

Hawaiian Electric Companies Electric Vehicle Pilot Rates Report

Annual Report on the Progress and Status of the Commercial Public Electric Vehicle Charging Service Pilot Rates Transmittal No. 13-07 March 31, 2015

I. Background

In accordance with Ordering Paragraph 1.C. of the Hawai‘i Public Utilities Commission’s Decision and Order No. 31338 (“D&O 31338”) filed July 1, 2013 regarding Transmittal Nos. 13-07 and 13-08 (consolidated), this report provides information on the status of Hawaiian Electric Companies’¹ implementation of Commercial Public Electric Vehicle Charging Facility Service Pilot, Schedule EV-F, and Commercial Public Electric Vehicle Service Pilot Schedule EV-U for the year ending December 31, 2014.

Introduction

Electric Vehicles (“EV”) are a critical component of the Hawaiian Electric Companies’ overall vision to increase customer options and actively support Hawai‘i’s clean transportation goals. The Hawaiian Electric Companies’ objective is to proactively participate in the adoption of EVs and reduce dependence on fossil fuel by increasing EV infrastructure, designing rates that benefit EV-owners and site hosts alike, and collaborating with external stakeholders to best support the EV ecosystem.

To further support the State of Hawaii’s clean transportation goals and broader EV ecosystem, the Companies are continuing to improve their comprehensive strategy with input from external stakeholders.

This report focuses on expanding public charging and the approach to installing Direct Current (“DC”) fast chargers and the accompanying EV-U rate.

¹ The Hawaiian Electric Companies (collectively “Companies” and individually a “Company”) are: Hawaiian Electric Company, Inc. (“Hawaiian Electric”), serving the island of O‘ahu, Hawai‘i Electric Light Company, Inc. (“Hawai‘i Electric Light”), serving Hawai‘i island, and Maui Electric Company, Limited (“Maui Electric”), serving the islands of Maui, Lana‘i, and Moloka‘i.

II. Schedule EV-F Tariff

On July 4, 2013, pursuant to D&O 31338, ordering paragraph 3, the Hawaiian Electric Companies filed tariff Schedule EV-F with an effective date of July 4, 2013, which included, among other terms and conditions, the following:

1. The rate is applicable only to separately metered commercial public EV charging facilities providing charging services with demand no greater than 100 kilowatt (“kW”). The facility is limited to no more than 5 kW for ancillary load, such as area lighting.
2. Time-of-use (“TOU”) rate periods include Priority-Peak, Mid-Peak, and Off-Peak periods.

Priority-Peak	5:00 p.m. – 9:00 p.m., Monday-Friday
Mid-Peak	7:00 a.m. – 5:00 p.m., Monday-Friday
	7:00 a.m. – 9:00 p.m., Saturday-Sunday
Off-Peak	9:00 p.m. – 7:00 a.m., daily
3. The maximum number of accounts is limited to: (A) 100 meters within Hawaiian Electric’s service territory; (B) 40 meters within Hawai‘i Electric Light’s service territory; and (C) 40 meters within Maui Electric’s service territory, consisting of its Maui, Lana‘i, and Moloka‘i Divisions.
4. The five year pilot is effective through June 30, 2018.

Schedule EV-F supports the State’s clean energy goals by encouraging “the development of public EV charging facilities by pricing electricity at levels that are lower than Schedule EV-C and Schedule J at lower energy consumption levels for start-up EV public charging operators.”²

² Transmittal No. 13-07 at 22.

A. Review of the Adoption and Status of Schedule EV-F

Tables 1a and 1b below provide a breakdown by island of the number of customer accounts and kilowatt-hour (“kWh”) consumption billed each month, respectively, on the Schedule EV-F pilot rate. The three O‘ahu customers and two of the Maui customers had existing separately metered DC fast chargers, previously on Schedule J. Maui Electric, in connection with its public DC fast charging service provided under Schedule EV-U, is also considered a customer and is included in the table below.³ The charging stations are located at gas stations, a shopping center, a tourist destination, and Maui Electric’s headquarters. Data included for “Maui” represents Maui Electric’s service territory including Maui, Moloka’i, and Lana’i.

Table 1a
Schedule EV-F Customers Billed
January – December 2014

Month	O‘ahu	Hawai‘i	Maui	TOTAL
Jan	3	0	2	5
Feb	3	0	2	5
Mar	3	0	3	6
Apr	3	0	3	6
May	3	0	3	6
Jun	3	0	3	6
Jul	3	0	3	6
Aug	3	0	2 ¹	5
Sep	3	0	3	6
Oct	3	0	3	6
Nov	3	0	3	6
Dec	3	0	3	6

¹ One customer requested a temporary suspension of service.

³ As discussed in Section III.C., below, Schedule EV-U specifies that a Company-operated facility “is subject to the appropriate rate schedule for electric service.”

A total of 137,980 kWh were consumed in the year 2014, supporting electric vehicle charging under Schedule EV-F. Starting in September 2014, some customer-owned chargers were taken out of service and is reflected by a drop in kWh billed on O‘ahu.

Table 1b
Schedule EV-F kWh Billed
January – December 2014

Month	O‘ahu	Hawai‘i	Maui	Total
January	2,737	0	6,369	9,106
February	2,363	0	7,479	9,842
March	3,421	0	7,715	11,136
April	3,307	0	8,116	11,423
May	3,236	0	8,580	11,816
June	3,055	0	10,215	13,270
July	3,225	0	7,364	10,589
August	3,109	0	4,582	7,691
September	3,518	0	9,769	13,287
October	3,167	0	11,457	14,624
November	1,138	0	11,350	12,488
December	357	0	12,351	12,708
TOTAL	32,633	0	105,347	137,980

Table 1c below provides a breakdown of consumption in each TOU period for each Company. The majority of energy consumption occurred during the mid-peak period and only 14% occurred during the off-peak. Five of the six charging stations under this rate do not charge the EV drivers fees based on time-of-use. Therefore, usage of the facility is not influenced by the TOU rate.

Table 1c
Schedule EV-F kWh Consumption by TOU Period
January – December 2014

Territory	Priority	Mid	Off	TOTAL
O'ahu	6,083	20,667	5,883	32,633
Hawai'i	0	0	0	0
Maui	19,444	71,886	14,017	105,347
TOTAL	25,527	92,553	19,900	137,980

B. Summary of Cost and Revenue

Table 2 presents a breakdown of the revenue generated each month from Schedule EV-F for the three Companies. Between January 1 and December 31, 2014, \$58,546.51 in revenue was generated from customers under the Schedule EV-F Pilot rate.

Table 2
Schedule EV-F Revenues
January – December 2014

Month	O'ahu	Hawai'i	Maui	TOTAL
Jan	\$ 1,103.71	\$ -	\$ 2,717.89	\$ 3,821.60
Feb	\$ 972.03	\$ -	\$ 3,201.44	\$ 4,173.47
Mar	\$ 1,406.61	\$ -	\$ 3,303.50	\$ 4,710.11
Apr	\$ 1,342.67	\$ -	\$ 3,462.40	\$ 4,805.07
May	\$ 1,311.21	\$ -	\$ 3,685.95	\$ 4,997.16
Jun	\$ 1,241.09	\$ -	\$ 4,417.97	\$ 5,659.06
Jul	\$ 1,336.58	\$ -	\$ 3,196.75	\$ 4,533.33
Aug	\$ 1,291.87	\$ -	\$ 1,996.37	\$ 3,288.24
Sep	\$ 1,462.19	\$ -	\$ 4,175.02	\$ 5,637.21
Oct	\$ 1,311.66	\$ -	\$ 4,884.63	\$ 6,196.29
Nov	\$ 468.86	\$ -	\$ 4,843.12	\$ 5,311.98
Dec	\$ 173.01	\$ -	\$ 5,239.98	\$ 5,412.99
TOTAL	\$ 13,421.49	\$ -	\$ 45,125.02	\$ 58,546.51

Incremental costs to support Schedule EV-F, including cost to enroll and bill six customers, are de minimis. The incremental cost for additional metering support is recovered through the rate's time-of-use metering charge.

C. Economic Development Support of Schedule EV-F

Rate Schedule EV-F is an economic development rate supporting public EV charging facilities by eliminating the customer demand charge. The energy charge is set such that facilities with low usage under Schedule EV-F would not experience significant monthly electricity costs, but would experience costs higher than other commercial rates when monthly consumption exceeds approximately 5,000 kWh on a regular basis. Had Schedule EV-F not been available, these participating facilities would likely have fallen under Schedule J, General Service Demand. As such, the difference in revenues between the two schedules is indicative of the economic benefit (i.e., subsidization) provided to EV-F customers by the other body of non-participating customers. Notably, however, the duration of the tariff pilot and the allowed number of participants is limited. Of further note, customer benefits that accrue from a robust EV charging infrastructure include progress toward an energy independent future, long term energy price stability, and reduced environmental impacts.⁴ In addition, Schedule EV-F revenues are included in the Decoupling Mechanism Revenue Balancing Account, to the benefit of all customers.

Table 3 below summarizes the total monthly revenue generated from Schedule EV-F compared to the potential revenue generated if the charging facility were billed under Schedule J. The potential Schedule J revenue provided in Table 3 is calculated based on an assumed monthly billing demand of 47.5 kW and energy consumption equivalent to that under Schedule EV-F. The total difference in revenues between Schedule J and Schedule EV-F for the year 2014 was \$26,445.76.

⁴ See Transmittal 13-07 at 8.

Table 3
Difference in Revenues
EV-F vs. Schedule J
January – December 2014¹

Month	Hawaiian Electric			Maui Electric		
	Total Schedule EV-F	Estimated Schedule J	Difference	Total Schedule EV-F	Estimated Schedule J	Difference
Jan	\$ 1,103.71	\$ 2,648.25	\$ 1,544.54	\$ 2,717.89	\$ 3,231.72	\$ 513.83
Feb	\$ 972.03	\$ 2,568.70	\$ 1,596.67	\$ 3,201.44	\$ 3,621.15	\$ 419.71
Mar	\$ 1,406.61	\$ 2,862.51	\$ 1,455.90	\$ 3,303.50	\$ 4,086.36	\$ 782.86
Apr	\$ 1,342.67	\$ 2,813.11	\$ 1,470.44	\$ 3,462.40	\$ 4,370.58	\$ 908.18
May	\$ 1,311.21	\$ 2,794.58	\$ 1,483.37	\$ 3,685.95	\$ 4,548.16	\$ 862.21
Jun	\$ 1,241.09	\$ 2,752.57	\$ 1,511.48	\$ 4,417.97	\$ 5,138.92	\$ 720.95
Jul	\$ 1,336.58	\$ 2,818.85	\$ 1,482.27	\$ 3,196.75	\$ 3,990.72	\$ 793.97
Aug	\$ 1,291.87	\$ 2,787.76	\$ 1,495.89	\$ 1,996.37	\$ 2,667.34	\$ 670.97
Sep	\$ 1,462.19	\$ 2,906.00	\$ 1,443.81	\$ 4,175.02	\$ 4,783.86	\$ 608.84
Oct	\$ 1,311.66	\$ 2,797.23	\$ 1,485.57	\$ 4,884.63	\$ 5,483.92	\$ 599.29
Nov	\$ 468.86	\$ 2,219.55	\$ 1,750.69	\$ 4,843.12	\$ 5,460.11	\$ 616.99
Dec	\$ 173.01	\$ 2,031.90	\$ 1,858.89	\$ 5,239.98	\$ 5,608.42	\$ 368.44
TOTAL	\$ 13,421.49	\$ 32,001.01	\$ 18,579.52	\$ 45,125.02	\$ 52,991.26	\$ 7,866.24

¹ There were no Schedule EV-F customers for Hawai'i Electric Light in 2014, and according do not appear in this table.

D. Customer Outreach

In addition to advertising in the 2014 summer edition of HawaiiDealer, the official publication of the Hawaii Automobile Dealers Association, the Companies have reached out to EV dealerships that may be interested in the installation of DC fast charging facilities. The Companies have also developed relationships with local auto dealerships in the anticipation of installing more DC fast charging facilities.

There are few facilities with enough centrally located Level 2⁵ charging systems such that they may realize the benefit of the elimination of the customer demand charge. None are known to be separately metered. Notably, many charging facilities operated by the host site or a third party choose to interconnect to the utility under an existing service. The Companies have also reached out to other known companies installing DC fast charging infrastructure throughout the Companies' service territories and have further provided information about all EV rates on the Companies' websites. The Companies were able to obtain participation on Schedule EV-F after conducting outreach to operators with separately metered DC fast charging facilities.

⁵ SAE Level 2 is specified at 240 volts up to 19.2 kW. Typical EV battery charging rates are between 3.3 – 6.6 kW, providing between 12 to 25 miles per hour charged.

E. Recommendation of revisions to rate structures

The Companies support the continuation of the current rate structure of Schedule EV-F without revisions at this time. The rate achieves several objectives including addressing range anxiety, supporting research, development and demonstration (“RD&D”) efforts, and providing incentives for economic development, as further explained below.

1. Addressing Range Anxiety

Customers currently participating in Schedule EV-F utilize DC fast charger(s) at their facilities. The use of these EV chargers suggests that EV drivers are taking advantage of the availability of the chargers to address range anxiety. The Hawaiian Electric Companies do not recommend any revisions to Schedule EV-F at this time.

2. RD&D activities related to EV charging Technologies and Load Control

The Companies understand potential concerns for third parties and their customers to participate in load control demonstrations. Therefore, the Companies seek to research EV charger load control under controlled situations at Company operated facilities under Schedule EV-U. Therefore, the Companies do not recommend any revisions to Schedule EV-F at this time.

3. Adjust the economic development incentive of Schedule EV-F

The Hawaiian Electric Companies do not recommend any revisions to Schedule EV-F at this time.

III. Schedule EV-U Tariff

On July 3, 2013, pursuant to D&O 31338, ordering paragraph 3, the Hawaiian Electric Companies filed tariff Schedule EV-U with an effective date of July 4, 2013, which included, among other terms and conditions, the following:

1. Company-operated public charging facilities are based upon a fee-per-charge session.
2. Per session fees during the Priority-Peak and Off-Peak periods are set no more than \$0.50 above and \$0.50 below the Mid-Peak fee, respectively.
3. The maximum, aggregate number of Company facilities will be twenty-five (25).
4. The Company may curtail charging of electric vehicles at EV-U charging facilities under certain circumstances.
5. The five year pilot is effective through June 30, 2018.

Schedule EV-U is intended to support the EV market by allowing the Companies to install and operate public EV charging facilities in strategic locations to address range anxiety, support the rental EV market, and increase EV acceptance by residents in multi-family dwellings (“MFDs”).

A. Review of the Adoption and Status of Schedule EV-U

1. Review of Schedule EV-U Charging Facilities

The breakdown of charging stations under Schedule EV-U on each island is detailed in Table 4 below. Between January 1 and December 31, 2014, one DC fast charger was available for public use under Schedule EV-U. Data included for “Maui” represents Maui Electric’s service territory including Maui, Moloka‘i, and Lana‘i.

Table 4
DC Fast Charger Under Schedule EV-U
January – December 2014

Month	O‘ahu	Hawai‘i	Maui
Jan	0	0	0
Feb	0	0	0
Mar	0	0	0
Apr	0	0	0
May	0	0	0
Jun	0	0	1
Jul	0	0	1
Aug	0	0	1
Sep	0	0	1
Oct	0	0	1
Nov	0	0	1
Dec	0	0	1

Hawaiian Electric

Through the end of 2014, Hawaiian Electric reached out to 42 prospective site hosts. Selection criteria of potential host sites include, but are not limited to the following: ability to support range extension to remote destinations, ability to support MFDs, proximity to existing charging facilities, customer’s willingness to participate, site accessibility, and cost of installation and operations.⁶ Based upon geographical regions, the Companies sought to obtain Memorandum of Understandings (“MOUs”) with prospective site hosts within each region. Currently, MOUs have been obtained for three sites – one located in a shopping center in Windward O‘ahu, another in a shopping center in Leeward O‘ahu, and the third, in a tourist destination in Central O‘ahu.

In 2013, Hawaiian Electric initiated the first Request For Proposal (“RFP”) for a DC fast charging system with integrated buffer battery. The RFP ended without a contract within the required timeframe. To include potential new vendors, a second RFP was issued in July 2014 and two proposals were received by the deadline in August 2014, with a contract awarded in

⁶ See Section II.E., herein, for discussion of methodology for rating potential EV-U charging sites.

September 2014. The DC fast charger with integrated buffer battery will demonstrate the ability to provide 50 kW CHAdeMO⁷ DC fast charging output while limiting grid demand to 25 kW.

In December 2013, an RFP was initiated for three DC fast chargers supporting both CHAdeMO and SAE J1772 Combined Charging System (“CCS”)⁸ DC fast charging standards. The CHAdeMO and SAE J1772 CCS standards are incompatible with each other, requiring a charging system with independent cords for each standard. Five proposals were received for a charging system by the due date in January 2014, and the selected vendor was awarded a contract in March 2014.

Work to provide electric service to the first host site began in December 2014 and the site is planned to be operational in mid-2015.

Hawai‘i Electric Light

For 2014, Hawai‘i Electric Light began evaluation of seven locations to locate two potential charging facilities on Hawai‘i Island. Construction started at the Company’s first site at its Kona baseyard in Kailua-Kona. Hawai‘i Electric Light will issue an RFP for the DC fast charger in 2015. Also in 2015, a second DC fast charger is planned for the Company’s main office in Hilo, Hawai‘i.

Maui Electric

In September 2013, Maui Electric issued an RFP for a DC fast charger to be installed at the Company’s main office in Kahului, Maui. The RFP was sent out to 15 prospective vendors with 5 returning bids. The contract was awarded that same month. In June 2014, Maui Electric began providing DC fast charging service to the public at its main office in Kahului. The installation consisted of an ABB Ltd CHAdeMO 50 kW DC fast charger and Greenlots charging system. A press release was issued to announce the availability of the first Company DC fast charging facility to the public in June 2014 (refer to Attachment A).

The Greenlots’ SKY Network accepts payment for charging by credit card (via point-of-sale or smartphone app) and by radio frequency identification (“RFID”) card. This charger is uniquely positioned to serve the rental EV market since it accepts credit card payments and the user does not have to pre-register with any third-party service to use the charger. Greenlots provides service for payment collection as well as access to system data and status through its back-office network. Revenues and transaction fees are sent to Maui Electric on a monthly basis. The net revenues are shown in Table 7 below.

⁷ CHAdeMO compatible EV manufacturers include, but are not limited to Honda, Kia, Mitsubishi, and Nissan: <https://www.chademo.com/products/evs/>

⁸ SAE International’s J1772 CCS is currently supported by, but not limited to BMW, Ford, General Motors, and Volkswagen: <http://articles.sae.org/11005/>

In 2014, Maui Electric began planning an EV ride-and-drive event to promote the charging station and provide EV education to the community. The event was held on January 17, 2015 and started with a blessing of the charging station and continued by providing customers an opportunity to ride or drive the BMW i3 or Nissan Leaf. Maui Electric partnered with JUMPSmart, car dealerships, a rental car agency, and financial institutions to answer questions about EVs such as time-of-use rates, charging sites, vehicle purchasing/leasing, rental cars, and financing options.

In 2014, Maui Electric also initiated evaluation of four potential hosts for the next site location on the island of Maui. The next installation is expected in early 2016.

2. Schedule EV-U Charge Session Details

The details of charge sessions are provided in Tables 5a and 5b. Table 5a below provides details of monthly charging sessions for each Company. DC fast charging can charge a fully discharged Nissan Leaf to 80% capacity, or about 19 kWh, in 30 minutes.

Table 5a
Schedule EV-U Charging Session Detail
January – December 2014

Month	O'ahu		Hawai'i		Maui	
	Sessions	kWh	Sessions	kWh	Sessions	kWh
Jan	-	-	-	-	-	-
Feb	-	-	-	-	-	-
Mar	-	-	-	-	-	-
Apr	-	-	-	-	-	-
May	-	-	-	-	-	-
Jun	-	-	-	-	0	0
Jul	-	-	-	-	0	0
Aug	-	-	-	-	0	0
Sep	-	-	-	-	2	5.5
Oct	-	-	-	-	0	0
Nov	-	-	-	-	0	0
Dec	-	-	-	-	0	0
TOTAL	0	0	0	0	2	5.5

Table 5b below provides the breakdown of charging sessions by TOU period for each Company. Schedule EV-U defines a TOU per charge session fee based upon the start time of the session.

Table 5b
Schedule EV-U kWh Consumption by TOU Period
January – December 2014

Territory	Priority	Mid	Off
O'ahu	-	-	-
Hawai'i	-	-	-
Maui	0	2	0
TOTAL	0	2	0

The low usage of the Maui DC fast charger is presumably affected by other DC fast chargers also located in Kahului. In 2014, the JUMPSmart Maui⁹ program had five public sites providing DC fast charging at no cost. Each JUMPSmart facility has four DC fast charging ports. In 2015, JUMPSmart Maui will begin charging drivers a nominal monthly fee for the use of these DC fast chargers, which may result in more usage of the Maui Electric DC fast charger.

The Hawaii State Energy Office website¹⁰ provides data for eight other public charging stations in Kahului, Maui. These eight public charging stations are comprised of the following: one location with free DC fast chargers, four locations providing Level 2 charging, two locations with free Level 1¹¹ charging, and one location with both Level 2 and Level 1 charging. Three of the Level 2 charging locations provide services for free. One Level 2 charging location provides service for \$2 per hour and the other provides service for \$1 to \$2 per hour, based upon network subscription. Services providing 6.6 kW Level 2 charging can provide 19 kWh (80% of Nissan Leaf battery capacity) in three hours, or \$6 at a fee of \$2 per hour. Under Schedule EV-U, a Company operated DC fast charger may provide the equivalent charge for \$7.00 at the mid-peak rate, but can do so within 30 minutes as opposed to three hours.

⁹ JumpSmart Maui is a \$30 million project funded by Japan's New Energy and Industrial Technology Development Organization (NEDO) to study integration of variable renewable resources and integration of EVs to the electric grid.

¹⁰ <http://energy.hawaii.gov/testbeds-initiatives/ev-ready-program/electric-vehicle-ev-charging-stations-in-hawaii>

¹¹ SAE Level 1 charging is specified at 120 volts up to 1.4 kW, typically providing about 4 miles for every hour charged. Service is provided by a 120 volt receptacle for use with the driver-owned charging cord set.

B. Summary of Costs and Revenue

Table 6 below summarizes expenses from January to December 31, 2014, for capital costs (for purchase of capital equipment and labor for design and installation at the project site), Operation & Maintenance (“O&M”) labor (for project management and research), and O&M non-labor (for operations and maintenance). Specifically, in preparation for the projects at sites under MOUs, Hawaiian Electric provided partial payment for three charging stations and has incurred fees for design consultation at one site. Hawai‘i Electric Light has incurred costs in conjunction with construction of its first Schedule EV-U facility. In 2014, Maui Electric finalized some payments for construction and branding of the first charging station.

Table 6
Labor and Non-labor Costs
January – December 2014

Service Territory	Cost Element	Cost
O‘ahu	Capital Costs	\$ 137,546.78
	O&M Labor Costs	\$ 24,539.88
	O&M Non-Labor Costs	\$ -
	Total Costs	\$ 162,086.66
Hawai‘i	Capital Costs	\$ 21,347.76
	O&M Labor Costs	\$ -
	O&M Non-Labor Costs	\$ -
	Total Costs	\$ 21,347.76
Maui	Capital Costs	\$ 28,948.24 ¹
	O&M Labor Expense	\$ 854.70
	O&M Non-Labor Expense	\$ - ²
	Total Costs	\$ 29,802.94
ALL	CAPITAL COSTS	\$ 161,897.81
	O&M LABOR COSTS	\$ 24,539.88
	O&M NON-LABOR COSTS	\$ 1,640.83
	TOTAL COSTS	\$ 188,078.52

¹ Includes \$25,944.96 for services performed in 2013, but paid in 2014.

² Does not include \$2,044.43 for energy cost applicable to other commercial customers.

C. Economic Development Support of Schedule EV-U

Rate Schedule EV-U, which prices the cost of electricity using Schedule EV-F, is characterized as an economic development rate similar to Schedule EV-F. Incremental revenues for 2014 are de minimis such that the Companies are unable to determine any level of subsidization by non-participating customers. Of note, as stated above, customer benefits that accrue from a robust EV charging infrastructure include progress toward an energy independent future, long term energy price stability, and reduced environmental impacts. Further, Schedule EV-U revenues will be included in determining the calculation of the Decoupling Mechanism Revenue Balancing Account, to the benefit of all customers.

Table 7 below provides details of net revenues between January 1 and December 31, 2014 collected under Schedule EV-U. Net revenues represent payment from the network service provider(s)¹² after deduction of any applicable transaction fees and taxes. Expenses accounted in net revenue are not reflected in the O&M cost above.

Table 7
Schedule EV-U Net Revenue
January – December 2014

Month	O'ahu	Hawai'i	Maui
Jan	\$ -	\$ -	\$ -
Feb	\$ -	\$ -	\$ -
Mar	\$ -	\$ -	\$ -
Apr	\$ -	\$ -	\$ -
May	\$ -	\$ -	\$ -
Jun	\$ -	\$ -	\$ 0
Jul	\$ -	\$ -	\$ 0
Aug	\$ -	\$ -	\$ 0
Sep	\$ -	\$ -	\$ 12.40
Oct	\$ -	\$ -	\$ 0
Nov	\$ -	\$ -	\$ 0
Dec	\$ -	\$ -	\$ 0
TOTAL	\$ 0	\$ 0	\$ 12.40

D. Recommendation of revisions to rate structures

The operation of public charging services on a customer's property requires service and access agreements before the start of construction, which may be a lengthy process. For this reason, at the end of 2014, one Company-owned charging station was available on Maui Electric property. The Companies are in the process of designing and installing charging facilities in all three service territories. Therefore, it is likely too early to assess impact on addressing range anxiety.

The Companies stated in Transmittal No. 12-05 that the “applicable rate tariffs would set the price of electricity, as a cost, for their own public DC fast charging facilities. Thus, Company-operated public EV charging facilities would be metered as electricity customers on an appropriate utility rate tariff...”¹³ As a result, Schedule EV-U specifies that a Company-operated facility “is subject to the appropriate rate schedule for electric service.”¹⁴ At some locations, providing a new service for the charging facilities may introduce added complexity and cost. Providing metered service within a large master metered property may be cost

¹² A network service provider is needed to remotely monitor equipment status, log usage, as well as support automated bill payment. As agreed upon by the parties in the proceeding to review Transmittal No. 13-07, network service provider(s) will be allowed access to charging equipment as provided under Schedule EV-U. Net revenues account for fees collected for charging under Schedule EV-U after any transaction fees. These fees are not included as O&M costs.

¹³ Transmittal No. 12-05, at 14.

¹⁴ Rate Schedule EV-U.

prohibitive, thereby precluding support of EV adoption in some locations or to certain customers. The Companies will investigate the possibility of sub-metering or utilizing usage data from the charger itself for purposes of reimbursing the master metered customer for usage related to the provision of charging services to obviate the need for a separate EV-U meter. This capability will be evaluated in conjunction with the Companies' purchase, deployment, and use of future DC fast chargers. Upon evaluation of such technology, the Companies may recommend revisions to the rate consistent with the foregoing.

The Companies do not recommend any revisions to Schedule EV-U at this time. Activities by the Companies to address range anxiety, conduct RD&D, and incentivize economic development are discussed below.

1. Addressing Range Anxiety

The Companies are installing or have plans to install DC fast charging equipment at locations which may address range anxiety or provide charging in areas near MFDs. The Companies do not recommend any revisions to Schedule EV-U at this time.

2. Company RD&D activities related to EV charging Technologies and Load Control

In partnership with the Electric Power Research Institute ("EPRI"), Hawaiian Electric is procuring a DC fast charging system with an integrated battery. This charging system will demonstrate the ability to provide 50 kW CHAdeMO charging output while not exceeding 25 kW demand from the grid, and providing load leveling capability to potentially manage the grid and the facility operator's demand.

In partnership with EPRI, Hawaiian Electric will also pursue research and demonstration to lower the maximum output of a 50 kW DC fast charging session to 25 kW through demand response. "Throttling" of an active DC fast charging session is not supported by the current CHAdeMO standard. Thus, Hawaiian Electric will pursue this research to evaluate DC fast charging's potential support for grid management.

With these plans, the Companies do not recommend any revisions to Schedule EV-U at this time.

3. Adjust the level of support for the EV Charging Market

The Hawaiian Electric Companies do not recommend any revisions to Schedule EV-U at this time.

E. Methodology for Identifying and Scoring Potential Sites

In the continued effort to identify optimal sites for new EV charging facilities, the Companies have developed a scoring rubric, on a 10 point scale, to assess future locations under

consideration. While this scoring rubric was not used for previous site evaluations, it will be implemented going forward to enable the Companies to:

- evaluate potential EV charging sites using consistent criteria, across all three companies;
- compare the pros and cons of various locations with more quantitative rigor; and
- prioritize capital allocation to sites with the highest score and potential for success.

By leveraging this methodology, the Companies aim to improve the selection process for locations that will best support the burgeoning EV market to the benefit of EV customers.

Outline of Methodology

In an effort to capture the elements of an effective EV charging facility and host site, the Companies have developed a scoring rubric comprised of eight dimensions as shown in the table below:

Dimensions	Description	Weight (%)
Reasonable one-time cost	Reasonable up-front costs for the project including installation, design & construction	20%
Landlord interest	Landowner willing to accept terms of charging station installation (and customer support if necessary)	15%
Minimal maintenance costs	Requires minimal ongoing maintenance and recurring costs	15%
Adequate dispersion of infrastructure	Adequate distance from other installed and/or proposed DC fast charger(s) to quell range anxiety	15%
Adequate availability of space	Site location provides adequate space to accommodate the charging equipment and vehicle	10%
High turnover	Located in area with high turnover to prevent the charger from being monopolized by single user	10%
Public accessibility	Site allows public access: minimal fees; favorable hours of operation	10%
High traffic	Located in an area with enough vehicle traffic through the site to maximize utilization and visibility	5%
TOTAL SCORE		100%

Each future EV site under consideration will be rated on a scale from 1-10 (1 being the lowest; 10 being the highest) on each of the above listed dimensions. A higher rating indicates that the site is more attractive on a particular dimension:

- For example, a site that scores a “9” on the “Landowner Interest” criterion indicates that the landowner is highly interested in hosting an EV charging facility on their property. This makes it much easier for the Companies to propose a site and begin construction in a timely manner.

- In contrast, a site that scores a “2” on the “high turnover” criterion would indicate that the site may not support high utilization of the charging facility. This type of site may not be the best use of available funds.

The Companies recognize that each dimension is not of equal importance. To add further nuance to the process, a percentage weighting system is used to account for the relative importance of each dimension. The weighting is subject to change in the future.

Please also note that in order to calculate a composite score for a prospective charging facility on a 10-point scale, all of the weights must add up to 100%.

Based on the 1-10 ratings on each dimension and the relative weights above, the total composite score for a prospective site is derived as follows:

$$\text{Total Composite Score} = \sum_{i=1}^n (w_i) \times (r_i), \text{ where:}$$

n = criteria number
 w = percentage weight
 r = rating (from 1 to 10)

Using this methodology, the Companies plan to calculate a score for each prospective site from 1 to 10 points. Based upon the future needs of the project, the Companies will then map all of the prospective sites and select the sites that have the highest composite. The tool may also be used to provide feedback to prospective sites which may be willing to further develop their site to be more attractive to the project.

Electric Vehicle Pilot Rates Report

Attachment A

Informational Material on Commercial Public Electric Vehicle Charging Service Pilot Rates



Schedule EV-F: What's in it for you?

What's in it for you? If you have a dealership, service station, parking lot or other business, you can install an electric vehicle fast charger as a customer benefit, to support clean energy or to attract EV drivers.

What's the offer? The new EV-F rate approved by the Hawaii Public Utilities Commission makes it easier financially for a business to install one or several public EV fast chargers under a separate meter. Electricity through the meter will have no "demand charge" typically paid by commercial customers.

What's a fast charger? A DC fast charger can fill an "empty" plug-in EV battery to an 80% charge in less than 30 minutes. For EV drivers, a fast charger is assurance they can quickly "top off" their battery while on the road, as other drivers use a gas station.

What's a "demand charge?" Many commercial customers' pay a demand charge as well as use charge. The demand charge is calculated on the customer's greatest electricity used during a fixed period. The demand charge offsets the utility's cost to maintain enough capacity to meet that top demand whenever the customer needs it.

What's in it for Hawaiian Electric? For our clean energy future, we want to help everyone use less imported oil. Fueling a vehicle with electricity, even from conventional generation, is cleaner and costs the customer less per mile than using gasoline. More EVs can reduce Hawaii's dependency on oil and encourage more local renewable energy, like wind and solar.

How can I learn more? Visit hawaiianelectric.com/GoEV or call 808-543-GOEV (4638).



Hawaiian
Electric

www.hawaiianelectric.com

Press Release for Maui Electric Company's DC fast charger



**Maui
Electric**

NEWS RELEASE

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FOR IMMEDIATE RELEASE
June 18, 2014

Maui Electric offers island's first "open access" electric vehicle charging station

KAHULUI, MAUI – Maui Electric today announced the debut of an electric vehicle (EV) charging station at its Kahului office at 210 W. Kamehameha Avenue.

Open to the public 24/7, the DC Fast Charger at Maui Electric can fully charge an EV in 15 to 30 minutes. It is the first "open access" charging station on Maui, meaning drivers are not required to sign up for a membership or subscription to use the charger.

The charger is also the first on island to offer variable pricing for time of day and day of the week charging and various payment options, including credit cards via mobile apps, RFID cards, and pay-by-phone or card swipe.

The charging station is part of a pilot program at Maui Electric to advance the adoption of more electric vehicles on the island.

"As the EV population grows on Maui, we wanted to provide flexibility and choices," said Troy Connatser, customer designer at Maui Electric. "Having options, like variable pricing, will also hopefully encourage customers to charge EVs during different times of the day. For instance, when general load is low but more variable clean energy sources, such as wind and solar, may be available."

The DC Fast Charger is supplied by ABB and is operated in partnership with Greenlots, a global provider of open standards-based technology solutions for electric vehicle (EV) networks.

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Company GoEV Website

Schedule EV-F (commercial account for high demand charging with separate meter)

Schedule EV-F allows commercial customers to have separately metered EV public charging infrastructure on a time of use rate without a demand charge.

Commercial customers enrolling on Schedule EV-F will have a new EV-F meter exclusive for EV charging up to 100 kW. There may be no more than 5 kW of ancillary load, to allow for services exclusively for the charging station such as lighting, monitoring, and point of sale equipment. The customer's existing load will remain on existing meter(s). There is a \$5.00 monthly metering charge. The customer must hire a licensed electrician to install and connect the new meter infrastructure. Schedule EV-F has no demand charge during any of the time-of-use periods. The lowest rates will be offered from 9 p.m. to 7 a.m.

COMMERCIAL RATE CUSTOMERS - Demand Service

Rate	Time of Day (Weekday)	Time of Day (Weekend)	Cost/kilowatt-hour
Off-Peak rates	9:00 p.m. to 7:00 a.m.	9:00 p.m. to 7:00 a.m.	10 cents above typical rates
Mid-Peak rates	7:00 a.m. to 5:00 p.m.	7:00 a.m. to 9:00 p.m.	13 cents above typical rates
Priority-Peak rates	5:00 p.m. to 9:00 a.m.	not applicable	15 cents above typical rates

A permit will be required for the electrical work for the installation of the new, separate meter for EV-F. Permit closure is required before EV-F rate enrollment.

Hawaiian Electric Companies' Electric Vehicle (EV) Pilot Rate Schedule EV-F is open to 100 customers on Oahu, 40 in Maui County, and 40 on Hawaii Island for public Level 2 or DC Fast Charging accounts. The pilot will be in effect until June 2018.

Detailed rate schedule information:

[-Schedule EV-F \(commercial-separate meter for EV charging only\)](#)