transitioned to the HEEP Administrator. Therefore, energy efficiency program impacts for customers who participated in the programs prior to July 1, 2009 are based on MECO records, and were included in the calculation of the estimated system peak stated above. In addition, projected long-term energy efficiency DSM impacts reflected in the AOS analyses are based on the utility's estimates developed prior to July 1, 2009. Adjustments to the long-term projection will be made as further information becomes available from the third party administrator.

Further, as noted in section 1.4.1 and 2.2, MECO will continue to administer the SSP Program through the end of its pilot program on June 30, 2010. The energy efficiency program impacts for customers who participated in the SSP Program were included in the calculation of the estimated system peak reduction stated above and based on MECO records through December 2009.

3.3 Molokai Division Capacity Planning Criteria

Molokai Division's capacity planning criteria are identical to those of the Lanai Division. See Section 2.3 above, Lanai Division Capacity Planning Criteria.

4.0 Conclusion

MECO has sufficient capacity to meet forecasted loads over at least the next three years. With the May 2009 sales forecast and June 2009 peak forecast and other updated information, the need date for additional firm generating capacity on Maui has been determined to be 2021 under a base case scenario and as early as 2015 in a high peak load scenario. MECO's activities, such as those related to the planned RFP and any parallel or contingency plans, will be based on the base case scenario and consideration of a high peak load and other potential scenarios. Therefore, MECO will give consideration to preserving the ability to meet an earlier need date should future forecasts project higher than currently forecasted peak demand.

Very truly yours,

Edward L. Reinhardt

Attachments

c: Division of Consumer Advocacy (with Attachments)

Table 1
Maui Adequacy of Supply

Year	System Capability at Annual Peak Load[III] (kW) [A]	Without Future DSM (Includes Acquired DSM)[I] System Peak[IV] (kW) [B]	Without Future DSM Reserve Margin (%) [[A-B] / B]	With Future DSM (Includes Acquired DSM)[II] System Peak[IV] (kW) [C]	With Future DSM Reserve Margin (%) [[A-C] / C]
Maui Division (Net Generation)					
Recorded					
2009	262,300 [V]	199,900 [VI]	31%	N/A	N/A
Future					
2010	262,300	185,400	41%	183,900	43%
2011	262,300	187,700	40%	182,600 [VII]	44%
2012	262,300	189,900	38%	181,300	45%
2013	262,300	192,300	36%	180,100	46%
2014	262,300 [VIII]	194,800	35%	179,900	46%
2015	246,300	198,600	24%	181,500	36%
2016	246,300	201,700	22%	183,400	34%
Maui Division (Gross Generation) [IX]					
Recorded					
2009	267,700 [V]	204,300 [VI]	31%	N/A	N/A
Future					
2010	267,700	189,500	41%	187,900	42%
2011	267,700	191,800	40%	186,600 [VII]	43%
2012	267,700	194,100	38%	185,300	44%
2013	267,700	196,500	36%	184,100	45%
2014	267,700 [VIII]	199,100	34%	183,900	46%
2015	251,700	203,000	24%	185,500	36%
2016	251,700	206,100	22%	187,400	34%

Notes – Table 1:

(I) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):
Implementation of full-scale energy efficiency DSM programs began in the second half of 1996 following Commission approval of the programs. The forecasted system peak values for the years 2010-2016 include the actual peak reduction benefits acquired in 1996-2008 and also include the estimated peak reduction benefits acquired in 2009, as well as peak reduction benefits of Rider M and T customer contracts, and existing 3rd Party CHP impacts.

(II) System Peaks (With Future Peak Reduction Benefits of DSM Programs)
The forecasted System Peaks for 2010-2016 include the peak reduction benefits of Rider M and T customer contracts, and existing 3rd Party CHP impacts. Peak reduction benefits also include energy efficiency DSM programs (acquired and future). Forecasted energy efficiency DSM programs for 2010-2016 are based on the utility's estimates developed prior to July 1, 2009.

(III) The net reserve ratings of the units are used in the determination of the Maui system capability. In addition, the Maui Division system capability includes 16,000 kW (which includes 4,000 kW of system protection capacity) from HC&S. When the system capability at the time of the system peak differs from the year-end system capability, an applicable note will indicate the year-end system capability.

(IV) The 2010-2016 annual forecasted system peaks are based on MECO's June 2009 Peak Forecast and includes reductions for existing 3rd Party CHP impacts. The Maui annual forecasted system peak is expected to occur in the month of July.

(V) Includes the Hana generating units as firm capacity. Hana communications and control project was completed in 2008, enabling the Hana units to be dispatchable distributed generation.

A 30 MW independent power producer ("IPP") wind farm resource was added to the Maui system on June 9, 2006. MECO and Kaheawa Wind Power ("KWP") executed a new purchase power agreement ("PPA") on December 3, 2004. MECO submitted an Application in Docket No. 04-0365 on December 16, 2004, requesting Commission approval of the PPA. On March 18, 2005, the Commission issued Decision & Order No. 21701 approving the PPA. The installation of this wind resource will not affect the system capability because the wind resource is an as-available resource, which is not dispatchable and cannot provide given amounts of power at scheduled times.

On September 22, 2006, Makila Hydro, LCC, an IPP, completed construction of a 500 kW hydro-electric facility and commenced providing energy to the Maui system. MECO and Makila executed a PPA on May 10, 2005. MECO submitted an application in Docket No. 05-0161 on June 28, 2005, which among other things, requested Commission

approval of the PPA. On May 10, 2006, the Commission issued Decision & Order No. 22460, approving the PPA. The installation of this hydro resource does not affect the system capability because the hydro resource is an as-available resource, which is not dispatchable and cannot provide given amounts of power at scheduled times. Makila Hydro experienced equipment failure and became unavailable on October 15, 2006. In November 2009, after making repairs at its generation facility, Makila Hydro resumed power production through a new interconnection location. Since then, the facility has provided power to the Maui system on an intermittent basis, while the developer continues to work towards establishing regular daily operations.

Maalaea Unit 18, steam turbine generator (Phase III of a nominal 56,780 kW (net) dual train combined-cycle unit), was placed in service on October 27, 2006.

On July 25, 2007, MECO filed a letter with the Commission in Docket No. 6616 (HC&S), which informed the Commission that MECO and HC&S agreed on July 2, 2007 not to issue a notice of termination of the PPA resulting in termination of the PPA prior to the end of the day on December 31, 2014.[2]

(VI) The actual 2009 recorded system peak was 204,300 kW (gross) which is equivalent to 199,900 kW (net).

(VII) Includes a reduction in system peak load due to the implementation of planned Commercial and Industrial Direct Load Control and Residential Direct Load Control Load Management DSM Programs developed in MECO's IRP-3 Report. Load management DSM Program impacts are forecasted to start in 2011.

(VIII) Capacity planning assumption that the HC&S non-termination agreement will end on December 31, 2014.

(IX) The Maui Division Gross Generation data is provided here for comparative purposes.

[2] Previously, in a letter dated June 28, 2005, MECO and HC&S had agreed that neither company would give written notice of termination resulting in a termination of the PPA prior to the end of the day on December 31, 2011. MECO filed the June 28, 2005 letter with the Commission on July 27, 2005 in Docket No. 6616.

Table 2
Lanai and Molokai Adequacy of Supply

Year	System Capability at Annual Peak Load[III] (kW) [A]	Without Future DSM (Includes Acquired DSM)[I]		With Future DSM (Includes Acquired DSM)[II]	
		System Peak[IV] (kW) [B]	Reserve Margin (%) [[A-B] / B]	System Peak[IV] (kW) [C]	Reserve Margin (%) [[A-C] / C]
Lanai Division (Gross Generation)					
Recorded					
2009	10,230 [V]	4,700	118%	N/A	N/A
Future					
2010	10,230	4,670	119%	N/A	N/A
2011	10,230	4,687	118%	N/A	N/A
2012	10,230	4,705	117%	N/A	N/A
Molokai Division (Gross Generation)					
Recorded					
2009	12,010 [VI]	5,950	102%	N/A	N/A
Future					
2010	12,010	5,600	114%	N/A	N/A
2011	12,010	5,625	113%	N/A	N/A
2012	12,010	5,651	113%	N/A	N/A

Notes – Table 2:

(I) System Peaks (Without Future Peak Reduction Benefits of DSM Programs):
Implementation of full-scale DSM programs began in the second half of 1996 following Commission approval of the programs. The forecasted system peak values for the years 2010-2012 include the actual peak reduction benefits acquired in 1996-2008 and also include the estimated peak reduction benefits acquired in 2009.

(II) System Peaks (With Future Peak Reduction Benefits of DSM Programs):
Currently no future DSM impacts are forecasted for Lanai or Molokai.

(III) The gross reserve ratings of the units are used in the determination of the Lanai and Molokai system capabilities. When the system capability at the time of the system peak differs from the year-end system capability, an applicable note will indicate the year-end system capability.

(IV) The 2010 - 2012 annual forecasted system peaks are based on MECO's June 2009 Peak Forecast. The Lanai and Molokai annual forecasted system peaks are expected to occur in the month of January, respectively.

(V) Miki Basin Units LL-1 to LL-6 (six 1,000 kW diesel engine-generator units totaling 6,000 kW) were converted to peaking status at the end of 2006, and as such, can be relied on for 5,000 kW of capacity to the Lanai system.

MECO signed an agreement with Castle & Cooke Resorts for the installation of an 884 kW (net including electric chiller offset and auxiliary loads) CHP system at the Manele Bay Hotel. The CHP system was installed and placed in-service as of September 30, 2009.

MECO signed an agreement with Lanai Sustainability Research, LLC for the installation of a 1.2 MW photovoltaic system on the island of Lanai. In December 2008, partial facility completion and operation of this as-available resource was added to the Lanai system. Completion of the entire facility is projected to be in 2010. Refer to Section 2.5 for further details. The installation of this PV resource does not affect the system capability because the PV resource is an as available resource, which is not dispatchable and cannot provide given amounts of power at scheduled times.

(VI) Palaau Units 1 and 2 (two 1,250 kW Caterpillar units), and Palaau Units 3, 4, 5 and 6 (four 970 kW Cummins units) operate in peaking service. Because of the age and operating history of these units, MECO includes one Caterpillar unit and two Cummins units (1,250 + 970 + 970 = 3,190 kW) towards firm capacity for the Molokai system.

Maui Unit Ratings

As of December 31, 2009

Units	Gross (MW)		Net (MW)	
	Reserve	NTL[I]	Reserve	NTL[I]
M1	2.50	2.50	2.50	2.50
M2	2.50	2.50	2.50	2.50
M3	2.50	2.50	2.50	2.50
X1	2.50	2.50	2.50	2.50
X2	2.50	2.50	2.50	2.50
M4	5.60	5.60	5.51	5.51
M5	5.60	5.60	5.51	5.51
M6	5.60	5.60	5.51	5.51
M7	5.60	5.60	5.51	5.51
M8	5.60	5.60	5.48	5.48
M9	5.60	5.60	5.48	5.48
M10	12.50	12.50	12.34	12.34
M11	12.50	12.50	12.34	12.34
M12	12.50	12.50	12.34	12.34
M13	12.50	12.50	12.34	12.34
M14/15/16[II]	58.00	58.00	56.78	56.78
M17/18/19[II]	58.00	58.00	56.78	56.78
Maalaea GS	212.10	212.10	208.42	208.42
K1	5.90	5.00	5.62	4.71
K2	6.00	5.00	5.77	4.76
K3	12.70	11.50	12.15	10.98
K4	13.00	12.50	12.38	11.88
Kahului GS	37.60	34.00	35.92	32.33
HC&S[III]	16.00	12.00	16.00	12.00
Hana 1[IV]	1.00	1.00	0.97	0.97
Hana 2[IV]	1.00	1.00	0.97	0.97
Maui System	267.70	260.10	262.28	254.69

Notes:

(I) NTL = Normal Top Load

(II) The NTL rating for long-term capacity planning purposes for each of the two Maalaea Dual Train Combined Cycle units, Maalaea Unit 14/15/16 and Maalaea Unit 17/18/19, is 56.78 MW (net). In the first and second quarters of 2008, MECO performed capability

tests on Maalaea Unit 14/15/16 and Maalaea Unit 17/18/19, respectively. Maalaea Unit 14/15/16 resulted in a net NTL rating of 56.27 MW (0.51 MW lower than the rated NTL) and M17/18/19 resulted in a net NTL of 56.20 MW (0.58 MW lower than the rated NTL). With consideration that the capabilities of these units can vary depending on ambient weather conditions, it was determined that the rated NTL of 56.78 MW (net) is acceptable.

(III) All values for HC&S are net to the system. The reserve ratings include an additional 4.0 MWs of system protection capacity.

(IV) Units located at Hana Substation No. 41. In December 2008, a communication and controls project was completed. This project provides MECO with the means to operate the Hana generators in parallel to the system and as emergency units. These units also have the capability to be indirectly, remotely controlled and automatically brought on line. With the completion of the project, the Hana units have been designated as firm capacity and are included in the total reserve rating of the Maui system capability.

Lanai Unit Ratings

As of December 31, 2009

Units	Gross (kW)	
	Reserve	NTL(I)
LL-1 (V)	1,000	1,000
LL-2 (V)	1,000	1,000
LL-3 (V)	1,000	1,000
LL-4 (V)	1,000	1,000
LL-5 (V)	1,000	1,000
LL-6 (V)	1,000	1,000
LL-7	2,200	2,200
LL-8	2,200	2,200
Miki Basin GS	9,400	9,400
Manele Bay CHP (VI)	1,000	830
Lanai System	10,400	10,230

(V) Miki Basin Units LL-1 to LL-6 (six,1,000 kW diesel engine-generator units totaling 6,000 kW) were converted to peaking status at the end of 2006, and as such, can be relied on for 5,000 kW of capacity to the Lanai system.

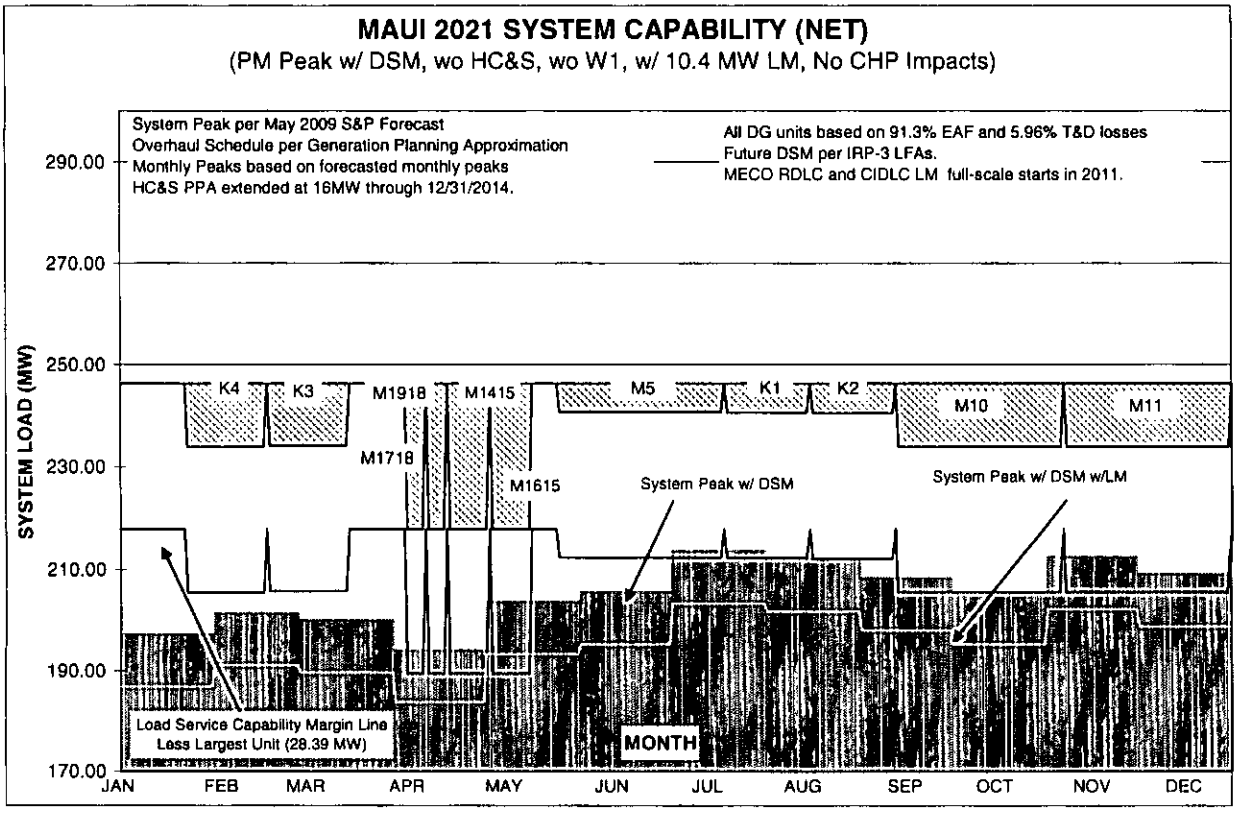
(VI) Manele Bay CHP in-service date of September 30, 2009.

Molokai Unit Ratings

As of December 31, 2009

Units	Gross (kW)	
	Reserve	NTL[(I)]
P-1[(VII)]	1,250	1,250
P-2[(VII)]	1,250	1,250
P-3[(VII)]	970	970
P-4[(VII)]	970	970
P-5[(VII)]	970	970
P-6[(VII)]	970	970
Solar CT	2,220	2,220
P-7	2,200	2,200
P-8	2,200	2,200
P-9	2,200	2,200
Palaau GS	12,010	12,010

(VII) Palaau Units 1 and 2 (two 1,250 kW Caterpillar units), and Palaau Units 3, 4, 5 and 6 (four 970 kW Cummins units) operate in peaking service. Because of the age and operating history of these units, MECO includes one Caterpillar unit and two Cummins units (1,250 + 970 + 970 = 3,190 kW) towards firm capacity for the Molokai system.



Month (1)	System Peak w/ DSM w/ Riders w/ Small Mkt CHP (MW) (2)	System Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (5)=(3)-(4)-(2)	% Reserve (Less Maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC Diff (MW) (8) = (5) - (7)	LSC Diff + LM (impact) (MW) (8) + 10.4 MW
JAN	197.3	246.28	12.4	36.6	19%	28.39	8.2	18.6
FEB	201.5	246.28	12.4	32.4	16%	28.39	4.0	14.4
MAR	200.1	246.28	12.2	34.0	17%	28.39	5.6	16.0
APR	194.2	246.28	28.4	23.7	12%	28.39	-4.7	5.7
MAY	203.7	246.28	28.4	14.1	7%	28.39	-14.2	-3.8
JUN	205.7	246.28	5.5	35.1	17%	28.39	6.7	17.1
JUL	213.7	246.28	5.6	27.0	13%	28.39	-1.4	9.0
AUG	212.1	246.28	5.8	28.4	13%	28.39	0.0	10.4
SEP	208.4	246.28	12.3	25.5	12%	28.39	-2.9	7.5
OCT	205.6	246.28	12.3	28.3	14%	28.39	-0.1	10.3
NOV	212.6	246.28	12.3	21.4	10%	28.39	-7.0	3.4
DEC	209.1	246.28	12.3	24.8	12%	28.39	-3.6	6.8

SENSITIVITY ANALYSIS: High Sales and Peak Forecast

A sensitivity analysis to the Maui base forecast involved MECO developing a high sales and peak demand forecast scenario based on the statistical likelihood of a higher system sales and peak demand than forecasted under a base case for the Maui Division. The high sales forecast scenario was developed by separately analyzing the recorded sales levels of residential and customer sectors for each year in the period of 1992 to 2008. Based upon these 17 years of sales, the median and distribution of annual sales for each sector was identified. From this distribution, a standard deviation from the median point was calculated for each sector and for the system in total. This calculated system level standard deviation of 125,688 MWh was then applied to each year of the base sales forecast, resulting in a high sales scenario at a constant band above the base case. Using this high sales forecast scenario, a peak forecast was developed using the same HELM peak forecasting model used to develop the base peak forecast. A comparison of the peak demand forecast for the "base" and "high" scenarios is shown in the following table.

Table A2-1

Year	Base Forecast System Peak Demand with DSM and CHP MW-Net	High Forecast System Peak Demand with DSM and CHP MW-Net	Difference
2009	185.8	207.5	21.7
2010	183.5	205.5	22.0
2011	184.2	206.6	22.4
2012	184.8	207.5	22.7
2013	185.6	208.6	23.0
2014	186.6	209.9	23.3
2015	188.2	211.9	23.7
2016	190.0	214.0	24.0
2017	192.8	217.2	24.4

The increase in overall demand will impact the timing of the need for additional firm generating capacity on the Maui system. Also contributing to the need for additional generation in 2015 is the potential loss of the 16 MW of capacity HC&S from the system on December 31, 2014, due to the expiration of the existing power purchase contract. Under the base scenario, it is forecasted that reserve capacity shortfall will occur in 2021. Under the high scenario, it is forecasted that reserve capacity shortfall, resulting in a need for additional generation, will occur in 2015 (see system capability chart at the end of Attachment 4). The maximum capacity shortfall in 2015 is forecasted to be approximately 4.4 MW.

As explained in Section 1.7 of this letter, the risks to system reliability are asymmetrical. MECO may have more flexibility in deferring the actual installation of generation capacity than it would in accelerating it. Consequently, MECO continued to preserve the ability to install a nominal 21 MW simple cycle combustion turbine at the Waena Generating Station by utilizing, to the extent possible, the engineering and air permitting work completed to date. MECO had made substantial progress toward obtaining the air permit for such a generating unit. In August,

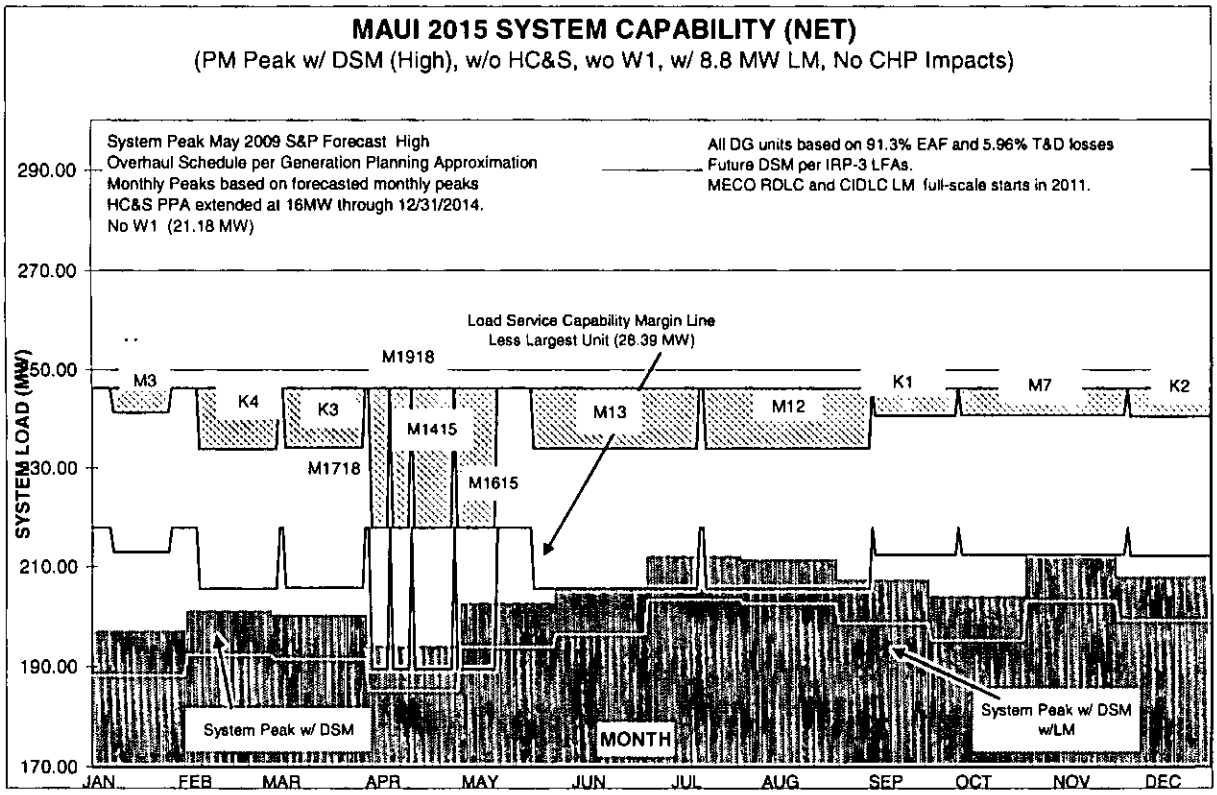
September and October 2007, MECO submitted responses to the State of Hawaii Department of Health's ("DOH") March 2007 request for information and clarification in connection with the permit application. On December 18, 2007, MECO submitted a permit application revision to use biodiesel as the primary fuel with No. 2 fuel oil as the backup fuel. In June and August of 2008, MECO provided additional information to the DOH regarding biodiesel and an emissions analysis.

On October 7, 2009, MECO met with DOH to request the extention of the Waena 1 air permit application as a result of the deferral of the forecasted need date for firm capacity on Maui. DOH, however, was not supportive of extending the air permit application and requested MECO to withdraw the permit. On October 22, 2009, MECO formally requested that its Waena 1 air permit application be withdrawn, and on November 9, 2009, DOH acknowledged MECO's request and closed the air permit application.

On October 15, 2009, MECO formally requested to the PUC that the MECO Firm Capacity Competitive Bidding Process, Docket No. 2007-4003, be closed since the need date for the next increment of firm capacity was deferred from 2015 to 2021. On November 25, 2009, the PUC issued an order to close the docket and to terminate the Independent Observer's contract.

Since the Waena 1 air permit application has been withdrawn from the DOH and the Commission has issued an order to close MECO's competitive bidding docket for a firm generation resource block, MECO will continue to evaluate resources options that would provide emergency capacity should demand return quicker than projected. In addition, because a new air permit application for new generation will likely require current data and information at the time that the new application is submitted, MECO will start preparing a new air permit application when a new competitive bid docket is opened for the next increment of firm capacity on Maui.

MECO will continue to monitor demand growth, the progress of the energy efficiency DSM programs, the implementation of load management programs, the CHP market, and other potential mitigation measures..



Month (1)	System Peak w/ DSM w/ Riders w/ Small Mkt CHP (MW) (2)	System Cap (MW) (3)	Maint (MW) (4)	Reserve (MW) (5)=(3)-(4)-(2)	% Reserve (Less Maint) (5) / (2)	Lrgst Avail (MW) (7)	LSC Diff (MW) (8) = (5) - (7)	LSC Diff + LM (impact) (MW) (8) + 8.8 MW
JAN	197.1	246.28	5.0	44.2	22%	28.39	15.8	24.6
FEB	201.1	246.28	12.4	32.8	16%	28.39	4.4	13.2
MAR	200.3	246.28	12.4	33.6	17%	28.39	5.2	14.0
APR	194.0	246.28	28.4	23.9	12%	28.39	-4.5	4.3
MAY	202.7	246.28	28.4	15.2	8%	28.39	-13.2	-4.4
JUN	205.2	246.28	12.3	28.8	14%	28.39	0.4	9.2
JUL	212.1	246.28	12.3	21.9	10%	28.39	-6.5	2.3
AUG	211.3	246.28	12.3	22.6	11%	28.39	-5.8	3.0
SEP	207.4	246.28	12.3	26.6	13%	28.39	-1.8	7.0
OCT	204.0	246.28	5.6	36.7	18%	28.39	8.3	17.1
NOV	211.9	246.28	5.5	28.9	14%	28.39	0.5	9.3
DEC	207.9	246.28	5.8	32.6	16%	28.39	4.2	13.0