January 31, 2022

The Honorable Chair and Members
of the Hawai‘i Public Utilities Commission
Kekuanao‘a Building, First Floor
465 South King Street
Honolulu, Hawai‘i 96813

Dear Commissioners:

Subject: Adequacy of Supply Report
Maui Electric Company, Limited

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.*

2022 Adequacy of Supply Report Summary

- Maui Electric Company, Limited's ("Maui Electric" or the "Company") 2022 Adequacy of Supply employs the Energy Reserve Margin criteria, developed to review adequacy of supply in all hours of the year vs. during the peak hour of the day or peak day of the year, and incorporates the reliability contribution of variable and energy-limited resources, such as energy storage, and duration limited grid services, such as demand response resources.
- For the island of Maui, Energy Reserve Margin criteria shortfalls occur in 2022 and 2023. Energy Reserve Margin is satisfied from 2024 through 2026 with the addition of planned generation and storage resource additions. New resources planned for Maui are anticipated to meet the Energy Reserve Margin to allow for the retirement of Kahului Power Plant.
- For the island of Lāna‘i, Energy Reserve Margin shortfalls occur in 2023, 2025 and 2026.

- For the island of Moloka‘i, Energy Reserve Margin is satisfied for the next five years 2022 through 2026.
- The peak load experienced on Maui in 2021 was 193.4 MW-net and was served by Maui Electric’s total capability of 246.3 MW-net not including variable generation sources such as wind and solar.[1] This represents a firm generating reserve margin of approximately 27% over the 2021 net system peak.
- The peak load experienced on Lāna‘i in 2021 was 6.11 MW-gross, and was served by Lāna‘i’s total capability of 9.40 MW-gross, not including variable generation sources. This represents a reserve margin of approximately 54% over the 2021 system peak.
- The peak load experienced on Moloka‘i in 2021 was 5.80 MW-gross, and was served by Moloka‘i’s capability of 12.01 MW-gross not including variable generation sources. This represents a reserve margin of approximately 107% over the 2021 system peak.

1.0 Maui’s Peak Demand and System Capability in 2021

Maui’s 2021 system peak occurred on Wednesday, November 17, 2021, at approximately 6:30 p.m. and was 193.4 MW (net) or 197.6 MW (gross). During the peak, wind resources provided approximately 10.8 MW and there was no solar output.

At the time of the system peak, Maui had a firm generating reserve margin of approximately 27% over the 2021 system peak. This calculation does not include any variable generation wind and solar resources or demand response.

1.1 Rider M

At the time of system peak, Maui had in place nine load management contracts totaling approximately 4.1 MW under Rider M, which reduced the evening peak by approximately 2.4 MW-net.

2.0 Criteria to Evaluate Maui Electric’s Adequacy of Supply

Maui Electric’s capacity planning criteria are applied to determine the adequacy of supply – whether or not there is enough generating capacity on the system. Maui Electric’s capacity planning criteria take into account that the Company must provide for its own backup generation since, each island within its service territory cannot import emergency power from a neighboring utility.

The function of a planning criteria is to establish guidelines to manage the risk of insufficient generation capability from a diverse mix of generating resources available to

[1] Refer to Attachment 1, Table A1 for details of firm generating units.

the system in long-range generation expansion studies. Resource plan development is evaluated based on a consistent guideline or criteria to provide adequate generation to meet customer demand, with reasonable reserves to account for routine maintenance or overhauls of units, unexpected outages of generating units, growth in customer demand over time, and possibilities of higher than forecasted instantaneous peak demand.

With the increasing quantities of variable renewable wind and solar resources, and future energy storage additions to the system, an Energy Reserve Margin criteria was developed considering the dynamic nature of variable resources and limited duration storage.[2] For the purposes of this adequacy of supply report, Maui Electric used these planning criteria.

2.1 Energy Reserve Margin:

The Energy Reserve Margin is the percentage which the system capacity must exceed the system load in each hour for planning objectives. With the increasing quantities of variable renewable wind and solar resources, this capacity planning criteria is intended to account for current and future variable generation resources considering the dynamic nature of energy provided by wind, PV and implications of limited duration storage. The hourly evaluation of available energy allows for statistical representation of the impact of variable and finite resources at all hours of the day in the assessment of energy margins. The Energy Reserve Margin for Maui is 30%, to provide reasonable reliability reserve to address some level of contingencies, forecast errors, and uncertainties inherent in the assumptions and methodology.

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 Maui Electric consider additional factors to ensure timely installation of generation capacity necessary to meet its customers' energy needs.

Other near-term considerations may include:

1. The current condition and rated capacity of existing units;
2. The preferred mix of generation resources to meet varying daily and seasonal demand patterns at the lowest reasonable capital and operating costs;

[2] Refer to Appendix C (page 102) of Hawaiian Electric's Integrated Grid Planning Grid Needs Assessment & Solution Evaluation Methodology filed November 5, 2021: https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/20211105_grid_needs_assessment_methodology_review_point_book_1.pdf

3. Required power purchase obligations and contract terminations;
4. The uncertainties surrounding Non-Utility Generation resources;
5. Transmission system considerations;
6. Meeting environmental compliance standards; and
7. System stability considerations for Maui Electric's isolated system.

While meeting the planning criteria implies a reasonable adequacy of supply, it is not equivalent to a guaranteed supply. As firm capacity resources are displaced to accommodate variable renewable energy, resource planning may need to include resource characteristics to mitigate adequacy of supply risks by having large amounts of offline reserves. This may include consideration of minimum fast-start capability and/or means to curtail demand on short notice.

3.0 Key Inputs to the 2022 Adequacy of Supply Analysis

In the application of Maui Electric's capacity planning criteria, the inputs drive the results. Key inputs are described in the following sections.

3.1 Period Under Review

This adequacy of supply review covers the period 2022 to 2026.

3.2 June 2021 Sales and Peak Forecast

In June 2021, a sales and peak forecast ("June 2021 S&P forecast") was developed which was subsequently approved by the Company for future planning purposes and used for this analysis.

The June 2021 S&P forecast began with the development of the energy forecast (i.e., sales forecast) by rate class (residential, small, medium and large commercial and street lighting) and by layer (underlying load forecast and adjusting layers – energy efficiency, distributed energy resources, and electrification of transportation). The underlying load forecast is driven primarily by the economy, weather, electricity price, and known adjustments to large customer loads and is informed by historical data, structural changes, and historical and future disruptions. The impacts of energy efficiency ("EE"), distributed energy resources ("DER"), primarily photovoltaic systems with and without storage (i.e., batteries), and electrification of transportation (light duty electric vehicles ("EV") and electric buses ("eBus"), collectively "EoT") were layered onto the underlying sales outlook to develop the sales forecast at the customer level.

The sales and peak forecasts used for the analysis herein is the result of the methodology described above and the continued impacts of the COVID-19 pandemic. In 2021, the COVID-19 pandemic continued to disrupt global travel, local resident behavior, economic activity and as a result, electricity consumption, with improvements resulting from the widespread distribution of vaccines. Electricity usage continued to be impacted, although in different ways depending on the sector. The economic outlook from the University of Hawai‘i Economic Research Organization ("UHERO") shows continued recovery in key economic drivers (i.e., visitor arrivals and jobs) but a return to pre-pandemic levels does not occur in the forecast period.

The forecast is the result of the above described contributing factors and reflects the Company's most current outlook for customer energy demand for the next five years.

In addition, a high weather peak scenario forecast was used in the analysis to show asymmetric risks associated with unusual events that could occur in future years. Maui Electric has in past years experienced significantly higher peak loads than forecasted primarily due to unusually high temperature and humidity conditions. To evaluate the potential risk associated with higher peaks due to unusual conditions such as high temperature and humidity, a high weather peak scenario forecast was created. Historical weather data was used to define a 1 in 30 high temperature and humidity weather condition for the island of Maui. A regression model was used to derive the peak impact of the 1 in 30 weather condition, which is reflected in the high weather peak scenario forecast.

Figure 1 and Table 1 below illustrate Maui's historical system peaks and compares them to the forecast used in the 2021 analysis.

For both the recorded and forecast data, Table 1 includes the peak reduction benefits of energy efficiency programs and naturally occurring conservation.

Figure 1: Recorded Peaks and Future Year Projections

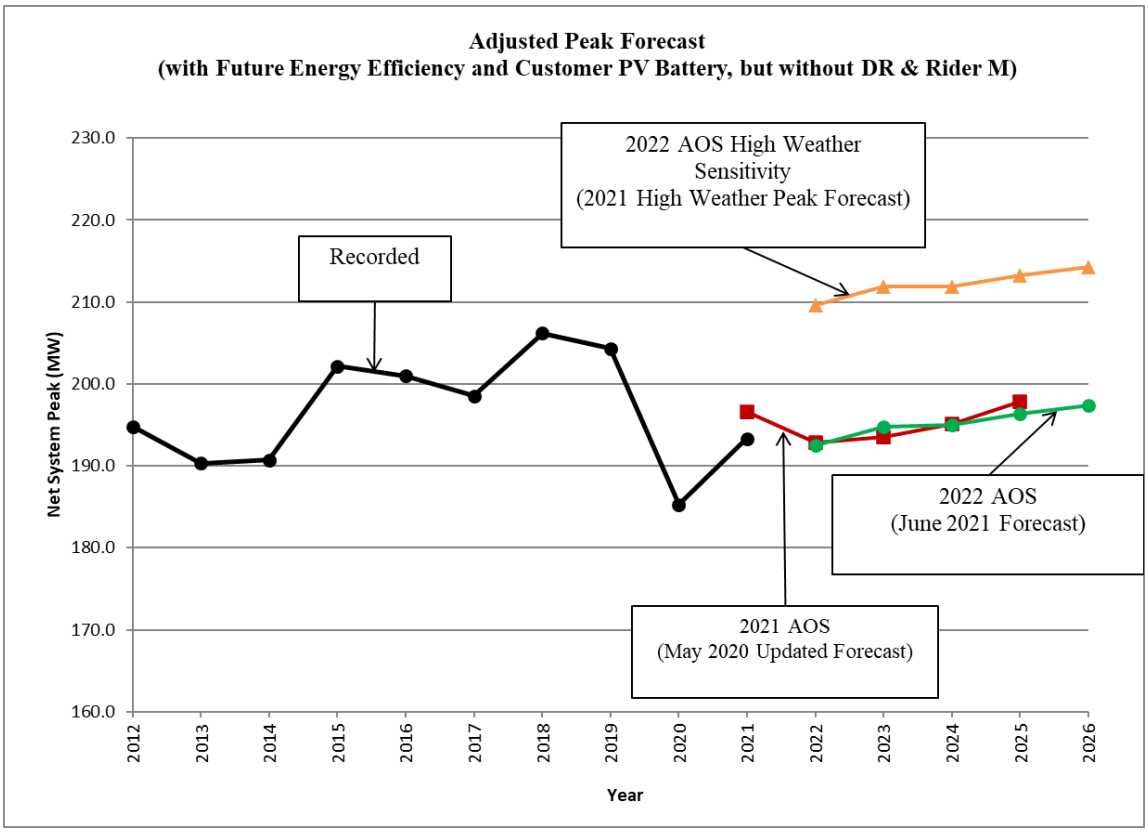

Table 1: Recorded Peaks and Future Year Projections
Net System Peak[3] (MW)

Year	Actual Net-to-System	May 2020 Updated Peak Forecast	June 2021 Peak Forecast without Emergency Demand Response	2021 High Weather Peak Forecast
2012	194.8			
2013	190.3			
2014	190.7			
2015	202.2			
2016	201.0			
2017	198.5			
2018	206.2			
2019	204.3			
2020	185.3			
2021	193.4	196.6		
2022		192.9	192.5	209.6
2023		193.5	194.8	211.9
2024		195.1	195.0	211.9
2025		197.8	196.4	213.3
2026			197.4	214.3

3.3 Projected Peak Reduction Benefits of Demand Response Programs

Maui Electric is committed to pursuing demand response ("DR") programs designed to provide cost-effective resource options as identified in the Hawaiian Electric Companies' Integrated Demand Response Portfolio Plan.[4]

In 2015, the Hawaiian Electric Companies submitted to the Commission for approval a DR Portfolio Application in Docket No. 2015-0412. In 2016, Maui Electric filed an application seeking to expand its Fast DR Program from 0.2 MW to 5.0 MW ("Fast DR Expansion Application").[5] A Revised DR Portfolio filing was filed on February 10, 2017, which provided modified approval requests and

[3] The May 2020 updated peak forecast and the June 2021 peak forecast include ~3 MW of standby load.
[4] Refer to Docket No. 2007-0341.
[5] See Application filed in Docket No. 2016-0232.

DR program design and targets following consistent with the DR Portfolio used in PSIP Update Report filing on December 23, 2016. On January 25, 2018, the Commission issued Decision and Order No. 35238, approving the Companies' Revised DR Portfolio tariff structure framework.

The Commission supported the approach of working with aggregators to implement the DR portfolio. In 2019 and 2020, the utilities signed a multi-year Grid Services Purchase Agreement ("GSPA") with a third party aggregator. Currently, the Companies are implementing three GSPA contracts that were approved by the Commission on August 9, 2019 and December 31, 2020. Customer enrollment under these GSPA contracts have been delayed by the COVID-19 pandemic, but the Companies are diligently working with the aggregators to catch up in 2022. For the purposes of the analysis, Maui Electric's adequacy of supply was calculated with forward looking peak reduction benefit from Fast DR and the GSPA for Maui. The DR impacts in Table 2 lists the peak reductions from 5:00 PM to 9:00 PM forecasted for 2022. Peak reductions for 2023 to 2026 are assumed to be the same as 2022 as a conservative estimate.

Table 2: DR Peak Reduction

Year	DR Peak Reduction Impacts (MW-Net)
2022	4.9
2023	4.9
2024	4.9
2025	4.9
2026	4.9

3.4 Planned Maintenance Schedules for the Generating Units on the System

Planned overhaul and maintenance outages reduce generating unit availabilities. The schedules for planned overhaul and maintenance outages change frequently due to unforeseeable findings during outage inspections or to changes in priorities due to unforeseeable problems or circumstances. When major revisions to planned and/or maintenance outages occur, the Planned Maintenance Schedule is revised. The Planned Maintenance Schedule used in this analysis was updated on January 3, 2022.

3.5 Reductions of Firm Generating Capacity

3.5.1 Kahului Power Plant

Maui Electric is planning to convert two of its Kahului Power Plant generating units to synchronous condensers and retire two units in the 2024 timeframe.[6] For the purposes of this analysis, Kahului unit 3 is assumed to be unavailable from January 2024 and Kahului unit 4 is assumed to be unavailable from April 2024 due to their conversion from generators to synchronous condensers. Kahului units 1 and 2 are assumed to retire at the end of November 2024.

3.6 Resource Additions

In January 2017, the Company filed a letter with the Commission requesting to open a docket to solicit proposals for new renewable dispatchable generation. The Commission subsequently issued Order No. 34856 and opened Docket No. 2017-0352 to receive filings, review approval requests, and resolve disputes, if necessary, related to the plan to proceed with competitive procurement of this generation. Request for Proposals ("RFP") for the above docket were separated into two stages, Stage 1 and Stage 2.

Maui Electric's renewable RFP Stage 1 AES Kuihelani Solar (Docket No. 2018-0436) project is included in this analysis. Maui Electric's renewable RFP Stage 2 projects – Pulehu Solar (Docket No. 2020-0141), Kahana Solar (Docket No. 2020-0142) and Kamaole Solar (Docket No. 2021-2026), are also included in this analysis. The Paeahu Solar (Docket No. 2018-0433) project's overhead line application is supended, and therefore, the project is not included in this analysis. The Waeana BESS project (Docket No. 2020-0132) is under Commission review and is not included in this analysis.

Maui CBRE phase 1 project ROIZ is included in this analysis.

4.0 Results of Analysis

4.1 Description of Scenarios

For the Energy Reserve Margin analysis, three scenarios were analyzed. These scenarios include the planned Stage 1 and Stage 2 variable renewable resources described in Section 3.6. and the third scenario also includes the high weather peak forecast.

[6] See Docket No. 2020-0167, Maui Electric's Switchyard/Synchronous Condenser Project.

The Moderate scenario takes the expected commercial operations dates of the Stage 1 and Stage 2 projects, and for some of the projects, slightly delayed them by 1 to 6 months. While the projects are expected to meet their commercial operations dates, for planning purposes, some dates were adjusted in light of the ongoing pandemic and global supply chain issues.

For the Conservative scenario, some of the expected commercial operations dates of the Stage 1 and Stage 2 projects were delayed by 6 months or longer. In addition, the Pulehu Solar project was excluded from this scenario. This was intended to be a more conservative scenario to consider potentially more significant or prolonged impacts from the ongoing pandemic and global supply chain issues.

The High Weather scenario is the same as the Moderate scenario, except it includes the high weather peak forecast.

The Mitigations scenario is the same as the Moderate scenario, except it includes additional grid services described in section 5.1 and temporary distributed generation which is described in section 5.2. For the purpose of this scenario it is assumed that temporary distributed generation becomes operational in July 2023.

4.2 Energy Reserve Margin

The results of the Energy Reserve Margin analysis are shown in Table 3.

In the Moderate scenario, Energy Reserve Margin criteria shortfalls occur in 2022 and 2023. Energy Reserve Margin is satisfied from 2024 through 2026 with the addition of planned generation and storage resource additions. However, in the Conservative scenario, the Energy Reserve Margin is not achieved from 2024 to 2026.

In the High Weather scenario, the Energy Reserve Margin is not satisfied in 2022, 2023 and 2026. Future peaks are highly uncertain, as such Maui Electric plans to adjust maintenance schedules throughout the year, to the extent possible, to mitigate shortfalls.

In the Mitigations scenario, the Energy Reserve Margin increases from 4% to 10% in the years 2023 through 2026. In particular the energy margin shortfall hours is reduced to 5 in 2023 in comparison to 65 without the mitigations.

Table 3: Maui Estimated Energy Reserve Margin Shortfall Hours

Number of Hours Below Energy Reserve Margin Target (Pass/Fail 30% Criteria)				
Year	Moderate Scenario	Conservative Scenario	High Weather Scenario	Mitigations Scenario
2022	70 (FAIL)	70 (FAIL)	97 (FAIL)	70 (FAIL)
2023	65 (FAIL)	86 (FAIL)	82 (FAIL)	5 (FAIL)
2024	0 (PASS)	140 (FAIL)	0 (PASS)	0 (PASS)
2025	0 (PASS)	45 (FAIL)	0 (PASS)	0 (PASS)
2026	0 (PASS)	35 (FAIL)	3 (FAIL)	0 (PASS)

Table 4: Maui Estimated Energy Reserve Margin Percentage

Lowest Estimated Hourly Energy Reserve Margin Percentage				
Year	Moderate Scenario	Conservative Scenario	High Weather Scenario	Mitigations Scenario
2022	20%	20%	18%	20%
2023	24%	22%	14%	28%
2024	38%	12%	34%	46%
2025	38%	24%	36%	48%
2026	34%	22%	28%	42%

5.0 Mitigation Measures

Maui Electic recognizes a need to implement various measures on Maui to improve its energy reserve margin and to allow for the retirement of Kahului Power Plant. As a result, Maui Electric has taken a portfolio approach, considering a variety of mitigation measures.

5.1 Additional Grid Services

The Company’s Customer Energy Resourses group will develop a new RFP and GSPA contract from the recent lessons learned from O‘ahu and Hawai‘i Island. The Company will submit a request to proceed with an RFP for 30 MW of capacity load reduction (5:00 – 9:00pm) to the Commission by Q1 2022. Pending

the actual selection of bidders, the Company assumes grid services availability of 7 MW for 2023 and 15 MW for 2024.

5.2 Temporary Distributed Generation

Maui Electric's application to purchase and install approximately 4.95 MW of temporary distributed generation ("Temp DG") remains suspended.[7] However, the Company believes Temp DG is the lowest risk alternative to supplemental DR capacity in the near-term. Temp DG units can be operational in six months or less, and provide a high level of dependable capacity, relative to the other options available to Maui Electric.

Should the Company decide to pursue Temp DG units as a solution, leasing the units may be the preferred option (versus buying and later selling the units as originally proposed in the Temp DG application). Provided units are available, leasing removes the uncertainty of the future sale price of the units and may also alleviate stakeholder concerns regarding the permanence of the units.

5.3 Refinement of Maintenance Schedule

Maui Electric's normal maintenance scheduling practices are performed by the Maui Electric Generation Division. Scheduling involves many different operational factors. Maintenance scheduling can be expected to be adjusted numerous times over the year due to changing operational factors. In the event of reserve capacity shortfalls, rearranging maintenance schedules, to the extent possible, may provide some level of mitigation

5.4 Waena Battery Energy Storage System

The Waena Battery Energy Storage System provides sufficient capacity to allow for the retirement of Kahului Power Plant. For example, in the scenario reflecting alternate installs with future generation and storage resources, the Energy Reserve Margin criteria would be satified when the Waena Battery Energy Storage System reaches commercial operation.

5.5 Paeahu Solar

Paeahu Solar would help to reduce the Energy Reserve Margin shortfalls in the Alternate scenario and Extreme Weather Forecast scenario. With the overhead line proceeding currently suspended, Paeahu Solar may start commercial

[7] See Order No. 34437 Suspending the Docket, issued on March 9, 2017 in Docket No. 2016-0234.

operations after the retirement period of Kahului Power Plant assumed in this analysis.

5.6 Continued Operation of Kahului Power Plant

The retirement of Kahului Power Plant requires sufficient replacement capacity in operation to ensure system reliability. As a last resort, the Kahului units will remain in operation until electric demand can be reliably satisfied without the Kahului units.

5.7 Call for Conservation

Maui Electric may request voluntary customer curtailment of demand during capacity reserve shortfall conditions. However, because this is strictly voluntary, and the Company has no direct control in the implementation of this measure, it should not be considered as dependable as other measures such as demand response. Also, the potential benefit of this option is likely to reduce over time, as increased customer participation in demand response programs becomes more common.

6.0 Lāna‘i Division

6.1 Peak Demand and System Capability in 2021

Lāna‘i’s 2021 system peak of 6,110 kW (gross) occurred on February 18, 2021 (6:50 p.m.). The total system capability of Lāna‘i was 9,400 kW-gross at the time of the system peak resulting in a reserve margin of approximately 53% over the 2021 system peak.

At times during 2021, Lāna‘i received energy from Lanai Sustainability Research, LLC (“LSR”), a PV independent power producer. Since the power purchase contract with LSR is not for firm capacity, it is not reflected in Lāna‘i’s total firm generating capability.

Maui Electric’s combined heat and power system that was located at the Manele Bay Four Seasons Resort was retired in 2021. The generating unit of the system was stored at Miki Basin, but not connected to the grid. For the purposes of this analysis, the combined heat and power unit was not included. The total system capability for Lāna‘i is 9,400 kW to reflect no combined heat and power unit.

Maui Electric developed and adopted its peak forecast in June 2021 that was used in this analysis for Lāna‘i.

6.2 Lāna‘i Division Capacity Planning Criteria

The Energy Reserve Margin for Lāna‘i is 60% to provide reasonable reliability reserves to address some level of contingencies, forecast errors, and uncertainties inherent in the assumptions and methodology.

6.3 Lāna‘i Division Results of Analysis

6.3.1 Energy Reserve Margin Results

The results of the Energy Reserve Margin criteria analysis are shown in Table 7.

Table 7: Lāna‘i Estimated Energy Reserve Margin Shortfall Hours

Year	Number of Hours Below Energy Reserve Margin Target (Pass/Fail 60% Criteria)
2022	0 (PASS)
2023	371 (FAIL)
2024	0 (PASS)
2025	104 (FAIL)
2026	121 (FAIL)

Table 8: Lāna‘i Estimated Energy Reserve Margin Percentage

Year	Lowest Estimated Hourly Energy Reserve Margin Percentage
2022	60%
2023	30%
2024	60%
2025	30%
2026	30%

In 2023, 2025 and 2026 the larger 2,200 kW units on Lāna‘i are taken offline for maintenance resulting in Energy Reserve Margin criteria shortfalls for those years.

6.4 Mitigation Measures

Mitigation measures and additional resources are needed for Lana‘i to meet its Energy Reserve Margin criteria.

6.4.1 Refinement of Maintenance Schedule

Maui Electric's normal maintenance scheduling practices are performed by the Maui Electric Generation Division. Scheduling involves many different operational factors. Maintenance scheduling can be expected to be adjusted numerous times over the year due to changing operational factors. In the event of reserve capacity shortfalls, rearranging maintenance schedules, to the extent possible, may provide some level of mitigation

6.4.2 Lāna‘i Request for Proposals ("RFP")

The Lāna‘i RFP seeks to add photovoltaic paried with battery energy storage projects.[8] These projects would allow Lāna‘i to meet its Energy Reserve Margin criteria. The RFP requires project proposals to have a guaranteed commercial operations date no later than August 31, 2025. The RFP is currently open and accepting proposals.

6.4.3 Call for Conservation

Maui Electric may request voluntary customer curtailment of demand during capacity reserve shortfall conditions. However, because this is strictly voluntary, and the Company has no direct control in the implementation of this measure, it should not be considered as dependable as other measures such as demand response.

7.0 Moloka‘i Division

7.1 Peak Demand and System Capability in 2021

Moloka‘i's 2021 system recorded peaks of 5,800 kW (gross) on November 15 (6:48 p.m.). The total system capability on Moloka‘i was 12,010 kW-gross at the time of the system peak, resulting in a reserve margin of approximately 107% over the 2021 system peak.

Maui Electric developed and adopted its peak forecast in June 2021 that was used in this analysis for Moloka‘i.

[8] See November 22, 2021 Filing in Docket No. 2015-0389, Community-Based Renewable Energy.

7.2 Moloka‘i Division Capacity Planning Criteria

The Energy Reserve Margin for Moloka‘i is 60% to provide reasonable reliability reserves to address some level of contingencies, forecast errors, and uncertainties inherent in the assumptions and methodology.

7.3 Moloka‘i Division Results of Analysis

7.3.1 Energy Reserve Margin Results

The results of the Energy Reserve Margin criteria analysis are shown in Table 11. The Energy Reserve Margin criteria for Moloka‘i is satisfied in the years 2022 to 2026.

Table 11: Moloka‘i Estimated Energy Reserve Margin Shortfall Hours

Year	Number of Hours Below Energy Reserve Margin Target (Pass/Fail 60% Criteria)
2022	0 (PASS)
2023	0 (PASS)
2024	0 (PASS)
2025	0 (PASS)
2026	0 (PASS)

Table 12: Moloka‘i Estimated Energy Reserve Margin Percentage

Year	Lowest Estimated Hourly Energy Reserve Margin Percentage
2022	130%
2023	150%
2024	150%
2025	140%
2026	180%

7.4 Reductions in Peak Demand: Moloka‘i’s Rider M

At the time of system peak, Moloka‘i had in place one load management contract totaling approximately 366 kW under Rider M, which reduced evening peak by approximately 360 kW.

8.0 Conclusion

The Maui Division’s Energy Reserve Margin shortfalls occur in 2022 and 2023. Energy Reserve Margin is satisfied from 2023 through 2025 with the addition of planned generation and storage resource additions. New resources planned for Maui are anticipated to meet energy reserve margin targets to mitigate the retirement of Kahului Power Plant.

The Lāna‘i’ Division’s Energy Reserve Margin shortfalls occur in 2023, 2025 and 2026.

The Moloka‘i’ Division’s Energy Reserve Margin is satisfied for the next five years 2022 through 2026.

Maui Electric recognizes that the environment for resource planning has increased in complexity and uncertainty. Nonetheless, Maui Electric will continue its portfolio approach to meet its obligation to serve, which includes increased renewable energy contributions, energy storage resources, the pursuit of supply side options, and customer program options, as well as continuing to consider other potential options.

Sincerely,

/s/ Kevin M. Katsura

Kevin M. Katsura
Director
Regulatory Non-Rate Proceedings

Attachment

c: Division of Consumer Advocacy (with Attachment)

Table A1:

Maui Unit Ratings Installed
As of December 31, 2021

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
Hana 1(III)	1.00	1.00	0.97	0.97
Hana 2(III)	1.00	1.00	0.97	0.97
Maui System	251.70	248.10	246.28	242.69

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). Maui Electric 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) Units located at Hana Substation No. 41.

The foregoing document was electronically filed with the State of Hawaii Public Utilities Commission's Document Management System (DMS).