



January 28, 2019

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2019 JAN 28 P 3:49

PUBLIC UTILITIES
COMMISSION

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The Honorable Chair and Members of the
Hawai'i Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Hawaiian Electric Companies
2018 Net Energy Metering Status Report

Hawaiian Electric Company, Inc., Hawai'i Electric Light Company, Inc. and Maui Electric Company, Limited respectfully submit their 2018 Net Energy Metering Status Report, which provides the total number of installations and the total rated generating capacity of net metered customer facilities in each of their service territories.

Sincerely,

Kevin M. Katsura
Director
Regulatory Non-Rate Proceedings

Attachment

c: Division of Consumer Advocacy

Net Energy Metering Status Report

Hawaiian Electric Company, Inc.
Hawai'i Electric Light Company, Inc.
Maui Electric Company, Limited

FILED

December 31, 2018

2019 JAN 28 P 3 49

Status

The following table provides the status of NEM in the Hawaiian Electric, Hawai'i Electric Light, and Maui Electric service territories as of December 31, 2018. In addition, a report on the estimates of the rate and revenue impact of NEM participation is shown in Appendix A.

PUBLIC UTILITIES
COMMISSION

NEM Status as of 12/31/18

	Information packets sent	No. of Installations ¹	Installed kW ²	NEM System Cap, ³ kW
Hawaiian Electric				
2001	151	1	3.60	5,955
2002	12	1	2.06	6,020
2003	49	8	11.74	6,210
2004	15	3	7.90	6,405
2005	5	0	0	6,150
2006	23	10	74.28	6,330
2007	67	73	400.29	6,080
2008	132	220	2,361	11,860
2009	111	513	2,460	12,130
2010	*	1,327	7,267	11,620
2011	*	3,424	18,518	N/A
2012	*	8,623	52,504	N/A
2013	*	14,010	83,659	N/A
2014	*	6,830	46,242	N/A
2015	*	6,193	44,769	N/A
2016	*	4,709	40,902	N/A
2017	*	1,855**	22,707**	N/A
2018	*	370	3,892	
Total Hawaiian Electric	565	48,170	325,781	N/A

¹ Completed systems (i.e., NEM Agreements completed).

² Installed kW reflects rated generating capacity installed in the year noted. Includes system expansions.

³ In 2011 the three companies NEM cap is based on individual circuit capacity and not total system capacity, therefore this metric is no longer applicable (N/A) from 2011 on. Prior system caps as follows: Hawaiian Electric - 0.5% of system peak in 2001-2007, 1.0% of system peak in 2008-2010. Hawai'i Electric Light, Maui Electric - 0.5% of system peak in 2001-2007, 3% of system peak in 2008-2009, and 4% system peak 2010. System Peak is defined as Net System Peak for Hawaiian Electric, Hawai'i Electric Light, and Maui Electric-Maui only and Gross System Peak for Maui Electric-Molokai and Maui Electric-Lanai.

Net Energy Metering Status Report

Hawaiian Electric Company, Inc.
Hawai'i Electric Light Company, Inc.
Maui Electric Company, Limited

December 31, 2018

NEM Status as of 12/31/18 (cont.)

	Information packets sent	No. of Installations ¹	Installed kW ²	NEM System Cap. ³ kW
Hawai'i Electric Light				
2001	122	2	10.20	871
2002	25	3	4.73	890
2003	13	6	28.00	934
2004	12	4	8.84	972
2005	17	10	58.27	985
2006	12	34	299.57	1,007
2007	24	35	263.15	1,017
2008	23	116	783.80	5,946
2009	30	265	2,063.58	5,838
2010	*	371	2,287.85	7,624
2011	*	804	4,522.31	N/A
2012	*	1,734	9,943	N/A
2013	*	1,952	12,442	N/A
2014	*	2,080	13,046	N/A
2015	*	2,210	14,224.4	N/A
2016	*	1,298	9,621	N/A
2017	*	209	3,420	N/A
2018	*	15	817	
Total Hawai'i Electric Light	278	11,148	73,844	N/A

Net Energy Metering Status Report

Hawaiian Electric Company, Inc.
Hawai'i Electric Light Company, Inc.
Maui Electric Company, Limited

December 31, 2018

NEM Status as of 12/31/18 (cont.)

	Information packets sent	No. of Installations ¹	Installed kW ²	NEM System Cap. ³ kW
Maui Electric				
2001	49	2	8.20	993
2002	19	5	8.80	1,006
2003	24	3	13.00	1,047
2004	29	8	21.60	1,091
2005	22	16	92.15	1,068
2006	49	50	233.47	1,091
2007	13	64	359.81	1,081
2008	15	135	947	6,171
2009	0	298	2,336	6,317
2010	*	342	1919	8,397
2011	*	1,039	6,624.22	N/A
2012	*	1,677	10,981	N/A
2013	*	1,566	11,202	N/A
2014	*	1,901	12,832	N/A
2015	*	2,207	17,025	N/A
2016	*	1,791	15,408	N/A
2017	*	394**	5,613**	N/A
2018	*	104	1,682	
Total Maui Electric	220	11,602	87,306	N/A
TOTAL	*	70,920	486,931	

* NEM information and forms are made available on the web and therefore, not tracked for the respective Companies.

** The Number of Installations and the Installed kW are annually adjusted to reflect updates such as modifications to system capacity ratings, agreement execution dates, number of installations, additions to existing systems, changes in rate schedules, and subsequent accounting reconciliations. All accounting reconciliations are trued up in the preceding year (2017) totals only to reflect accurate annual and cumulative numbers in the filing year.

APPENDIX A

Per the Commission's request, the attached pages are included to provide illustrative estimates of lost contributions to fixed cost in 2019 and the associated estimated value per kWh, based on estimated annualized kWh production of NEM installations in place as of year-end 2018. The value shown in these illustrations represents the estimated amount from all installations since the inception of the NEM program. For the calculation of lost contribution to fixed costs, the Base Energy Rates and Production Energy Rates for Maui, Lana'i, and Moloka'i are unchanged from last year's report. For the calculation of lost contribution to fixed costs, the Base Energy Rates and Production Energy Rates for Hawaiian Electric and Hawai'i Electric Light have changed based on the final Decision and Orders in the Hawaiian Electric 2017 test year rate case (Docket No. 2016-0328) and in the Hawai'i Electric Light 2016 test year rate case (Docket No. 2015-0170), respectively. For all Companies, the effective Purchased Power Adjustment Clause rates reflect the January 2019 values. The calculation for lost contribution to fixed cost includes the impact of surcharges for the residential and commercial demand-side management programs, for the renewable energy infrastructure programs, and for the recovery of the Rate Adjustment Mechanism Provision portion of the Revenue Balancing Account Rate Adjustment. For Maui, Lanai, and Molokai the calculation for lost contribution to fixed cost also includes the 2018 interim rate increase percent by rate class. Lost contributions to fixed cost related to the Purchased Power Adjustment Clause, to the demand-side management surcharges, to the renewable infrastructure surcharge, and to the Rate Adjustment Mechanism Provision portion of the Revenue Balancing Account Rate Adjustment are reflected in subsequent reconciliations of these surcharges and are eventually borne by customers who incur per kWh charges. Some of the lost contribution amount related to base energy rates may already be reflected in rates through past utility rate cases or through current decoupling rate adjustments. Any remaining lost contributions to fixed cost for base energy rates have no bill impact unless and until the utilities propose and receive Commission approval to adjust rates. At that point, any rate adjustment would apply to all customers, including customers with NEM installations.

Hawaiian Electric Company

Estimated Lost Contribution to Fixed Costs and Surcharges, based on NEM installations as-of December 31, 2018

Rate	Total Lost kWh/yr ¹	Base Energy Rate ² cents/kWh	Eff. PPAC ³ cents/kWh	REIP & DSM ⁴ cents/kWh	RAM ⁴ cents/kWh	Eff. Base Energy Rate cents/kWh	Production Energy Rate ⁵ cents/kWh	Lost Contribution to Fixed Cost, cents/kWh	Total Lost Contribution to Fixed Cost, \$/Yr
	A	B	C	D	E	F= sum(B:E)	G	H= F- G	I = A * H / 100
R	421,709,191	21.4437	3.0574	0.0203	0.2109	24.7323	11.9950	12.7373	\$53,714,365
G	14,667,373	19.8291	3.4774	-0.0006	0.2109	23.5168	12.0340	11.4828	\$1,684,225
J	87,097,660	15.5455	3.0807	-0.0006	0.2109	18.8365	12.1020	6.7345	\$5,865,592
P	1,223,654	13.1478	2.6836	-0.0006	0.2109	16.0417	12.0010	4.0407	\$49,444
Total	524,697,678								\$61,313,626

Rate	Total Lost Contribution to Fixed Cost, \$/Yr	Forecast 2019 Sales ⁶ kWh/yr	Estimated Impact on Rates, ¢/kWh
	K = I	L	M = (K / L) * 100
R	\$53,714,365		
G	\$1,684,225		
J	\$5,865,592		
P	\$49,444		
Total	\$61,313,626		
Total Company		6,512,700,000	0.94

Notes:

- 1 See Appendix A, page 3, column H.
- 2 Source: Base Energy Rates from Docket 2016-0328 (HECO 2017 Test Year)
 - sched R: Docket 2016-0328 (HECO 2017 Test Year); Final revised tariffs, Exhibit 2, Attachment 1, page 23, filed July 23, 2018.
 - sched G: Docket 2016-0328 (HECO 2017 Test Year); Final revised tariffs, Exhibit 2, Attachment 1, page 43, filed July 23, 2018.
 - sched J: Docket 2016-0328 (HECO 2017 Test Year); Final revised tariffs, Exhibit 2, Attachment 1, page 77, filed July 23, 2018.
 - sched P: Docket 2016-0328 (HECO 2017 Test Year); Final revised tariffs, Exhibit 2, Attachment 1, page 119, filed July 23, 2018.
- 3 PPAC Rates Effective January 2019
- 4 REIP and DSM rate from effective rate summaries for January 2019, RAM based on Decoupling Transmittal No. 18-01 filed on March 29, 2018, Decoupling Calculation workbook, Schedule A, page 1
- 5 Source: Cost-of-service calculation, from Docket 2016-0328 (HECO 2017 Test Year); Final D&O, exhibit 3, page 80.
- 6 Sales from 2019 Revenue Budget Forecast.

Hawaiian Electric Company

Estimated kW and kWh by technology and rate schedule

Rate	NEM kW Installed by Technology				NEM kWh Installed by Technology			
	PV kW NEM installed (Cumulative Dec 31, 2018) NEM ^A	Wind kW NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kW NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kW	PV kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^{A,B,D}	Wind kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kWh
	A	B	C	D= sum(A:C)	E	F	G	H= sum(E:G)
R	260,769	1	0	260,770	421,706,651	2,540	0	421,709,191
G	9,354	4	0	9,358	14,657,211	10,162	0	14,667,373
J	54,880	20	0	54,900	87,046,852	50,808	0	87,097,660
P	753	0	0	753	1,223,654	0	0	1,223,654
Total	325,756	25	0	325,781	524,634,368	63,510	0	524,697,878

Source: Grid Technologies Department.

^A NEM PV/wind/hydro kW data from respective 2018 utility detailed year end spreadsheets. HECO 2014 cumulative data used to breakout PTC/inverter kW counting method.

^B Adjustment made to account for PV conversion from PTC (PVUSA Test Conditions) to STC (Standard Test Conditions) by dividing by a factor of 0.89.

PTC to STC conversion factor of 0.89 is an average calculated from GoSolarCalifornia.org web site.

(For HECO prior to 2016, PV NEM capacity (kW) is PTC or inverter rating whichever is lower. For 2016 and beyond PV kW is STC or inverter rating whichever is lower), Multiply by hours in year-8760.

^D PV capacity factor of 17% (Based on PV benchmarking developed by E3 for FIT pricing (Docket No 2008-0273, page 20).

^E Wind capacity factor 29% .

Hawai'i Electric Light

Estimated Lost Contribution to Fixed Costs and Surcharges based on NEM Installations as-of December 31, 2018

Rate	Total Lost kWh/yr ¹	Base Energy Rate ² , cents/kWh	Eff. PPAC ³ , cents/kWh	REIP & DSM ⁴ , cents/kWh	RAM ⁴ , cents/kWh	Total Eff. Base Energy Rate, cents/kWh	Production Energy Rate ⁵ , cents/kWh	Lost Contribution to Fixed Cost, cents/kWh	Total Lost Contribution to Fixed Cost, \$/Yr
	A	B	C	D	E	F = sum(B:E)	G	H = F - G	I = A * H / 100
R	80,539,129	24.9120	2.0548	0.0000	0.6238	27.5906	11.0960	16.4946	\$13,301,101
G	7,523,438	27.2706	2.2110	0.0000	0.6238	30.1054	11.1920	18.9134	\$1,422,938
J	21,901,594	19.8888	1.7318	0.0000	0.6238	22.2444	11.1810	11.0634	\$2,423,061
P	381,947	16.4683	1.3297	0.0000	0.6238	18.4218	11.0010	7.4208	\$28,343
Total	110,446,108								\$17,175,443

Rate	Total Lost Contribution to Fixed Cost, \$/Yr	Forecast 2019 Sales ⁶ , kWh/yr	Estimated Impact on Rates, ¢/kWh
	K = I	L	M = (K / L) * 100
R	\$13,301,101		
G	\$1,422,938		
J	\$2,423,061		
P	\$28,343		
Total	\$17,175,443		
Total Company		1,059,297,378	1.62

Notes:

- See Appendix A, page 5, column H.
- Source: Base Energy Rates from Docket 2015-0170 (HELCO 2016 Test Year) Sched R Docket 2015-0170 (HELCO 2016 Test Year) FINAL, Exhibit 2 Attachment 1, page 21, filed 7/30/18
Sched G: Docket 2015-0170 (HELCO 2016 Test Year) FINAL, Exhibit 2 Attachment 1, page 38, filed 7/30/18
Sched J: Docket 2015-0170 (HELCO 2016 Test Year) FINAL, Exhibit 2, Attachment 1, page 57, filed 7/30/18
Sched P: Docket 2015-0170 (HELCO 2016 Test Year) FINAL, Exhibit 2, Attachment 1, page 71, filed 7/30/18
- PPAC Rates from effective rate summaries for January 2019.
- REIP and DSM rate from effective rate summaries for January 2019, RAM based on Decoupling Transmittal No. 18-01 filed on May 21, 2018, Decoupling Calculation workbook, Schedule A, page 1
- Source: Docket No. 2015-0170, TY 2016 Final D&O, Exhibit 3, page 79.
- Sales from 2019 Revenue Budget forecast

Hawai'i Electric Light

Estimated kW and kWh by technology and rate schedule

Rate	NEM kW installed by Technology				NEM kWh Installed by Technology			
	PV kW NEM installed (Cumulative Dec 31, 2018) NEM ^A	Wind kW NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kW NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kW	PV kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^{A,B}	Wind kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kWh
	A	B	C	D= sum(A:C)	E	F	G	H= sum(E:G)
R	54,064	50	0	54,114	80,512,109	127,020	0	80,639,129
G	5,052	0	0	5,052	7,523,438	0	0	7,523,438
J	14,347	170	0	14,517	21,365,552	536,042	0	21,901,594
P	112	0	49	161	167,327	0	214,620	381,947
Total	73,575	220	49	73,844	109,568,426	663,062	214,620	110,446,108

Source: Grid Technologies Department.

^A NEM PV/wind/hydro kW data from respective 2018 utility detailed year end spreadsheets.

^B PV capacity factor of 17% (Based on PV benchmarking developed by E3 for FIT pricing (Docket No 2008-0273, page 20), Multiply by hours in year- 8760)

^E Wind capacity factor range of 29% to 39%.

^F Hydro capacity factor of 50%.

Maui Electric Company - Maui Division

Estimated Lost Contribution to Fixed Costs and Surcharges based on NEM installations as-of December 31, 2018

Rate	Total Lost kWh/yr ¹ A	Base Energy Rate ² , cents/kWh B	Eff. Interim ² Increase % C	Eff. Base Energy Rate, cents/kWh D= B*(C)	Eff. PPAC ³ cents/kWh E	REIP & DSM ⁴ cents/kWh F	RAM ⁴ cents/kWh G	Total Eff. Base Energy Rate, cents/kWh H= sum(D:G)	Production Energy Rate ⁵ cents/kWh I	Lost Contribution to Fixed Cost, cents/kWh J= H- I	Total Lost Contribution to Fixed Cost, \$/Yr K = A * J / 100
R	88,097,883	33.5605	7.42%	36.0507	0.0094	0.0000	-	36.0601	24.6820	11.3781	\$10,023,856
G	12,083,883	34.5890	7.08%	37.0379	0.0015	0.4991	-	37.5385	24.8630	12.6755	\$1,531,690
J	23,725,882	30.4163	7.50%	32.6975	-0.0016	0.4991	-	33.1950	25.0050	8.1900	\$1,943,155
P	1,757,606	27.7504	7.70%	29.8872	0.0013	0.4991	-	30.3876	24.8200	5.5676	\$97,856
Total	125,665,234										\$13,596,557

Rate	Total Lost Contribution to Fixed Cost, \$/Yr K = J	Forecast 2019 Sales ⁶ kWh/Yr L	Estimated impact on Rates, \$/kWh M = (K / L) * 100
R	\$10,023,856		
G	\$1,531,690		
J	\$1,943,155		
P	\$97,856		
Total	\$13,596,557		
Total Company		991,375,911	1.37

Notes:

- See Appendix A, page 7, column H.
- Source: Base Energy Rates, from Docket 2011-0092 (MECO 2012 Test Year)- Maui Division; Interim Increase from Docket 2017-0150 (MECO 2018 Test Year) filed 8/21/18, effective August 23, 2018.
Sched R: Docket 2011-0092 (MECO 2012 Test Year), Maui Division, Exhibit 4, Attachment 1, page 8, filed 06/17/2013.
Sched G: Docket 2011-0092 (MECO 2012 Test Year), Maui Division, Exhibit 4, Attachment 1, page 9, filed 06/17/2013.
Sched J: Docket 2011-0092 (MECO 2012 Test Year), Maui Division, Exhibit 4, Attachment 1, page 33, filed 06/17/2013.
Sched P: Docket 2011-0092 (MECO 2012 Test Year), Maui Division, Exhibit 4, Attachment 1, page 40, filed 06/17/2013.
- PPAC Rates Effective January 2019
- REIP and DSM rate from effective rate summaries for January 2019. RAM based on Transmittal 18-01 filed on July 6, 2018, Probable Entitlement, Decoupling Calculation Schedule A workbook, page 1
- Docket 2011-0092 (MECO 2012 Test Year), Maui Division, Exhibit 5, page 66, filed 06/17/2013.
- Sales from 2019 Revenue Budget forecast

Maui Electric Company - Maui Division

Estimated kW and kWh by technology and rate schedule

Rate	NEM kW Installed by Technology				NEM kWh Installed by Technology			
	PV kW NEM installed (Cumulative Dec 31, 2018) NEM ^A	Wind kW NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kW NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kW	PV kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^{A,B}	Wind kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kWh
	A	B	C	D= sum(A:C)	E	F	G	H= sum(E:G)
R	59,122	21	0	59,143	88,044,408	53,475	0	88,097,883
G	8,106	5	0	8,111	12,071,872	11,991	0	12,083,863
J	15,853	47	0	15,900	23,607,245	118,637	0	23,725,882
P	1,170	6	0	1,176	1,742,364	15,242	0	1,757,606
Total	84,251	78	0	84,329	125,465,889	199,345	0	125,665,234

Source: Grid Technologies Department.

^A NEM PV/wind/hydro kW data from respective 2018 utility detailed year end spreadsheets.

^B PV capacity factor of 17% (Based on PV benchmarking developed by E3 for FIT pricing (Docket No 2008-0273, page 20), Multiply by hours in year-8760.

^E Wind capacity factor range of 29%.

Maui Electric Company - Lanai Division

Estimated Lost Contribution to Fixed Costs and Surcharges based on NEM Installations as-of December 31, 2018

Rate	Total Lost kWh/yr ¹	Base Energy Rate ² , cents/kWh	Eff. Interim ² Increase %	Eff. Base Energy Rate, cents/kWh	RAM ⁴ cents/kWh	Eff. Base Energy Rate cents/kWh	Production Energy Rate ⁵ cents/kWh	Lost Contribution to Fixed Cost, cents/kWh	Total Lost Contribution to Fixed Cost, \$/Yr
	A	B	C	D= B+(B*C)	E	F= sum(B:E)	G	H= F- G	J = A * H / 100
R	672,082	42.7689	6.36%	45.4890	0.0000	45.4890	35.2000	10.2890	\$69,151
G	98,972	44.8726	6.05%	47.5874	0.0000	47.5874	35.4360	12.1514	\$12,027
J	355,978	42.5860	6.21%	45.2306	0.0000	45.2306	35.5590	9.6716	\$34,429
P	-	40.2141	6.49%	42.8240	0.0000	42.8240	34.9320	7.8920	\$0
Total	1,127,033								\$115,607

Rate	Total Lost Contribution to Fixed Cost, \$/Yr	Forecast 2019 Sales ⁶ kWh/Yr	Estimated Impact on Rates, ¢/kWh
	K = J	L	M = (K / L) * 100
R	\$69,151		
G	\$12,027		
J	\$34,429		
P	\$0		
Total	\$115,607		
Total Company		33,384,349	0.35

Notes:

- 1 See Appendix A, page 9, column H.
- 2 Source: Base Energy Rates, from Docket 2011-0092 (MECO 2012 Test Year)- Lanai Division; Interim Increase from Docket 2017-0150 (MECO 2018 Test Year) filed 8/21/18, effective August 23, 2018.
 Sched R: Docket 2011-0092 (MECO 2012 Test Year), Lanai Division, Exhibit 4, Attachment 1, page 83, filed 06/17/2013.
 Sched G: Docket 2011-0092 (MECO 2012 Test Year), Lanai Division, Exhibit 4, Attachment 1, page 84, filed 06/17/2013.
 Sched J: Docket 2011-0092 (MECO 2012 Test Year), Lanai Division, Exhibit 4, Attachment 1, page 92, filed 06/17/2013.
 Sched P: Docket 2011-0092 (MECO 2012 Test Year), Lanai Division, Exhibit 4, Attachment 1, page 101, filed 06/17/2013.
- 3 No PPAC rates for Lanai
- 4 REIP and DSM rate from effective rate summaries for January 2019, RAM based on Transmittal 18-01 filed on July 6, 2018, Probable Entitlement, Decoupling Calculation Schedule A workbook, page 1.
- 5 Docket 2011-0092 (MECO 2012 Test Year), Lanai Division, Exhibit 5, page 143, filed 06/17/2013.
- 6 Sales from 2019 Revenue Budget forecast

Maui Electric Company - Lanai Division

Estimated kW and kWh by technology and rate schedule

Rate	NEM kW Installed by Technology				NEM kWh Installed by Technology			
	PV kW NEM installed (Cumulative Dec 31, 2018) NEM ^A	Wind kW NEM installed (Cumulative Dec 31, 2018) NEM ^F	Hydro kW NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kW	PV kWh generated in one year from NEM installed (Cumulative Dec 31, 20178 NEM ^{A,B}	Wind kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kWh
	A	B	C	D= sum(A:C)	E	F	G	H= sum(E:G)
R	451	0	0	451	672,082	0	0	672,082
G	66	0	0	66	98,972	0	0	98,972
J	239	0	0	239	355,978	0	0	355,978
P	0	0	0	0	0	0	0	0
Total	757	0	0	757	1,127,033	0	0	1,127,033

Source: Grid Technologies Department.

^A NEM PV/wind/hydro kW data from respective 2018 utility detailed year end spreadsheets.

^B PV capacity factor of 17% (Based on PV benchmarking developed by E3 for FIT pricing (Docket No 2008-0273, page 20), Multiply by hours in year-8760.

Maui Electric Company - Molokai Division

Estimated Lost Contribution to Fixed Costs and Surcharges based on NEM installations as-of December 31, 2018

Rate	Total Lost kWh/yr ¹	Base Energy Rate ² , cents/kWh	Eff. Interim ² Increase %	Eff. Base Energy Rate, cents/kWh	RAM ⁴ cents/kWh	Eff. Base Energy Rate cents/kWh	Production Energy Rate ⁵ cents/kWh	Lost Contribution to Fixed Cost, cents/kWh	Total Lost Contribution to Fixed Cost, \$/Yr
	A	B	C	D= B*(B*C)	E	F= sum(B:E)	G	H= F- G	J= A * H / 100
R	2,163,808	39.0927	6.68%	41.7041	0.0000	41.7041	28.8010	12.9031	\$279,198
G	527,177	44.8344	6.22%	47.6231	0.0000	47.6231	29.3620	18.2611	\$96,268
J	466,120	36.9705	6.75%	39.4660	0.0000	39.4660	29.2020	10.2640	\$47,843
P	148,920	29.5392	7.29%	31.6926	0.0000	31.6926	28.5660	3.1266	\$4,656
Total	3,306,024								\$427,965

Rate	Total Lost Contribution to Fixed Cost, \$/Yr	Forecast 2019 Sales ⁶ kWh/Yr	Estimated Impact on Rates, ¢/kWh
	K = J	L	M = (K / L) * 100
R	\$279,198		
G	\$96,268		
J	\$47,843		
P	\$4,656		
Total	\$427,965		
Total Company		28,277,042	1.51

Notes:

- 1 See Appendix A, page 11, column H.
- 2 Source: Base Energy Rates, from Docket 2011-0092 (MECO 2012 Test Year)- Molokai Division; Interim Increase from Docket 2017-0150 (MECO 2018 Test Year) filed 8/21/18, effective August 23, 2018.
Sched R: Docket 2011-0092 (MECO 2012 Test Year), Molokai Division, Exhibit 4, Attachment 1, page 132, filed 08/17/2013.
Sched G: Docket 2011-0092 (MECO 2012 Test Year), Molokai Division, Exhibit 4, Attachment 1, page 133, filed 06/17/2013.
Sched J: Docket 2011-0092 (MECO 2012 Test Year), Molokai Division, Exhibit 4, Attachment 1, page 140, filed 06/17/2013.
Sched P: Docket 2011-0092 (MECO 2012 Test Year), Molokai Division, Exhibit 4, Attachment 1, page 148, filed 06/17/2013.
- 3 No PPAC rates for Molokai
- 4 REIP and DSM rate from effective rate summaries for January 2019, RAM based on Transmittal 18-01 filed on July 6, 2018, Probable Entitlement, Decoupling Calculation Schedule A workbook, page 1.
- 5 Docket 2011-0092 (MECO 2012 Test Year). Molokai Division, Exhibit 5, page 220, filed 6/17/2013.
- 6 Sales from 2019 Revenue Budget forecast

Maui Electric Company - Molokai Division
 Estimated kW and kWh by technology and rate schedule

Rate	NEM kW Installed by Technology				NEM kWh Installed by Technology			
	PV kW NEM installed (Cumulative Dec 31, 2018) NEM ^A	Wind kW NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kW NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kW	PV kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^{A,B}	Wind kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^E	Hydro kWh generated in one year from NEM installed (Cumulative Dec 31, 2018) NEM ^F	Total kWh
	A	B	C	D= sum(A:C)	E	F	G	H= sum(E:G)
R	1,453	0	0	1,453	2,163,808	0	0	2,163,808
G	354	0	0	354	527,177	0	0	527,177
J	313	0	0	313	466,120	0	0	466,120
P	100	0	0	100	148,920	0	0	148,920
Total	2,220	0	0	2,220	3,306,024	0	0	3,306,024

Source: Grid Technologies Department.

^A NEM PV/wind/hydro kW data from respective 2018 utility detailed year end spreadsheets.

^B PV capacity factor of 17% (Based on PV benchmarking developed by E3 for FIT pricing (Docket No 2008-0273, page 20), Multiply by hours in year-8760.