



March 31, 2021

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

Dear Commissioners:

Subject: Transmittal No. 13-07 (non-docketed) – Schedule EV-F and EV-U
Hawaiian Electric's Annual Report

Pursuant to Ordering Paragraph 1.C of Decision and Order No. 31338, filed July 1, 2013 in regard to Transmittal Nos. 13-07 and 13-08 (consolidated), as modified by Decision and Order No. 34592, filed June 2, 2017 in Docket No. 2016-0168, Hawaiian Electric¹ respectfully submits its *Annual Report on the Progress and Status of the Commercial Public Electric Vehicle Charging Service Pilot Rates*.²

Sincerely,

/s/ Kevin M. Katsura

Kevin M. Katsura
Director
Regulatory Non-Rate Proceedings

Attachment

cc: Consumer Advocate (w/attachment)

¹ Hawaiian Electric Company, Inc., Maui Electric Company, Limited, and Hawai'i Electric Light Company, Inc. are each doing business as "Hawaiian Electric" and have jointly registered "Hawaiian Electric" as a trade name with the State of Hawai'i Department of Commerce and Consumer Affairs.

² In accordance with Order No. 37043 *Setting Forth Public Utilities Commission Emergency Filing and Service Procedures related to COVID-19* (non-docketed), issued by the Commission on March 13, 2020, the Company is serving this filing on the Consumer Advocate via email.

Hawaiian Electric's 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, 2021

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Executive Summary

In 2020, Hawaiian Electric continued to build upon its growing momentum in electrification of transportation (“EoT”), with the development of programs and actions keeping pace with the growing population of electric vehicle (“EV”) drivers.¹ The Company’s various efforts align with the *Electrification of Transportation Strategic Roadmap* (“Roadmap”),² which provides key near-term steps, benefit and cost analyses, and ten EoT Initiatives. These initiatives will contribute to the State’s clean energy vision and create economic benefits for all customers.

The Company’s public charging efforts discussed herein align with “Initiative # 7 – Expand availability of public charging,” in the Roadmap, which recommends accelerating the buildout of charging infrastructure to provide “a critical backbone of reliable, public utility-owned charge stations as the launching point from which the broader electric transportation and third-party charging market in Hawai’i can expand and solidify.”³ Hawaiian Electric filed its *Critical Backbone Study: Planning Methodology* (“Backbone Study”) on July 30, 2019, further informing the development of charging infrastructure to support the adoption of EVs.⁴ All company-owned sites and installations moving forward since January 2020, are supported by the Backbone Study showing a need for chargers in those locations. In accordance with Order No. 36448 issued on July 31, 2019, the Company filed a Workplan on October 29, 2019 describing the near-term actions to evaluate a suite of EV rates and developing make-ready infrastructure pilot programs.⁵ On July 10, 2020, the Company filed its *Application For Approval of the eBus Make-Ready Infrastructure Pilot Project* in Docket No. 2020-0098. On September 30, 2020, the Company filed its *Application For Approval to Establish Electric Vehicle Tariffs for Schedule EV-J – Electric Vehicle Charging Service – Demand and Schedule EV-P – Electric Vehicle Charging Service – Large Demand, on a Pilot Basis* in Docket No. 2020-0152. Lastly, on December 4, 2020, the Company filed its *Application For Approval of the Charge Ready Hawai’i Pilot Project* in Docket No. 2020-0202.

Executing on the Roadmap Initiative #7, key highlights in 2020 include:

- Expanded the Company’s Direct Current Fast Charge (“DCFC”) network by six additional charge stations, four on Maui (under the EV-MAUI tariff), one on O’ahu and one on Hawai’i Island⁶;
- Overall utilization increased from 2019 to 2020, reflecting a 17.7 percent increase in amount of energy consumed for a total of 412,017 kilowatt-hours (“kWh”) during 27,734 total sessions; and
- Overall 58% of the energy provided through Schedule EV-U in 2020 occurs during the mid-day period of 9 AM-5 PM.

¹ Hawaiian Electric Company, Inc., Hawai’i Electric Light Company, Inc., and Maui Electric Company, Limited are collectively referred to herein as “Hawaiian Electric” or the “Company.”

² Docket No. 2018-0135, Decision & Order No 3452 filed March 29, 2018 and updated November 29, 2018.

³ Docket No. 2018-0135, Electrification of Transportation Strategic Roadmap filed March 29, 2018 at 7.

⁴ Docket No. 2018-0315, Electrification of Transportation Electric Vehicle Critical Backbone Study: Planning Methodology filed July 30, 2019.

⁵ Docket No. 2018-0315, Electrification of Transportation Strategic Roadmap Companies’ Electrification of Transportation Workplan filed October 29, 2019.

⁶ The EV-MAUI Annual Report will be filed separately by March 31, 2021.

Background

2020 was the seventh full year of this pilot program,⁷ and this report provides year ending December 31, 2020 information on the status of implementing Schedule EV- U: Commercial Public Electric Vehicle Charging Service and Schedule EV-F: Commercial Public Electric Vehicle Facility Charging Service Pilot.⁸

Initially in 2013, Schedule EV-U was intended to support the EV market by allowing the Company 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-unit dwellings (“MUDs”). Schedule EV-F was intended to support clean energy goals by encouraging “the development of public EV charging facilities by pricing electricity at levels that are lower than Schedule EV-C⁹ and Schedule J at lower energy consumption levels for start-up EV public charging operators.”¹⁰

In mid-2016, the Company requested to extend the termination date of the pilot program.¹¹ A year later,¹² the Commission approved a five-year extension of the pilot program and request to convert the rate from a fixed fee rate to a volumetric rate on the condition that the Company submit revised rate structures for Schedule EV-U and Schedule EV-F within ninety days and comply with applicable requirements.¹³ On December 12, 2017, the Company implemented the revised rate structure for Schedules EV-U and EV-F for all participating accounts.¹⁴

⁷ On July 3, 2013, in accordance with Decision and Order No. 31338, Hawaiian Electric filed its commercial rates Schedule EV-F and Schedule EV-U to be effective July 4, 2013.

⁸ In accordance with Ordering Paragraph 1.C. of Decision and Order No. 31338, filed July 1, 2013 in Transmittal Nos. 13-07 and 13-08 (consolidated), as explicitly modified by Decision and Order No. 34592 (“D&O 34592”), filed June 2, 2017 in Docket No. 2016-0168.

⁹ By Decision and Order No. 33165 issued on September 25, 2015, the Commission approved “the Companies’ request to terminate Schedule EV-C, as of October 1, 2015” and “suspend[ed] the Companies’ request to establish their proposed Schedules TOU EVD, EV-RD, and EV-CD.”⁹ Therefore, as of October 1, 2015 Schedule EV-F is the only commercial EV rate available for EV charging services.

¹⁰ Transmittal No. 13-07 at 22.

¹¹ On June 27, 2016, the Company filed a request to extend the termination date for Schedule EV-F and Schedule EV-U from June 30, 2018 to June 30, 2028. On July 5, 2016, the Commission issued Order No. 33783 and opened Docket No. 2016-0168 for the purpose of reviewing the Company’s request. On September 15, 2016, the Commission issued Order No. 33918, establishing the procedural schedule. On November 18, 2016, the Company filed its Reply Statement of Position thereby completing the procedural schedule.

¹² On June 2, 2017, the Commission issued D&O 34592, approving a five-year extension of the pilot.

¹³ The Commission provided further guidance that the revised rate structures for Schedule EV-F and Schedule EV-U should (1) align Schedule EV-F and Schedule EV-U to TOU rates developed within Docket No. 2014-0192, (2) “incorporate lessons learned from time-of-use rates and demand response initiatives”¹³ into the revised rate structures, (3) contemplate various business and EV charging models that may be facilitated through various technologies, and (4) be “proactive in proposing revised rate structures and tariffs as research, technology, and market-related changes occur.”¹³ The Commission also required the Company to include discussion on efforts to forecast anticipated utilization in subsequent EV charging deployments and how costs for EV charging deployments have been and are anticipated to be recovered from customers.¹³ On September 5, 2017, the Company submitted revised rate structures and accompanying tariff sheets for Schedules EV-F and EV-U. On October 13, 2017, the Commission issued Order No. 34867, approving the Company’s revised tariff sheets for Schedules EV-F and EV-U, to be implemented within 60 days.

¹⁴ Rate Schedules EV-F and EV-U currently align to the guidance provided by the Commission in D&O 34592 by providing the lower energy cost during the Mid-Day period. The time-of-use periods are currently: On-Peak: 5:00 p.m.-10:00 p.m., Daily; Mid-Day: 9:00 a.m.-5:00 p.m., Daily; Off-Peak: 10:00 p.m.-9:00 a.m., Daily.

Schedule EV-U is currently a variable rate based on electricity consumption, and includes incremental costs for network fees, non-labor operations and maintenance (“O&M”) and customer surcharges.¹⁵ The intent of the revised rate structure is to charge customers based on their actual electricity consumption, while aligning to a time-of-use (“TOU”) structure that reflects system needs and incorporating additional pilot costs to alleviate some of the cost shift between participating EV customers and the Company’s broader customer base as a whole.

Schedule EV-U Tariff

Adoption of EV-U and status of Schedule EV-U Tariff

Despite the COVID-19 Pandemic, electric vehicle usage continued to grow in 2020, with the adoption of passenger EVs increasing by 24 percent in the Company’s service territory as shown in Figure 1 below.¹⁶ Despite this growth, EVs still only represent approximately one percent of the overall passenger vehicles registered in the State.¹⁷ The EV market remains nascent, but is anticipated to experience tremendous growth in the next few decades based on the Company forecast that one in every two vehicles will be electric by 2045.¹⁸

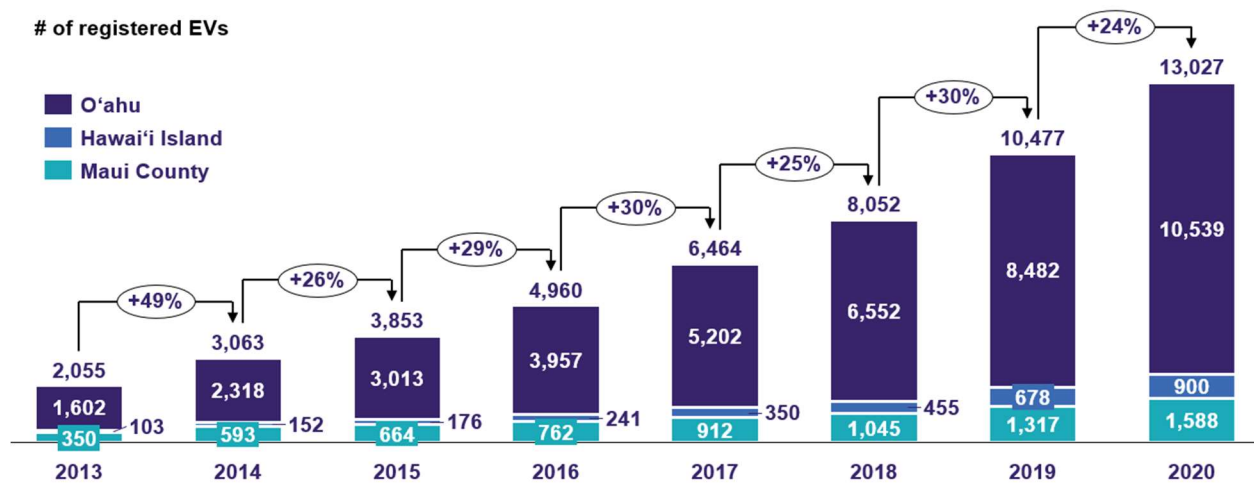


Figure 1 Electric vehicle adoption¹⁹ in the Company’s service territory since the start of the pilot program.

In 2017, the Commission approved the Company’s request to extend the EV-U and EV-F pilot program for an additional five years,²⁰ allowing the Company additional time to implement the authorized fast

¹⁵ See Revised Rate Structures for Schedules EV-F and EV-U, filed on September 5, 2017 Attachment 1 at 8-9.

¹⁶ Source is based upon estimated corrected data from <http://dbedt.hawaii.gov/economic/energy-trends-2/>. The Energy Trends data had vehicle registration issues for the months of October 2019 to December 2019. The estimated corrections were based upon calculated linear incremental EV adoption between September 2019 and January 2020.

¹⁷ Source <http://dbedt.hawaii.gov/economic/energy-trends-2/>

¹⁸ Docket No. 2018-0135, Electrification of Transportation Strategic Roadmap filed June 18, 2018 at 34.

¹⁹ 2019 EV registration is based upon an estimated correction to Energy Trends EV registration data.

²⁰ Docket No. 2016-0168, Decision & Order No. 34592 filed June 2, 2017. The original pilot was scheduled to end in 2018.

charging stations under 25 accounts and collect data to evaluate the impact of the program as well as the efficacy of the approved rates. As displayed in Figure 2 below, the Company has installed and operated 76 percent of the charging stations allowed in the pilot program to date, including two new additions in 2020 — one on O’ahu and one on Hawai’i Island. At the time of writing this report, two additional stations were installed on O’ahu, one at Salt Lake Shopping Center and one at Waipio Shopping Center, which will bring the total number of EV-U chargers to 21. The Company is targeting to install the remaining four approved charge stations in 2021.

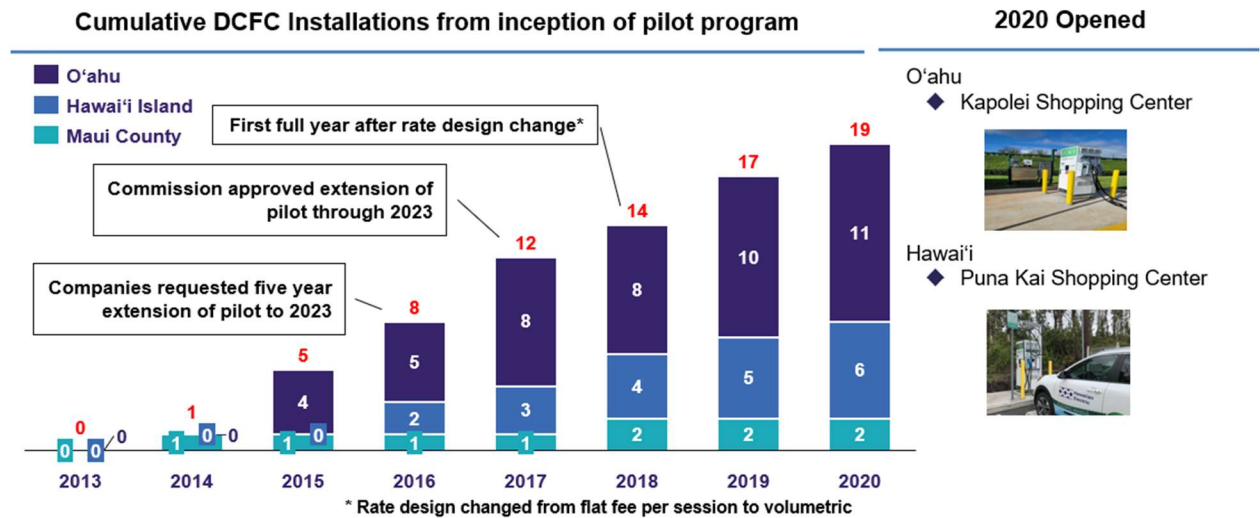


Figure 2 Summary of DCFC stations installed since inception of the pilot program in 2013.

	Initial approval (5 years)								Extension approved in 2017 (+5 years)		
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
O'ahu	0	0	4	1	3	0	2	1	5	0	0
Hawai'i Island	0	0	0	2	1	1	1	1	1	0	0
Maui	0	1	0	0	0	0	0	0	0	0	0
Moloka'i	0	0	0	0	0	1	0	0	0	0	0
Lāna'i	0	0	0	0	0	0	0	0	0	0	0
Annual Total	0	1	4	3	4	2	3	2	6	0	0
Cumulative Total	0	1	5	8	12	14	17	19	25	25	25

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
O'ahu			Dole Koolau Kapolei Hawaii-Kai	Ward 1	Ward 2 Waianae Dillingham		Waimalu Times Square SC Haleiwa Town Center	Kapolei SC	Continue to work with site owners to install charge stations as soon as possible, allowing the Companies time to evaluate changes introduced as part of the pilot program		
Hawai'i Island				HELCO-Hilo HELCO-Kona	Waimea	Shops at Mauna Lani	Punaluu	Puna Kai Shopping Center			
Maui		MECO Kahului									
Moloka'i						Kaunakakai					
Lāna'i											

Estimated—subject to change

Figure 3 Historic and forecasted levels of installation of the twenty-five allowed charge stations.

Utilization across the Company's Service Territory

The overall number of charging sessions and amount of energy consumed (measured in kWh) across the service territory are shown below in Figures 4 and 5, respectively. In 2020, the COVID pandemic may have adversely affected the level of growth due to people working from home and not needing the DCFC for their daily commute to and from work. This assumption is supported by the decrease in aggregated DCFC use shown in Figure 4 with the lowest numbers occurring in April 2020. The DCFC data after April, however, shows charging resumed and monthly utilization surpassed utilization in January through March (pre-COVID lockdown). The slight dip in September aligns with a second stay-at-home mandate, which also recovered with increased monthly utilization and total annual increased utilization of 17.7% as compared to 2019.

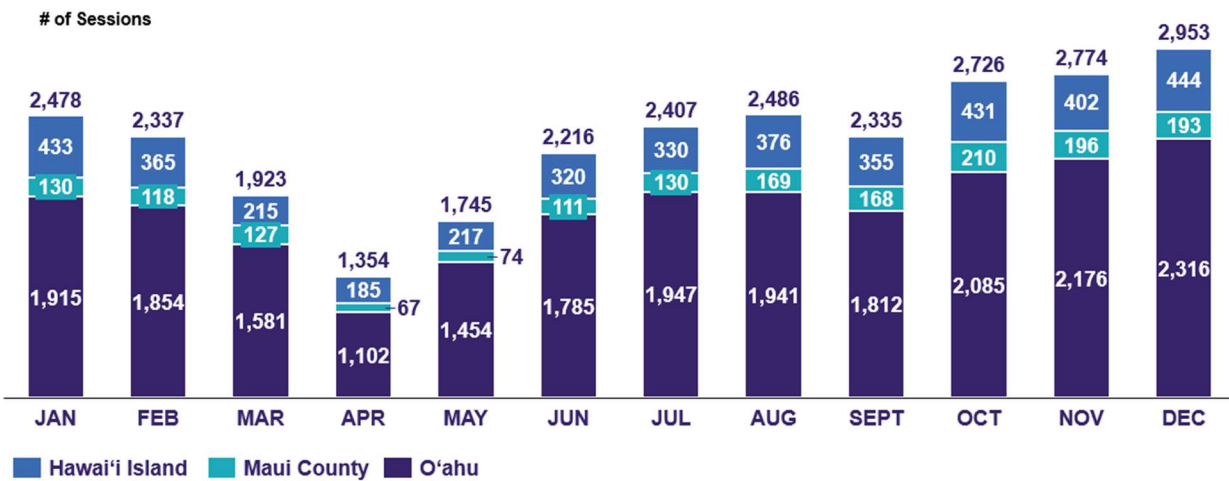


Figure 4 Monthly summary of all three utilities' utilization by number of sessions for 2020.

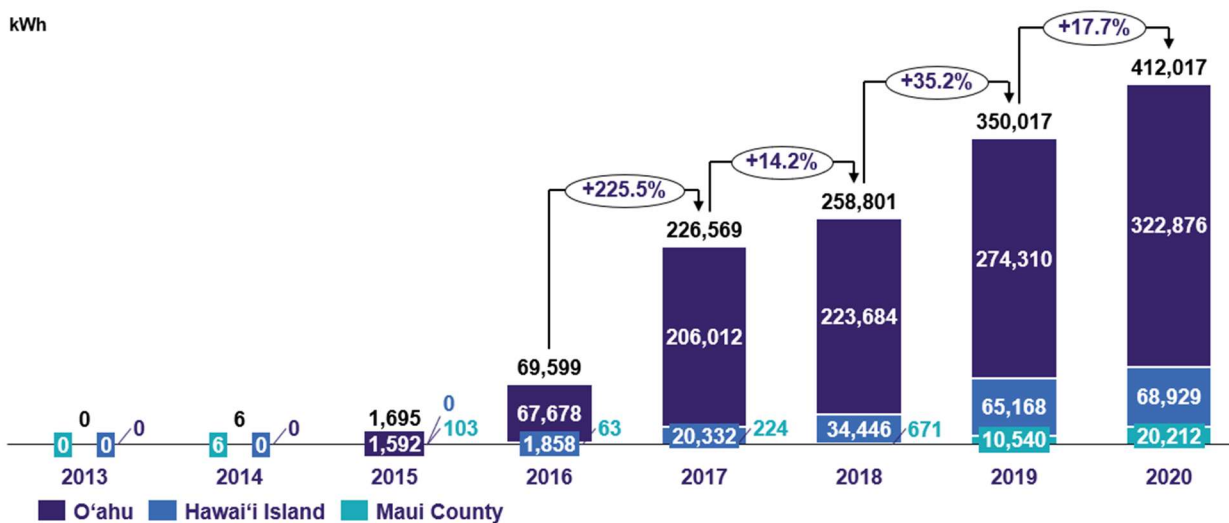


Figure 5 Summary of all three utilities' utilization by energy consumed (kWh) annually from 2013 through 2020.

On November 1, 2018, the Company launched a partnership with Nissan North America and Greenlots, Inc. to host the No Charge to Charge (“NCTC”) program in its service territory. The NCTC program provides drivers up to two years of complimentary fast charging through the Greenlots charging network, with a qualifying purchase or lease of a new Nissan LEAF on or before July 7, 2019 from LEAF-certified Nissan dealers in Hawai‘i.²¹ The Companies are compensated and reflect revenue for NCTC sessions based upon the rate Schedule EV-U. A summary of the number of NCTC sessions in 2020 by location is illustrated in

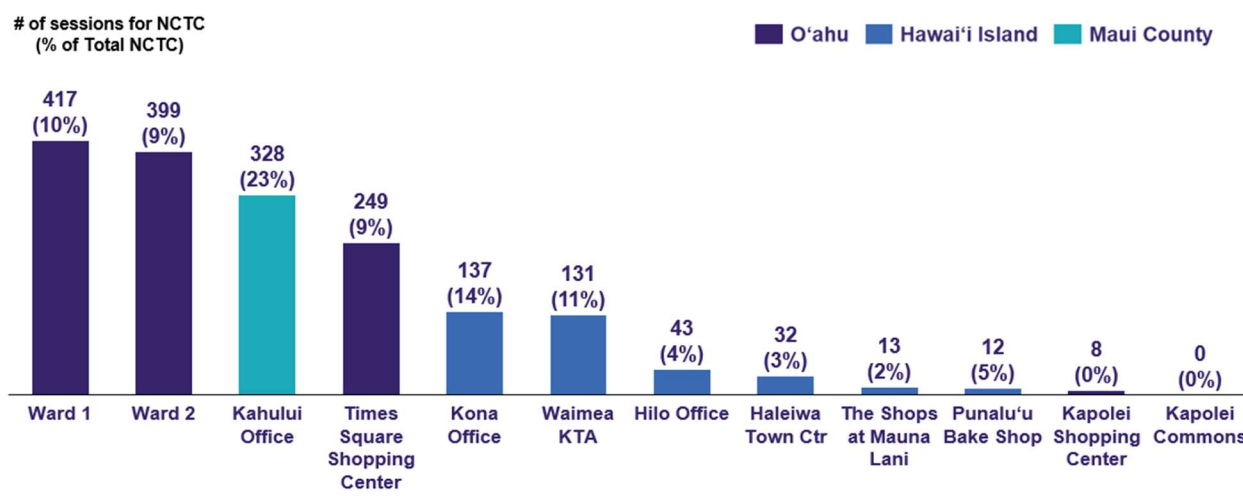


Figure 6 below and the energy consumption of the NCTC sessions in 2020 by location is shown in Figure 7 below. NCTC session comprised only six percent of all sessions in 2020. These charging sessions are included in the Company’s reported data that follows. The NCTC program ends on July 7, 2021 which makes 2020 the last full year of the program.

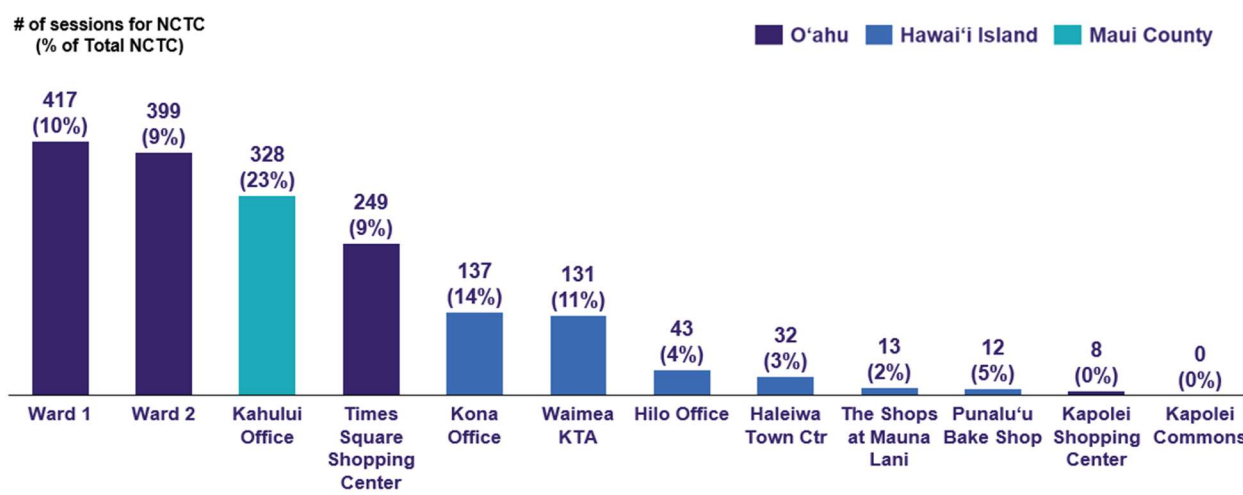


Figure 6 Number of 2020 No Charge to Charge (“NCTC”) Sessions.

²¹ <https://www.evgo.com/special-offers/nissan-no-charge-charge/>.

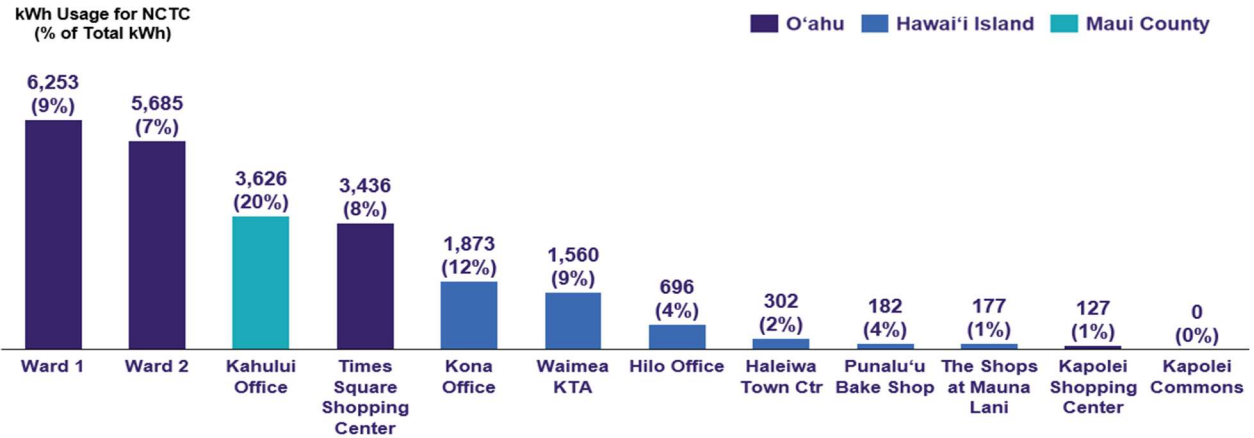


Figure 7 Energy Consumption of 2020 No Charge to Charge (“NCTC”) Sessions.

Utilization on O’ahu

One additional charge station was installed on O’ahu in 2020. The monthly overall utilization for the EV-U DCFE sites on O’ahu is shown in Figure 8 through 11 below.

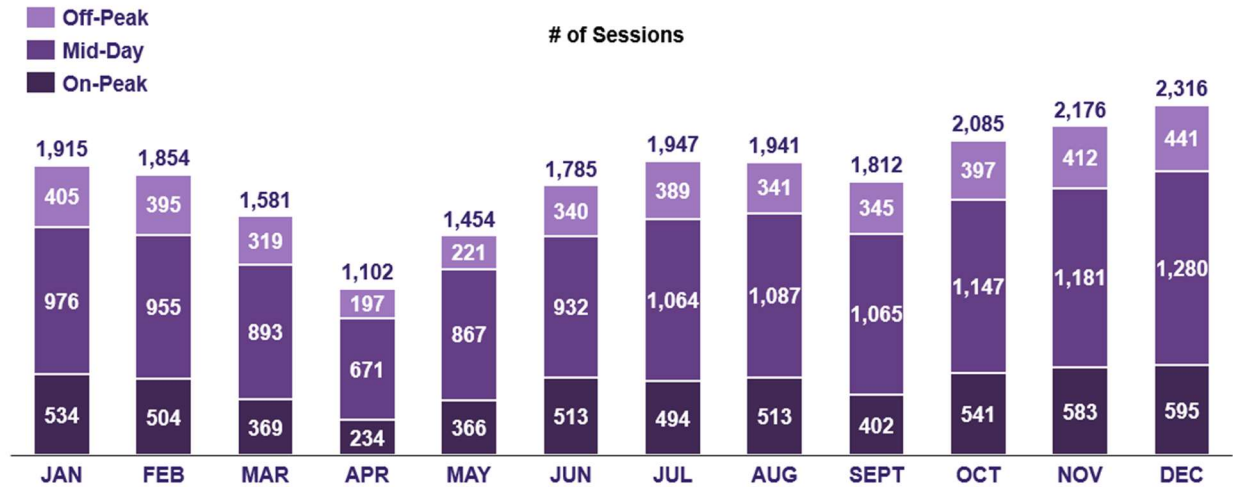


Figure 8 Monthly utilization on O’ahu for 2020 for all eleven DCFE sites by TOU.

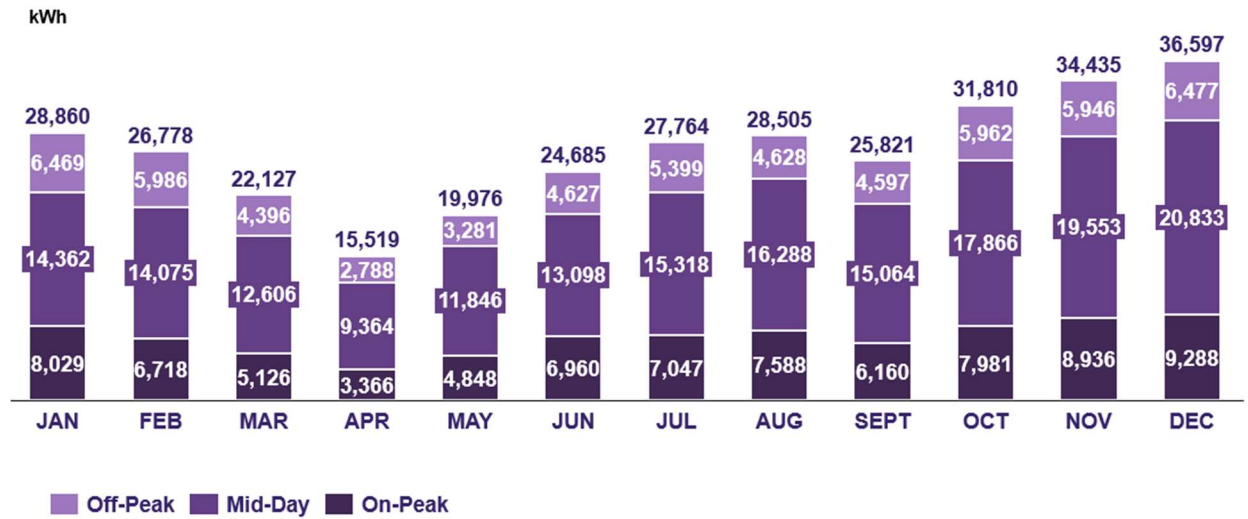


Figure 9 monthly consumption by energy consumed (kWh) on O’ahu for 2020 for all eleven DCFC sites by TOU.

In 2020, the O’ahu fast charging stations accounted for 79 percent of all the charge sessions in the pilot, reflecting the preponderance of EVs in the City and County of Honolulu, which comprises 81 percent of all the EVs registered in the Company’s service territory.

The Kapolei Commons DCFC shows no usage due to equipment issues and was no longer supported by the manufacturer. In late 2020, the Kapolei Commons charger was replaced and made available to the public in January 2021. The 2021 annual report will reflect usage at the replacement charger. Additionally, in 2020, the Company installed a DCFC at the Kapolei Shopping Center which became publicly available in January 2020. Co-located chargers, Ward 1 and Ward 2 chargers continue to be the highest utilized stations on Oahu.

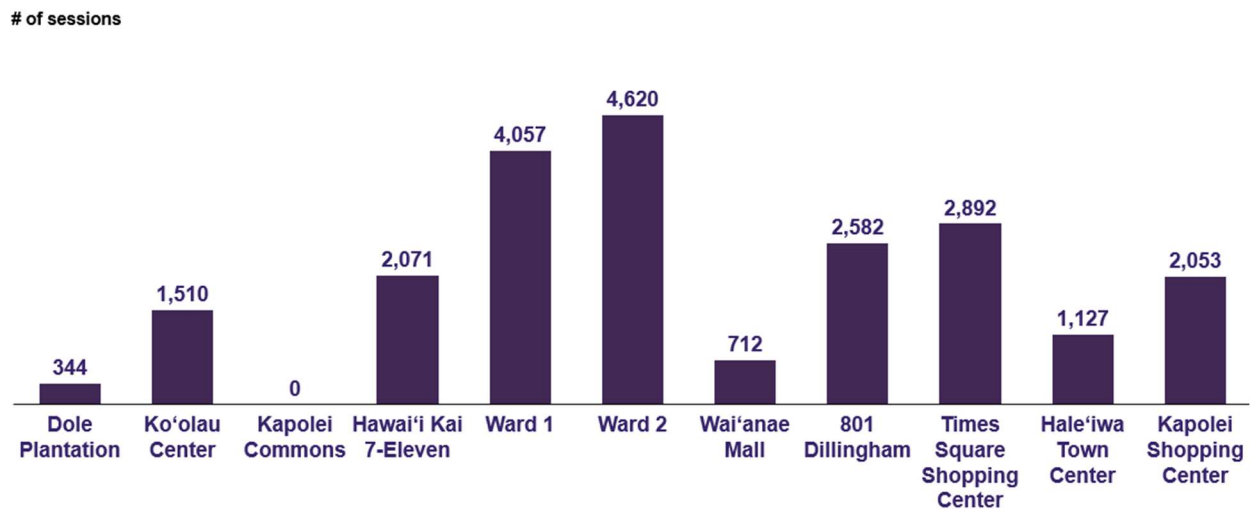


Figure 10 Annual utilization on O’ahu for 2020 by DCFC site.

Figure 11 below shows the annual energy consumption on O’ahu by site for 2020.

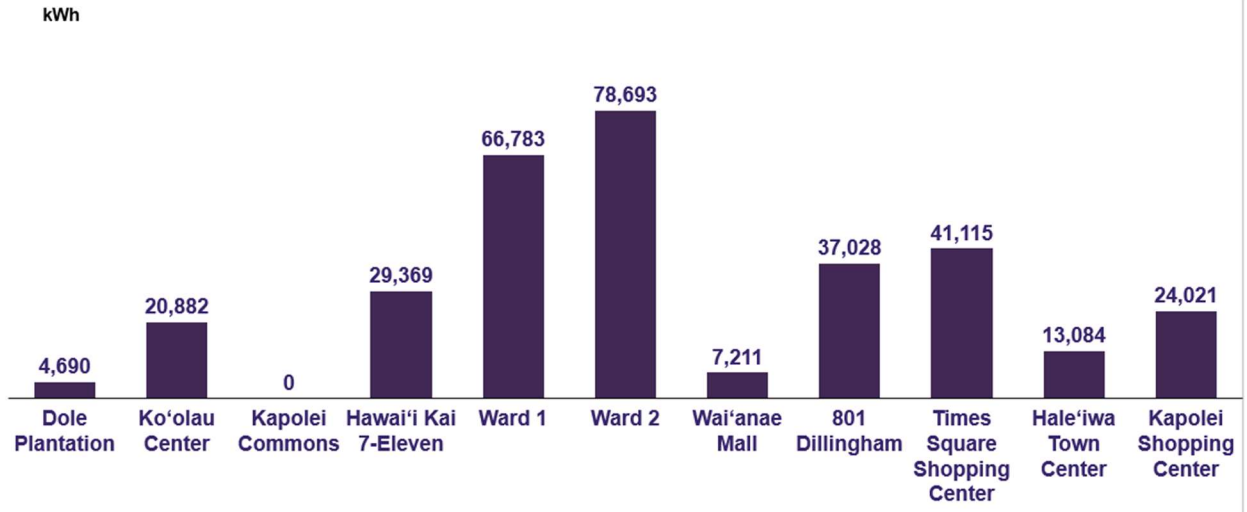


Figure 11 Annual energy consumption on O’ahu for 2020 by DCFC site.

A summary for each DCFC site is provided below with aggregated summaries of all EV-U DCFC provided in Appendix A.

Dole Plantation

While the DCFC station at Dole Plantation is not located near residential neighborhoods, this strategic tourist location is one of the major thoroughfares to the North Shore of O’ahu, which has little availability of public EV charging.

Usage period analysis shows that most of the charge sessions at this location continue to be during the Mid-Day period. Mid-Day sessions comprised 83 percent of all sessions, which is the highest percentage of the charge stations on O’ahu. This result may be partially attributed to Dole Plantation’s business hours of 9:30 a.m. to 5:30 p.m., although access to this charge station is sometimes extended beyond normal business hours.

This DCFC is located on private property where business has been closed for most of 2020 due to COVID-19 stay-at-home orders. As a result, the utilization of this station was significantly impacted. On November 12, 2020, business reopened and the DCFC was available to the public six days a week with shortened business hours from 10 am to 4 pm. Hawaiian Electric provided updates of the charger status to EV drivers on their website and on PlugShare.com.

Figure 12 below summarizes the key statistics collected for the Dole Plantation site in 2020.

Dole		2020
% utilization		
	Off-Peak	10%
	Mid-Day	83%
	On-Peak	7%
Energy (kWh) per session		
	Off-Peak	10
	Mid-Day	14
	On-Peak	13
Gross Revenue (\$) per session		
	Off-Peak	5.64
	Mid-Day	6.89
	On-Peak	7.38
Minutes (min) per session		
	Off-Peak	21
	Mid-Day	27
	On-Peak	22

Figure 12 Comparison of Dole Plantation site statistics for 2020.

Ko'olau Center

Similar to Dole Plantation, Ko'olau Center is on a thoroughfare that provides access to the north side of O'ahu where there are limited public charging options. Although there are more sessions during the Mid-Day, energy consumption and duration of charge sessions show little variability across all time periods.

Figure 13 below summarizes the key statistics collected for Ko'olau Center site in 2020.

Ko'olau		2020
% utilization		
	Off-Peak	16%
	Mid-Day	58%
	On-Peak	26%
Energy (kWh) per session		
	Off-Peak	14
	Mid-Day	14
	On-Peak	12
Gross Revenue (\$) per session		
	Off-Peak	7.61
	Mid-Day	7.09
	On-Peak	6.98
Minutes (min) per session		
	Off-Peak	28
	Mid-Day	30
	On-Peak	26

Figure 13 Comparison of Ko'olau Center site statistics for 2020.

Kapolei Commons

This station was a CHAdeMO-only charge station situated in a shopping center in close proximity to large residential neighborhoods along a major highway thoroughfare. This shopping center also provides Level 2 charging from other third-party operators. This station was out of commission since the second half of 2019 and needed a complete replacement because the charger was no longer supported by the manufacturer.

In 2020, the Company upgraded electrical service from 208V to 480V to support a new DCFC with two connectors (CHAdeMO and CCS) standards. There was no charging data available in 2020 since the old station was taken out of service, and the new charger did not become available to the public until it was placed in service in January 2021.

Figure 14 below reflects no data was collected for the Kapolei Commons site in 2020.

Kapolei Commons		2020
% utilization		
	Off-Peak	NA – Station out of service
	Mid-Day	NA – Station out of service
	On-Peak	NA – Station out of service
Energy (kWh) per session		
	Off-Peak	NA – Station out of service
	Mid-Day	NA – Station out of service
	On-Peak	NA – Station out of service
Gross Revenue (\$) per session		
	Off-Peak	NA – Station out of service
	Mid-Day	NA – Station out of service
	On-Peak	NA – Station out of service
Minutes (min) per session		
	Off-Peak	NA – Station out of service
	Mid-Day	NA – Station out of service
	On-Peak	NA – Station out of service

Figure 14 Comparison of Kapolei Commons site statistics for 2020.

Hawai'i Kai 7-Eleven

This charge station is located amongst residential houses and condominiums. Its proximity to condominiums may contribute to its continued high utilization. EV owners living in condominiums and townhouses without a garage often need to rely on public charging stations, such as this one, for their vehicle charging needs.

55 percent of the sessions started during the Mid-Day, 19 percent started during the Off-Peak and 26 percent started during the On-Peak.

Figure 15 below summarizes the key statistics collected for the Hawai'i Kai 7-Eleven site in 2020.

7-Eleven		2020
% utilization		
	Off-Peak	19%
	Mid-Day	55%
	On-Peak	26%
Energy (kWh) per session		
	Off-Peak	13
	Mid-Day	13
	On-Peak	17
Gross Revenue (\$) per session		
	Off-Peak	7.12
	Mid-Day	6.56
	On-Peak	9.48
Minutes (min) per session		
	Off-Peak	29
	Mid-Day	30
	On-Peak	33

Figure 15 Comparison of Hawai'i Kai 7-Eleven site statistics for 2020.

Ward 1

DCFC stations Ward 1 and Ward 2 are co-located at the Hawaiian Electric building on Ward Avenue. It is situated near the growing density of high-rise condominiums, many office buildings, and the downtown Honolulu district. These two charge stations comprise the only DC fast charging hub on the island of O’ahu, and it is currently the only location that can provide two simultaneous 50 kW DCFC sessions in the State. The location and reliance on co-located DCFC stations may account for their high utilization. Combined, they make up 39 percent of all charge sessions on O’ahu and 31 percent of all stations in this DCFC pilot based on 2020 data. Ward 1 and Ward 2 (below) also have the highest energy (kWh) per session in the Mid-Day than all other O’ahu DCFC locations.

Ward 1 is the second highest utilized charge station in the pilot in 2020. The Mid-Day utilization was 53 percent in 2020, while 21 percent of all sessions started during the Off-Peak period, and 26 percent of all sessions started during the On-Peak period.

Figure 16 below summarizes the key statistics collected for Ward 1 site in 2020.

Ward 1		2020
% utilization		
Off-Peak		21%
Mid-Day		53%
On-Peak		26%
Energy (kWh) per session		
Off-Peak		15
Mid-Day		17
On-Peak		16
Gross Revenue (\$) per session		
Off-Peak		8.17
Mid-Day		8.48
On-Peak		9.01
Minutes (min) per session		
Off-Peak		31
Mid-Day		33
On-Peak		30

Figure 16 Comparison of Ward 1 site statistics for 2020.

Ward 2

As noted above, the Ward 2 DCFC station is co-located with Ward 1 at the Hawaiian Electric office on Ward Avenue. Ward 2 is the most utilized charge station in the EV- U pilot and accounts for about 17 percent of all 2020 charge sessions in the pilot.

The Mid-Day utilization was 52 percent in 2020, while 22 percent of all sessions started during the Off-Peak, and 26 percent of all sessions started during the On-Peak.

Figure 17 below summarizes the key statistics collected for Ward 2 site in 2020.

Ward 2	2020
% utilization	
Off-Peak	22%
Mid-Day	52%
On-Peak	26%
Energy (kWh) per session	
Off-Peak	17
Mid-Day	17
On-Peak	17
Gross Revenue (\$) per session	
Off-Peak	9.12
Mid-Day	8.43
On-Peak	9.58
Minutes (min) per session	
Off-Peak	33
Mid-Day	33
On-Peak	33

Figure 17 Comparison of Ward 2 site statistics for 2020.

Wai'anae Mall

This charge station is located at a shopping center amongst restaurants and stores, and near residential neighborhoods along a highway thoroughfare. While it has one of the lowest utilizations of all Hawaiian Electric DCFC stations on O'ahu, it is currently the westernmost public charging station of any type along Farrington Highway on the west side of the island. This location provides EV drivers assurance they can travel to and from the leeward coast and encourages EV adoption in this important area.

This charge station has relatively high Mid-Day utilization, which may in part be due to its convenient shopping center location. In 2020, 60 percent of its charge sessions started during the Mid-Day, 22 percent of all sessions started during the Off-Peak, and 28 percent of all sessions started during the On-Peak.

Figure 18 below summarizes the key statistics collected for Wai'anae Mall site in 2020.

Wai'anae Mall		2020
% utilization		
	Off-Peak	22%
	Mid-Day	60%
	On-Peak	18%
Energy (kWh) per session		
	Off-Peak	9
	Mid-Day	11
	On-Peak	10
Gross Revenue (\$) per session		
	Off-Peak	4.73
	Mid-Day	5.24
	On-Peak	5.67
Minutes (min) per session		
	Off-Peak	31
	Mid-Day	25
	On-Peak	20

Figure 18 Comparison of Wai'anae Mall site statistics for 2020.

801 Dillingham

This charge station has one of the lowest Off-Peak utilizations on O’ahu.

In 2020, 60 percent of all sessions started during the Mid-Day, 13 percent of its charge sessions started during the Off-Peak, and 27 percent of all sessions started during the On-Peak.

Figure 19 below summarizes the key statistics collected for the 801 Dillingham site in 2020.

Dillingham		2020
% utilization		
	Off-Peak	13%
	Mid-Day	60%
	On-Peak	27%
Energy (kWh) per session		
	Off-Peak	16
	Mid-Day	14
	On-Peak	13
Gross Revenue (\$) per session		
	Off-Peak	8.48
	Mid-Day	7.09
	On-Peak	7.63
Minutes (min) per session		
	Off-Peak	32
	Mid-Day	32
	On-Peak	29

Figure 19 Comparison of 810 Dillingham site statistics for 2020.

Times Square Shopping Center

The Waimalu Times Square Shopping Center DCFC opened to the public in January 2019. This location was selected due to its population density, high penetration of MUDs, resident commuters, jobs, and traffic density. While one dual-standard 50 kW DCFC was installed, the underlying electrical infrastructure was designed to support 150 kW. The Company employed this approach to enable future flexibility if/when technology or customer needs change. Extra capacity wiring enables the Company to easily install additional fast charge stations or upgrade to a higher powered DCFC station if deemed appropriate in the future.

In 2020, as the third highest utilized site on O’ahu, 53 percent of all sessions started during the Mid-Day, 20 percent of its charge sessions started during the Off-Peak, and 27 percent of all sessions started during the On-Peak.

Figure 20 below summarizes the key statistics collected for Times Square Shopping Center site in 2020.

Times Square		2020
% utilization		
	Off-Peak	20%
	Mid-Day	53%
	On-Peak	27%
Energy (kWh) per session		
	Off-Peak	16
	Mid-Day	14
	On-Peak	14
Gross Revenue (\$) per session		
	Off-Peak	8.41
	Mid-Day	6.78
	On-Peak	7.96
Minutes (min) per session		
	Off-Peak	31
	Mid-Day	30
	On-Peak	30

Figure 20 Times Square Shopping Center site statistics for 2020.

Haleiwa Town Center

The Haleiwa Town Center DCFC opened to the public in June 2019. This strategic location is expected to alleviate range anxiety and support EV adoption. Currently, there is only one public charging station within a ten-mile drive of this location, which is the DCFC at Dole Plantation. This DCFC station is expected to support residents and tourists driving to and through the North Shore community.

In 2020, with the 2nd highest Mid-Day usage on O’ahu, 62 percent of all sessions started during the Mid-Day, 14 percent of its charge sessions started during the Off-Peak, and 24 percent of all sessions started during the On-Peak.

Figure 21 below summarizes the key statistics collected for Haleiwa Town Center site in 2020.

Haleiwa Town		2020
% utilization		
Off-Peak		14%
Mid-Day		62%
On-Peak		24%
Energy (kWh) per session		
Off-Peak		13
Mid-Day		12
On-Peak		10
Gross Revenue (\$) per session		
Off-Peak		6.78
Mid-Day		5.84
On-Peak		5.86
Minutes (min) per session		
Off-Peak		23
Mid-Day		28
On-Peak		23

Figure 21 Haleiwa Town Center site statistics for 2020.

Kapolei Shopping Center

A fast charging station was constructed at Kapolei Shopping Center and opened to the public in January 2020. This strategic location is expected to alleviate range anxiety and support EV adoption. While one dual-standard 50 kW DCFC was installed, the underlying electrical infrastructure was designed to support 150 kW. The Company employed this approach to enable future flexibility if/when technology or customer needs change. Extra capacity wiring enables the Company to easily install additional fast charge stations or upgrade to a higher powered DCFC station if deemed appropriate in the future.

After one-year of servicing EV drivers on the west side of O’ahu, the energy consumption for this station ranks sixth amongst DCFC stations in this pilot. In 2020, 52 percent of all sessions started during the Mid-Day, 20 percent of its charge sessions started during the Off-Peak, and 28 percent of all sessions started during the On-Peak.

Figure 22 below summarizes the key statistics collected for Kapolei Shopping Center site in 2020.

Kapolei Shopping Center		2020
% utilization		
	Off-Peak	20%
	Mid-Day	52%
	On-Peak	28%
Energy (kWh) per session		
	Off-Peak	9
	Mid-Day	13
	On-Peak	12
Gross Revenue (\$) per session		
	Off-Peak	4.76
	Mid-Day	6.14
	On-Peak	7.00
Minutes (min) per session		
	Off-Peak	20
	Mid-Day	26
	On-Peak	25

Figure 22 Kapolei Shopping Center site statistics for 2020

2021 site development

The DCFC station at Kapolei Commons was replaced in late 2020 with a 50 kW, dual-standard charge station. Usage at the new Kapolei Commons DCFC will first be reflected in January 2021.

The Company is engaging in negotiations with at least one site on O’ahu. A Memorandum of Understanding (MOU) is expected to be completed under the Hawaii State Public Library System (HSPLS). Additional sites are being considered throughout the service territory to complete the last four

sites allowed in the EV-U pilot. Further supporting the EV charging network, new sites will also be supported by the Backbone Study showing additional need in that location. All of the new charger locations installed in 2020 and since were supported by the Backbone Study

Utilization on Hawai'i Island

In 2020, the DCFC stations on Hawai'i Island accounted for almost 15 percent of all sessions in the pilot. Hawai'i Island has about 7 percent of all the EVs registered in the Company's territory. Longer driving distances on the island still presents a need for public DCFCs for Hawai'i Island EV drivers.

One charging station was added on Hawai'i Island as part of the pilot in late 2020 at the Puna Kai Shopping Center. This addition further enhanced the network of charge stations, which brought the number of EV-U company-owned chargers on Hawai'i Island to six. As with the other sites in the pilot, the effects of COVID can be seen in April with the lowest utilization and energy disbursed.

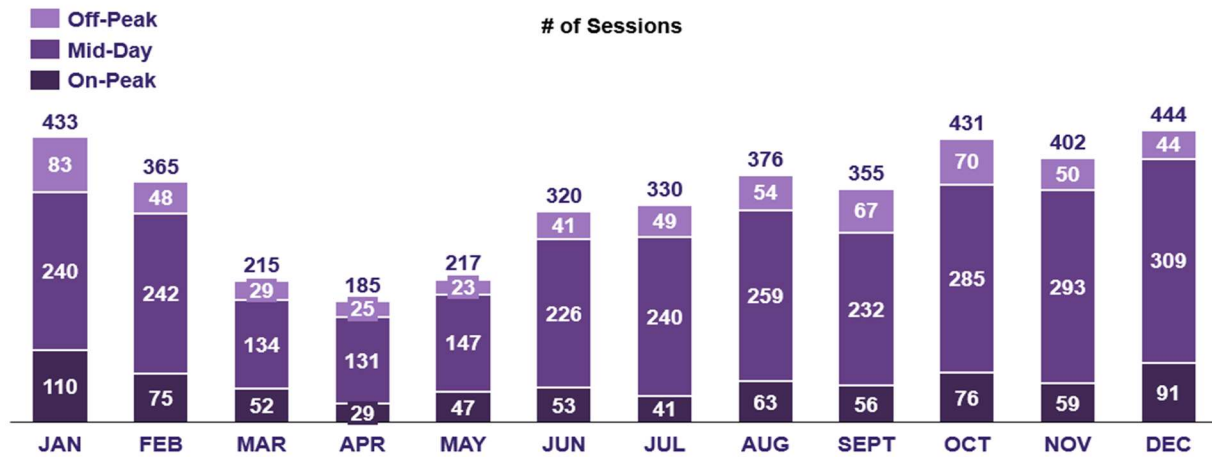


Figure 23 Monthly utilization on Hawai'i Island for 2020 for all six DCFC sites by TOU

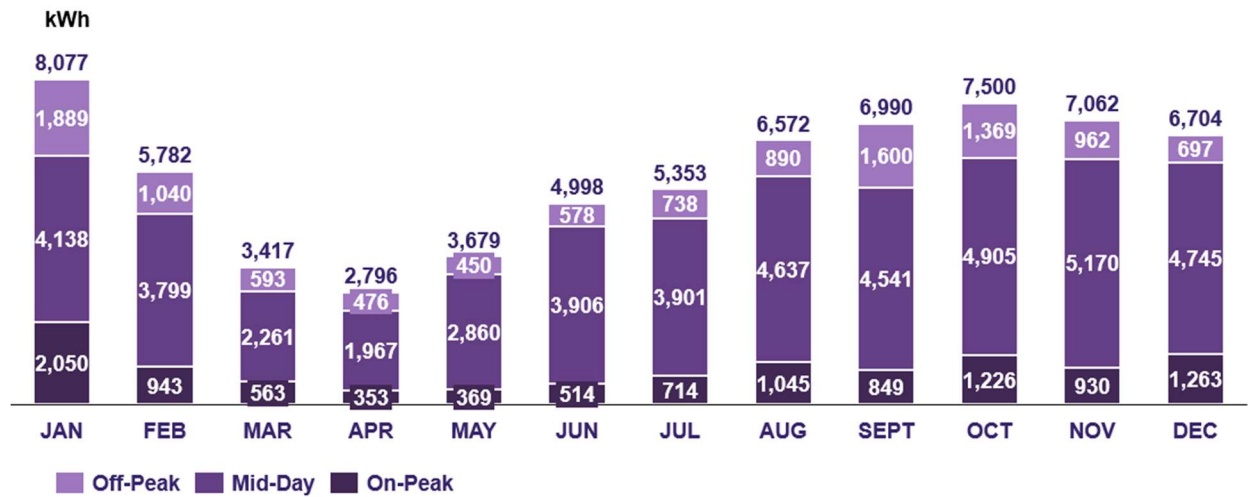


Figure 24 Monthly utilization by energy consumed (kWh) on Hawai'i Island for 2020 for all six DCFC sites by TOU.

The overall utilization for all locations on Hawai'i Island is shown in Figure 25 below.

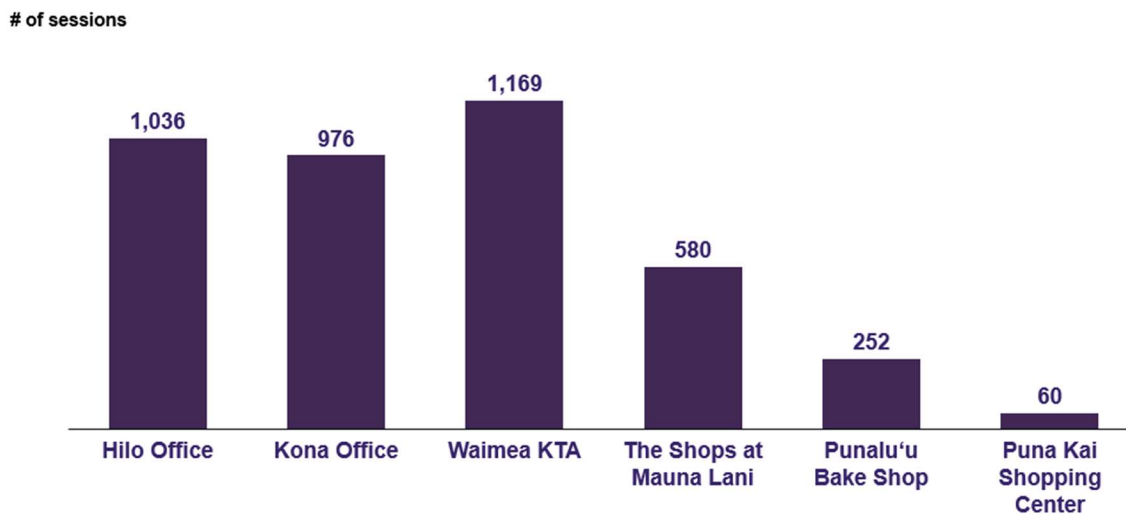


Figure 25 Annual utilization on Hawai'i Island for 2020 for all six DCFC sites.

The overall energy consumption for all locations on Hawai'i Island is shown in Figure 26 below.

kWh

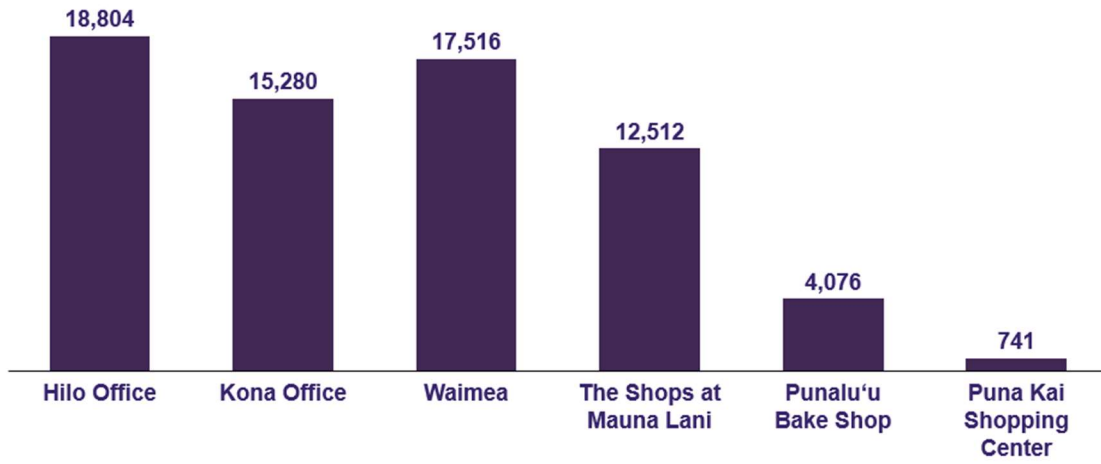


Figure 26 Annual energy consumption on Hawai'i Island for 2020 for all six DCFC sites.

A summary for each DCFC site on Hawai'i Island is provided below.

Hilo Office

This station is located at Hawaiian Electric's main Hawai'i Island office in Hilo. While no retail stores share the parking lot, there are some shops and eateries within a short walking distance. On Hawai'i Island, this location has the highest energy consumption but is second in the number of sessions.

In 2020, 74 percent of its charge sessions started during the Mid-Day, 11 percent of all sessions started during the Off-Peak, and 15 percent of all session started during the On-Peak.

Figure 27 below summarizes the key statistics collected for the Hilo Office site in 2020.

Hilo Office		2020
% utilization		
	Off-Peak	11%
	Mid-Day	74%
	On-Peak	15%
Energy (kWh) per session		
	Off-Peak	20
	Mid-Day	17
	On-Peak	21
Gross Revenue (\$) per session		
	Off-Peak	12.31
	Mid-Day	8.80
	On-Peak	13.34
Minutes (min) per session		
	Off-Peak	36
	Mid-Day	32
	On-Peak	36

Figure 27 Hilo Office site statistics for 2020.

Kona Office

This station is located at Hawaiian Electric’s office in Kailua-Kona. The area is near many commercial businesses with some markets and restaurants a few blocks away.

This station also has one of the highest Off-Peak utilizations on Hawai’i Island, which may be influenced by its location and use by commuters. In 2020, 64 percent of all sessions began during the Mid-Day, 18 percent of its charge sessions were initiated during the Off-Peak, and 18 percent of all sessions started during the On-Peak.

Figure 28 below summarizes the key statistics collected for Kona Office site in 2020.

Kona Office		2020
% utilization		
	Off-Peak	18%
	Mid-Day	64%
	On-Peak	18%
Energy (kWh) per session		
	Off-Peak	18
	Mid-Day	16
	On-Peak	13
Gross Revenue (\$) per session		
	Off-Peak	10.84
	Mid-Day	8.04
	On-Peak	8.19
Minutes (min) per session		
	Off-Peak	33
	Mid-Day	31
	On-Peak	27

Figure 28 Kona Office site statistics for 2020.

Waimea KTA

This charging station is located at a grocery store in Waimea in the northwest portion of Hawai'i Island, near other retail businesses.

In 2020, 58 percent of its charge sessions started during the Mid-Day, 17 percent of all sessions started during the Off-Peak, and 25 percent of all sessions started during the On-Peak.

Figure 29 below summarizes the key statistics collected for Waimea KTA site in 2020.

Waimea KTA		2020
% utilization		
Off-Peak		17%
Mid-Day		58%
On-Peak		25%
Energy (kWh) per session		
Off-Peak		22
Mid-Day		15
On-Peak		10
Gross Revenue (\$) per session		
Off-Peak		13.21
Mid-Day		7.79
On-Peak		6.16
Minutes (min) per session		
Off-Peak		39
Mid-Day		28
On-Peak		20

Figure 29 Waimea KTA site statistics for 2020.

The Shops at Mauna Lani

This station is located in a shopping area in a resort destination along the Kohala coast and continues to support EV drivers between Waimea and Kona with the Kona Airport in between.

In 2020, 74 percent of its charge sessions started during the Mid-Day, six percent of all sessions started during the Off-Peak, and 20 percent of all sessions started during the On-Peak.

Figure 30 below summarizes the key statistics collected for The Shops at Mauna Lani in 2020.

Mauna Lani		2020
% utilization		
Off-Peak		6%
Mid-Day		74%
On-Peak		20%
Energy (kWh) per session		
Off-Peak		18
Mid-Day		22
On-Peak		19
Gross Revenue (\$) per session		
Off-Peak		10.82
Mid-Day		11.44
On-Peak		12.27
Minutes (min) per session		
Off-Peak		36
Mid-Day		39
On-Peak		33

Figure 30 The Shops at Mauna Lani site statistics for 2020.

Punalu'u Bake Shop

The Punalu'u Bake Shop and Visitor Center DCFC in Na'ālehu opened to the public in March 2019. This location was chosen to alleviate range anxiety and support EV adoption. While traffic density is lower in the south side of Hawai'i Island, data indicates there are no public charging stations within ten miles of this location. A fast charging station in this area is important to provide residents and tourists the confidence to travel to destinations within and through the southern side of the island.

In 2020, 78 percent of its charge sessions started during the Mid-Day, 19 percent of all sessions started during the Off-Peak, and only three percent of all sessions started during the On-Peak.

Figure 31 below summarizes the key statistics collected for Punalu'u Bake Shop site in 2020.

Punalu'u Bake Shop		2020
% utilization		
	Off-Peak	19%
	Mid-Day	78%
	On-Peak	3%
Energy (kWh) per session		
	Off-Peak	16
	Mid-Day	16
	On-Peak	16
Gross Revenue (\$) per session		
	Off-Peak	9.84
	Mid-Day	8.26
	On-Peak	9.89
Minutes (min) per session		
	Off-Peak	43
	Mid-Day	31
	On-Peak	22

Figure 31 Punalu'u Bake Shop site statistics for 2020.

Puna Kai Shopping Center

A fast charging station was constructed at Puna Kai Shopping Center in Pahoia and opened to the public in August 2020. This location is expected to alleviate range anxiety and support EV adoption.

During the brief time this station was open during 2020, 65 percent of its charge sessions started during the Mid-Day, 18 percent of all sessions started during the Off-Peak, and 17 percent of all sessions started during the On-Peak.

Figure 32 below summarizes the key statistics collected for Puna Kai site in 2020.

Puna Kai		2020
% utilization		
	Off-Peak	18%
	Mid-Day	65%
	On-Peak	17%
Energy (kWh) per session		
	Off-Peak	13
	Mid-Day	13
	On-Peak	9
Gross Revenue (\$) per session		
	Off-Peak	8.18
	Mid-Day	6.62
	On-Peak	5.50
Minutes (min) per session		
	Off-Peak	43
	Mid-Day	43
	On-Peak	29

Figure 32 Puna Kai site statistics for 2020.

2021 site development

For 2021, residents are requesting an additional DCFC in Hilo or nearby since the next closest charger is at a higher elevation gain in Puna Kai. Hilo is still the main hub of residential and commercial activity with high concentrations of State and County offices located here. Additional sites are being considered throughout the service territory to complete the last four sites allowed in the EV-U pilot. In addition to providing further support of the EV charging network, the potential sites will also be supported by the Backbone Study showing additional need in that location.

Utilization in Maui County

After the EVohana program came to a close on July 31, 2020, Maui EV drivers went from having 15 DCFC sites to two, one at the Kahului Office under EV-U and one at the Haiku Marketplace under private ownership. As a result, utilization of the Kahului Office charger increased dramatically. While EV-MAUI chargers were installed, starting in August with the Pukalani Terrace Shopping Center (PTC), the other three chargers at Queen Ka’ahumanu Center (QKC), Lahaina Aquatic Center (LAC) and Pi’ilani Village Shopping Center (PVC) were not added until December. This meant that the Kahului Office charger was the only available DCFC in Central Maui and within a 20-mile radius.

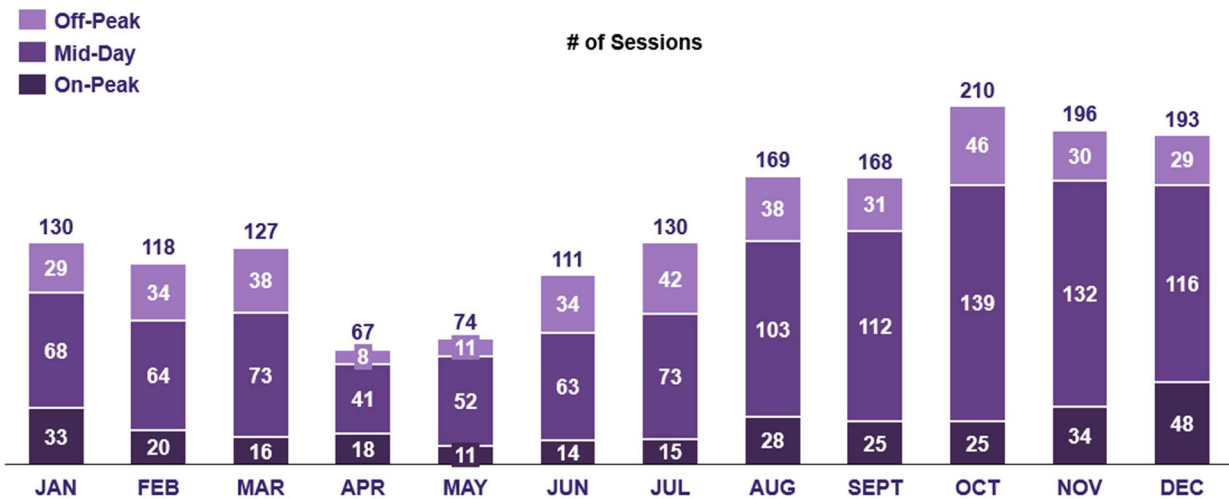


Figure 33 Monthly utilization in Maui County for 2020 for the two DCFC sites by TOU

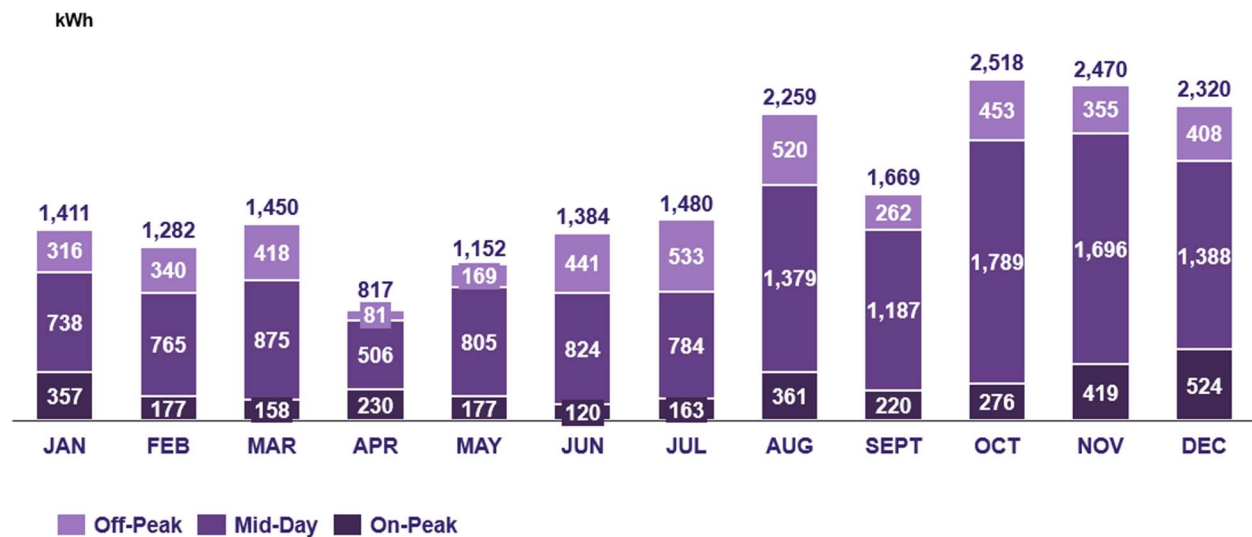


Figure 34 Monthly utilization by energy consumed (kWh) for Maui County for 2020 for two DCFC sites by TOU.

The overall utilization for locations in Maui County under Schedule EV-U is shown in Figure 35 below.

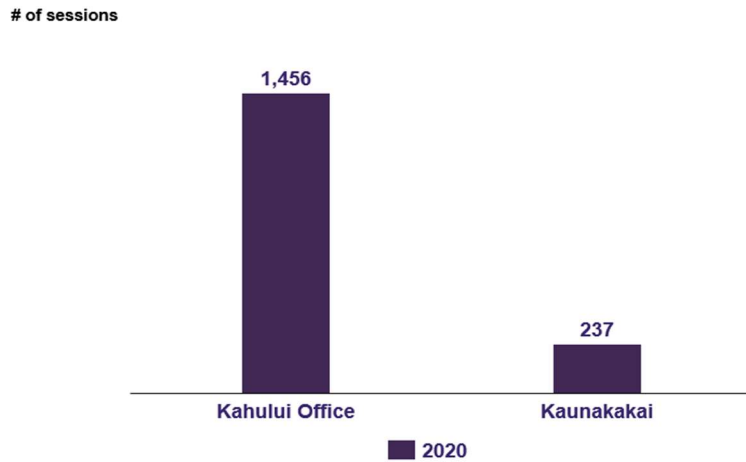


Figure 35 Annual utilization in Maui County for 2020 for two DCFC sites.

The overall energy consumption for EV-U in Maui County in 2020 is shown in Figure 36 below.

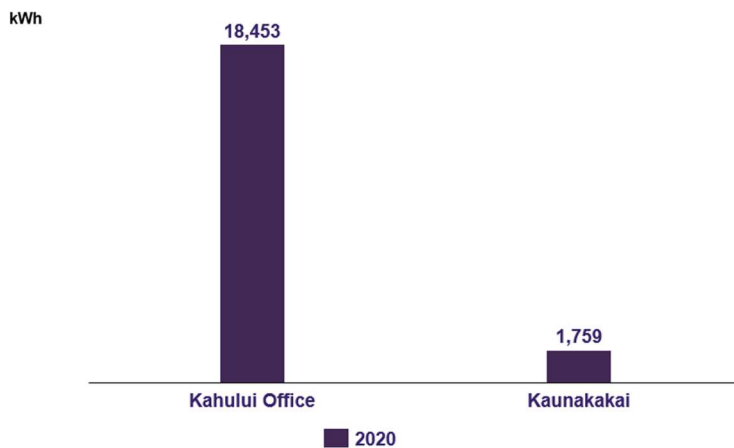


Figure 36 Annual energy consumption in Maui County for 2020 for two DCFC sites.

In 2020, the Company Schedule EV-U stations in Maui County accounted for five percent of all sessions in the pilot. This percentage is slightly higher than the four percent from 2019 most likely due to cancelation of the EVohana program on July 31, 2020. The EV-MAUI program is reported in a separate annual report.²² Maui County has 12 percent of all the EVs registered in the Company's territory.

²² Docket No. 2018-0422- For Approval to Establish EV-MAUI Electric Vehicle Fast Charging Service and Related Accounting Treatment Maui Electric's Revised Schedule EV-MAUI Tariff page 9, footnote 13. Transmittal No. 13-07-Schedule EV-F and EV-U Electric Vehicle Charging Services Pilots: Hawaiian Electric Companies' Annual Report filed no later than March 31 every year. The four sites selected to be part of the EVMAUI tariff will also comply with the same reporting requirements

Kahului Office

While this charging station is not co-located with retail businesses, shopping centers and restaurants are nearby.

In 2020, 59 percent of its charge sessions started during the Mid-Day, 23 percent of all sessions started during the Off-Peak, and 18 percent of all sessions started during the On-Peak.

Figure 37 below summarizes the key statistics collected for Kahului Office site in 2020.

Kahului Office		2020
% utilization		
	Off-Peak	23%
	Mid-Day	59%
	On-Peak	18%
Energy (kWh) per session		
	Off-Peak	12
	Mid-Day	13
	On-Peak	12
Gross Revenue (\$) per session		
	Off-Peak	7.11
	Mid-Day	6.53
	On-Peak	7.16
Minutes (min) per session		
	Off-Peak	24
	Mid-Day	28
	On-Peak	25

Figure 37 Kahului Office site statistics for 2020.

Kaunakakai

In 2018, Maui Electric installed a new fast charging station on Ala Malama Avenue in Kaunakakai fronting restaurants and retail shops. This charger remains the only public charging station on the island of Moloka'i and is centrally located to provide fast charging service to those driving to and from Kaunakakai, the main location of commerce on the island. Interestingly, while this charger is the only publicly available charger on Moloka'i, it has the lowest average kWh/session utilization. The most probable reason for this low utilization may be that the EV drivers on Moloka'i needing the charger are observed to be lower capacity and older model EVs. Also, most of the population on Moloka'i resides near to the charger keeping driving distances relatively short.

In 2020, almost 74 percent of its charge sessions started during the Mid-Day, 12 percent of all sessions started during the On-Peak, and almost 14 percent of sessions started during the Off-Peak.

Figure 38 below summarizes the key statistics collected for Kaunakakai in 2020.

Kaunakakai		2020
% utilization		
	Off-Peak	14%
	Mid-Day	74%
	On-Peak	12%
Energy (kWh) per session		
	Off-Peak	9
	Mid-Day	7
	On-Peak	7
Gross Revenue (\$) per session		
	Off-Peak	5.84
	Mid-Day	3.89
	On-Peak	4.46
Minutes (min) per session		
	Off-Peak	23
	Mid-Day	20
	On-Peak	16

Figure 38 Kaunakakai statistics for 2020.

2021 site development

The EV-MAUI Tariff was approved on January 10, 2020, which allows for the Company to install, own, operate and maintain additional DCFC outside of the EV-U pilot program. Under EV-MAUI, four sites were installed with DCFC stations having both CHAdeMO and CSS charging capability. While one site at the Pukalani Terrace Shopping Center was installed and open to the public in August, the other three sites were installed in late December and open to the public during the last week of the year. Therefore, 2021 will see the first charge sessions for the last three EV-MAUI chargers installed.

Additional sites are being considered throughout the service territory to complete the last four sites allowed in the EV-U pilot. In addition to providing further support of the EV charging network, the potential sites will also be supported by the Backbone Study showing additional need in that location.

Analysis of EV-U rate

Figure 39 below provides aggregate energy consumption by territory and TOU period. As shown below, the Mid-Day period continues to be the most utilized charging period that is in-line with the lowest charging rates for each island.

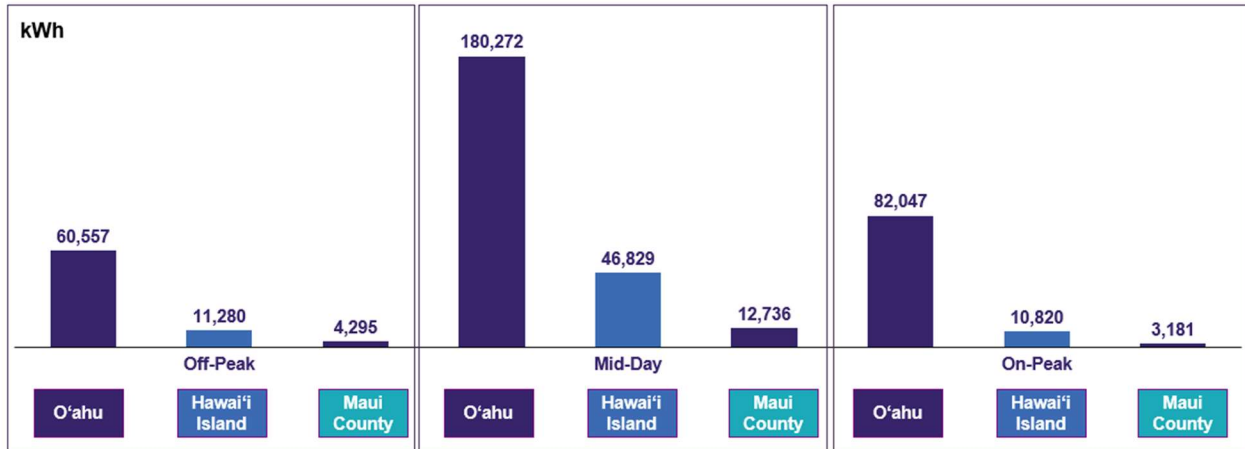


Figure 39 The energy consumed in aggregate increased overall from 2020. Off-Peak occurs from 10 PM-9 AM, Mid-Day occurs from 9 AM-5 PM, and On-Peak occurs from 5 PM-10 PM.

Figure 40 below shows the percentage of charging kWh consumption by island, again indicating that the Mid-Day time period is the most utilized by each utility, and in aggregate it represents 58% of all energy consumed at the EV-U chargers in 2020.

% of total energy (kWh) by time of day

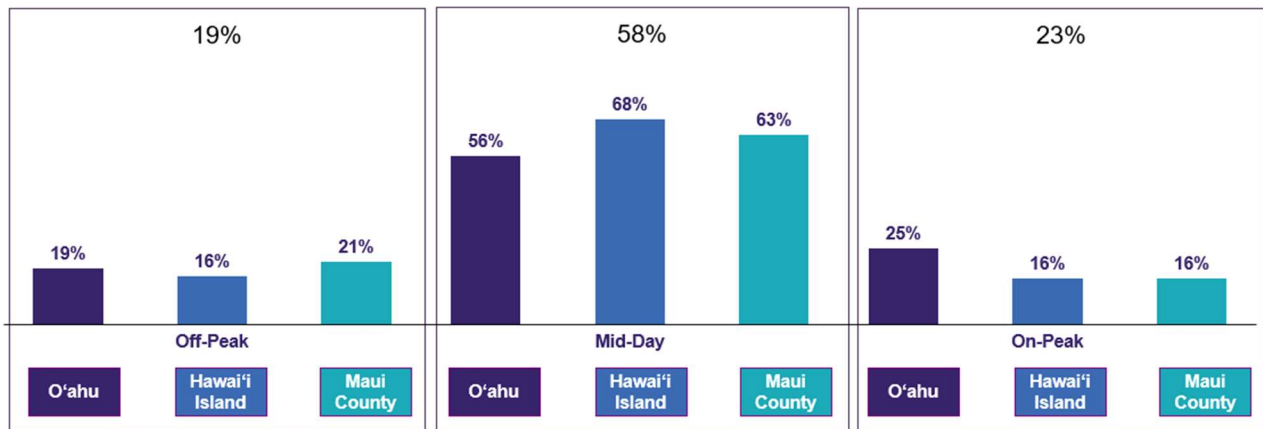


Figure 40 The percent of energy consumed by utility in all time periods for 2020. Off-Peak occurs from 10 PM-9 AM, Mid-Day occurs from 9 AM-5 PM, and On-Peak occurs from 5 PM-10 PM.

Figure 41 below provides the aggregate number of sessions (utilization data) by island and time-of-use period. The largest number of sessions for O’ahu, Hawai’i Island and Maui occurred during the Mid-Day period of 9 a.m. to 5 p.m.

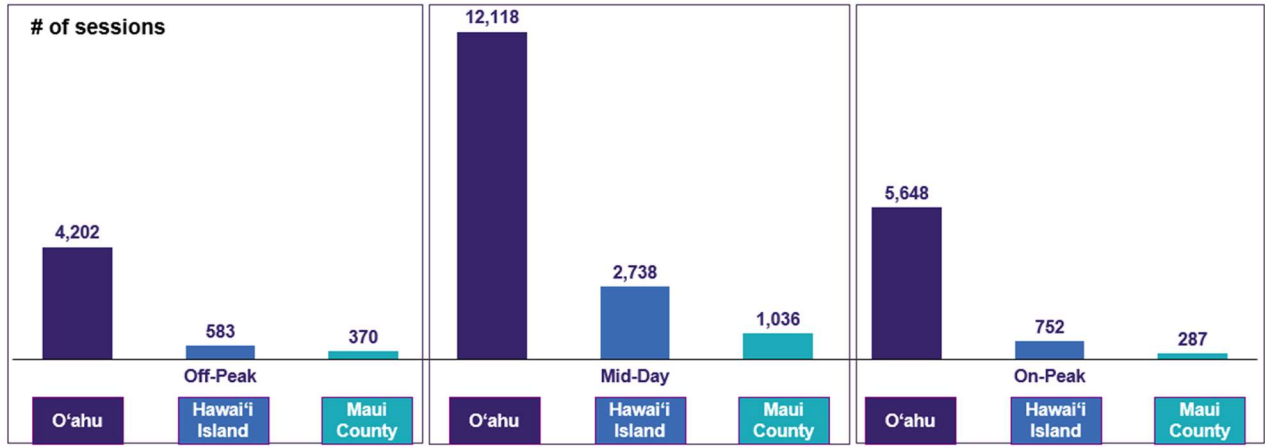


Figure 41 Utilization (number of sessions) increased in aggregate in all time periods for 2020. Off-Peak occurs from 10 PM-9 AM, Mid-Day occurs from 9 AM-5 PM, and On-Peak occurs from 5 PM-10 PM.

The percentage of sessions for each utility by time-of-use period for 2020 is shown in Figure 42 below. The Mid-Day time period is the most utilized by each utility and on aggregate is 58% of all charging sessions in 2020

% of sessions by time of day

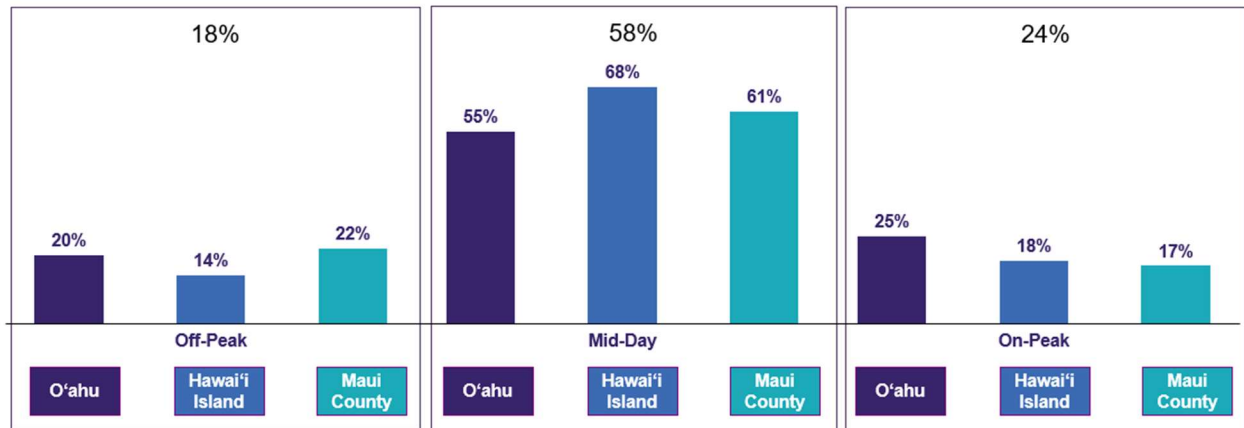


Figure 42 Utilization (number of sessions) by utility in all time periods for 2020. Off-Peak occurs from 10 PM-9 AM, Mid-Day occurs from 9 AM-5 PM, and On-Peak occurs from 5 PM-10 PM.

Figure 43 below shows the average time duration per session for all time periods for all EV-U chargers for 2020.

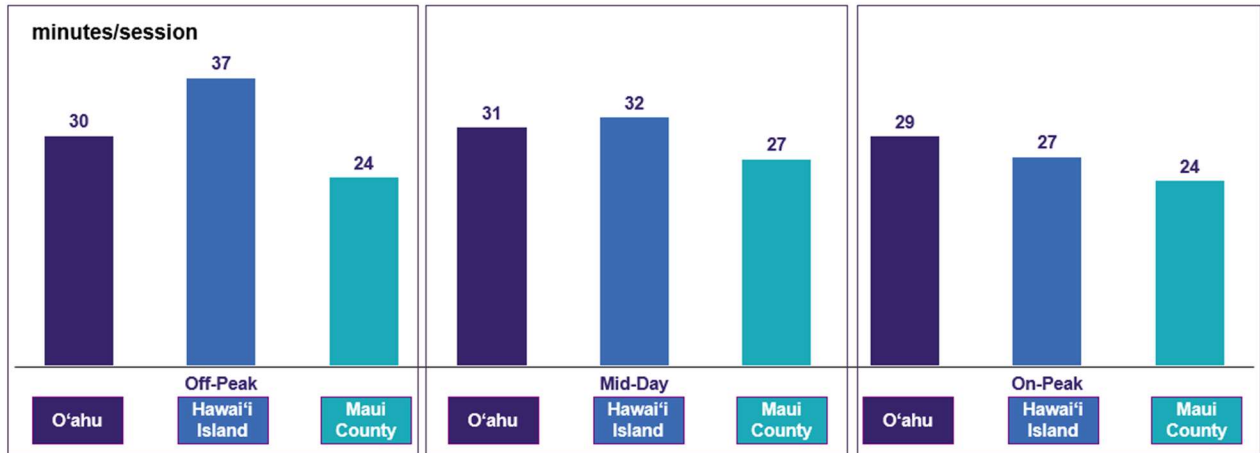


Figure 43 The time duration per session for 2020 for each time period. Off-Peak occurs from 10 PM-9 AM, Mid-Day occurs from 9 AM-5 PM, and On-Peak occurs from 5 PM-10 PM.

Figure 44 below illustrates the average energy consumption per session by time period.

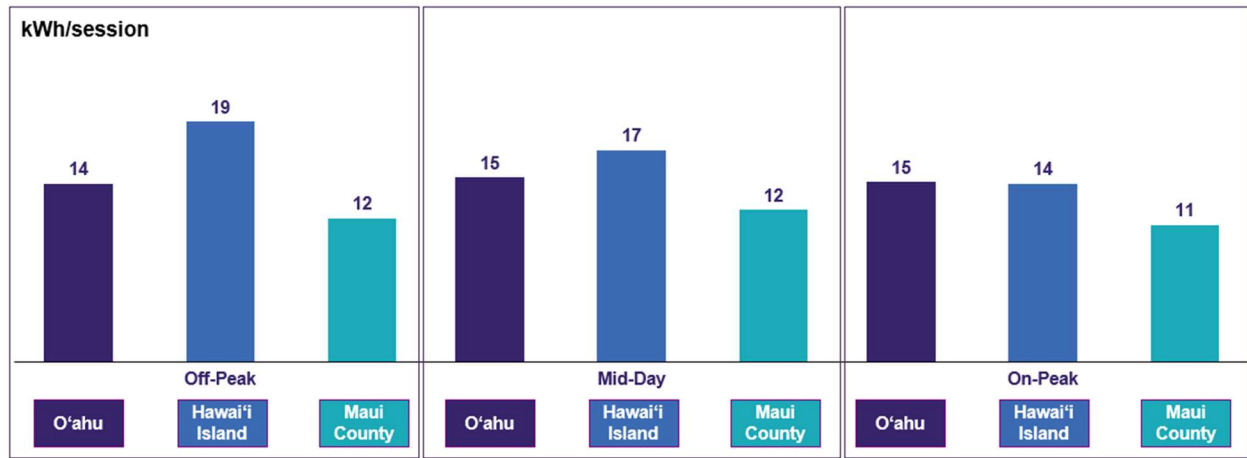


Figure 44 The energy consumed per session for all islands for 2020. Off-Peak occurs from 10 PM-9 AM, Mid-Day occurs from 9 AM-5 PM, and On-Peak occurs from 5 PM-10 PM.

Summary of Cost and Revenue²³

In D&O 34592, the Commission ordered the Company to provide “a discussion of how and to what extent the costs for each DCFC facility have been and/or are proposed to be recovered from ratepayers.”²⁴ The recovery of capital and O&M costs for Company-owned and operated DCFC stations are discussed herein.

Revenue and Operating and Maintenance (“O&M”) Expenses

In the early stages of the EV-U/EV-F pilot program development, there were stakeholder concerns regarding the Company’s influence on the EV charging market and competitive fairness. As a result, the Company took steps to be transparent when reporting operational costs by reflecting incurred costs in a similar fashion to a third-party charge station operator. Therefore, the cost of electricity associated with charge station use is included in reported O&M costs per site in this section of the Report. In October 2017, the Commission approved the proposed Schedule EV-U rate change “to provide greater alignment with charging session costs (moving Schedule EV-U rates from a fixed charging session rate to volumetric rate), system costs (incorporating certain program costs into Schedule EV-U rates), and system needs by adopting the Schedule TOU-RI time periods and structuring rates so that they are directionally consistent with the availability of photovoltaic generation and difference in generation costs.”²⁵ These new rates became effective December 12, 2017. Figure 45, Figure 47, and Figure 49 below summarize the revenue and O&M expense for each DCFC site in 2020 for O’ahu, Hawai’i Island, and Maui County, respectively. In this section of the report, site operating expenses include volumetric transactional fees and the underlying cost of electrical service, in a similar fashion to a third-party charge station operator. While the cost of electrical service is included as a cost of operation in this section, it is not included as a cost to the overall program or as part of the Company’s electrical sales, since the Company cannot report revenue of electric sales to itself. Therefore, a reverse energy charge is applied to the program costs reported in Appendix B.

Figure 45 illustrates the net values (revenue less expenses)²⁶ and site utilization ranking for 2020 for DCFC sites on O’ahu. The highest utilized charge station on O’ahu for 2020 is the Ward 2 DCFC; however, 801 Dillingham had the highest net positive revenue of \$1,755. In 2020, there was a net expense of \$82,486 in aggregate (inclusive of program expenses) for O’ahu (see Figure 46).

Figure 46, Figure 48, and Figure 50 summarize the revenue and the O&M expenses for all sites as well as the programmatic administrative expenses in 2020 for O’ahu, Hawai’i Island, and Maui County, respectively.

²³ Details of Revenues, Expenses, and Capital from inception of the program can be found in Appendix B.

²⁴ D&O 34592 at 68.

²⁵ Order No. 34867, filed October 13, 2017, at 11.

²⁶ A net positive effect occurs when revenues exceed O&M. A net negative effect occurs when revenues are less than O&M.

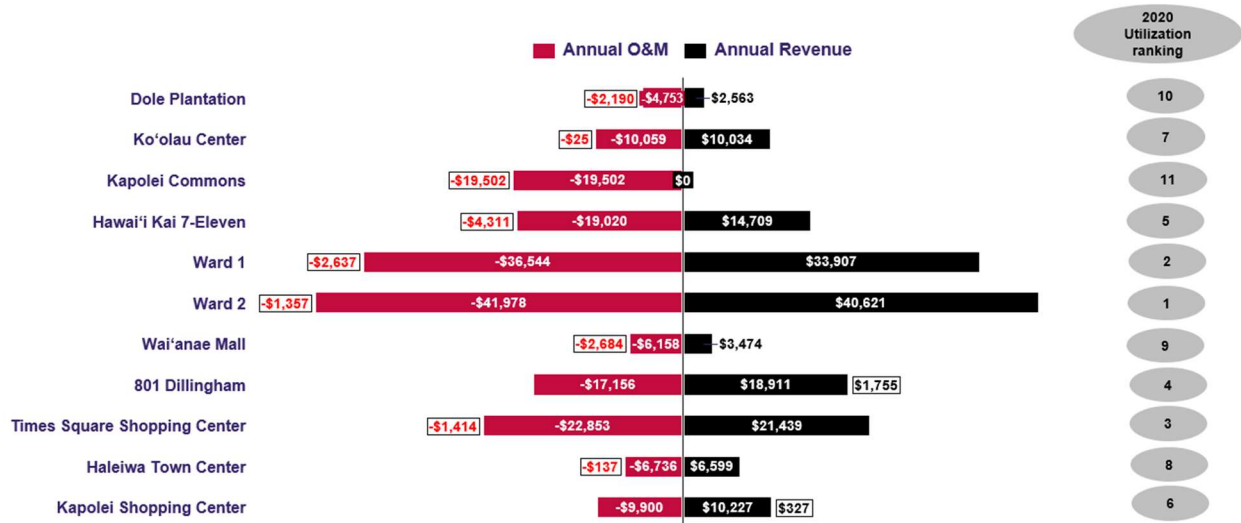


Figure 45 2020 annual revenue, O&M, net values, and utilization rank for O'ahu by site.

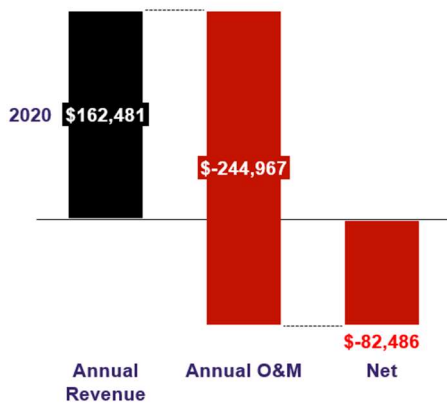


Figure 46 O'ahu aggregate annual revenue results (inclusive of program expenses) for 2020.

Figure 47 illustrates the net values (revenue less expenses) for 2020 for DCFC sites on Hawai'i Island. The highest utilized charge station on Hawai'i Island was the Hilo Office. In 2020, there was a net expense of \$9,433 (inclusive of program expenses) in aggregate for Hawai'i Island (see Figure 48).

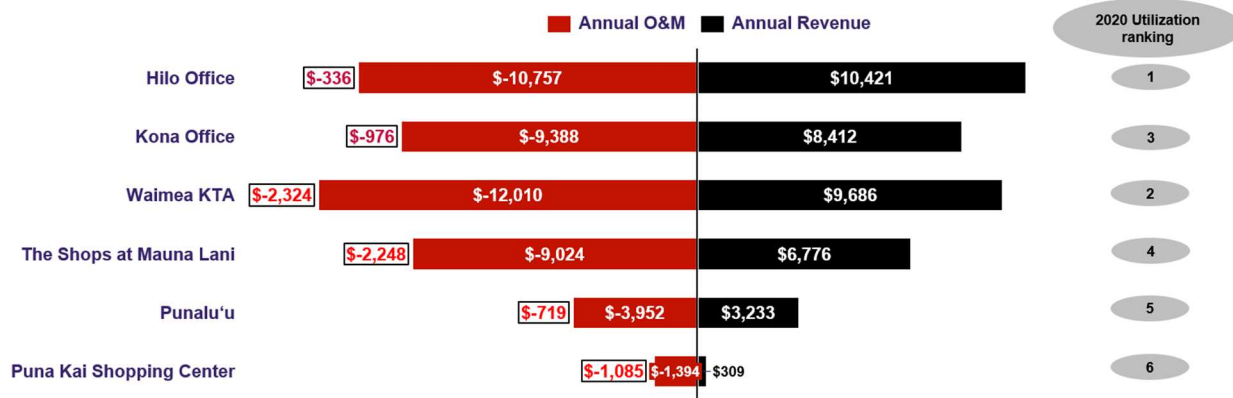


Figure 47 2020 annual revenue, O&M, net values, and utilization rank for Hawai'i Island.

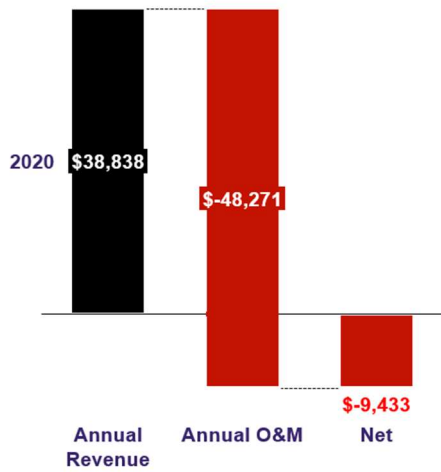


Figure 48 Hawai'i Island aggregate annual results (inclusive of program expenses) for 2020.

Figure 49 illustrates the net values (revenue less expenses) for 2020 for DCFC sites in Maui County. In 2020, there was a net expense of \$5,482 (inclusive of program expenses) in aggregate for Maui County (see Figure 485).



Figure 49 2020 annual revenue, O&M, and net values for Maui County.

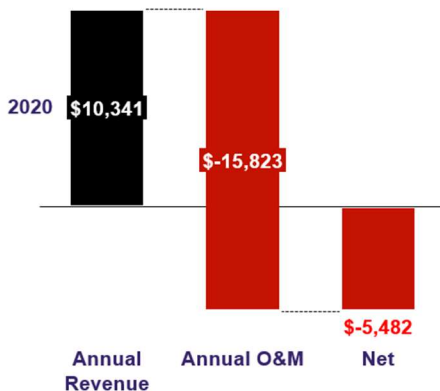


Figure 50 Maui County aggregate annual results (inclusive of program expenses) for 2020.

For further details regarding costs and revenues for 2020 and the program, see Appendix B.

Capital Costs

Figure 51 below provides the capital costs of each DCFC station as they were chronologically placed in operation. Average capital cost for the Company is \$167,377 per site. While the Company identifies locations at a site to minimize construction costs, the overall development costs largely vary based upon the site’s location, the availability of existing electrical infrastructure, condition of the existing parking space, and site host’s desired location on their property. Also, of note, construction costs generally tend to vary by island as well.

After approximately four years of operation, the original charge station at Kapolei Commons was no longer supported by the charger manufacturer and had been out of commission from the second half of

2019. The original equipment only supported the CHAdeMO DC fast charging standard. In late 2020, the original charger was replaced with a dual-standard DCFC and the cost of the new DCFC installation is added to the project capital cost which is now at \$ 321,590 (as shown in Figure 46). The updated project cost does not include the offset of a \$163,486 Contribution in Aid of Construction (“CIAC”) from Electric Research Power Institute (“EPRI”). If CIAC is subtracted from the Kapolei Commons original battery-tied experimental charge station, the net capital cost is \$158,104.

On Hawai’i Island, the Puna Kai DCFC was installed and made available to the public in August 2020. The Puna Kai location is key to the Hawaii Island EV drivers as it serves the large number of residents in Pahoia on the farthest eastern tip of the island and helps bridge the expansive gap between Hilo and Kona.

No additional EV-U sites were added in the Maui Electric service territory (Maui, Molokai and Lanai) in 2020. Four DCFC sites were installed on Maui under the EV-MAUI tariff and covered under the annual report for that program.

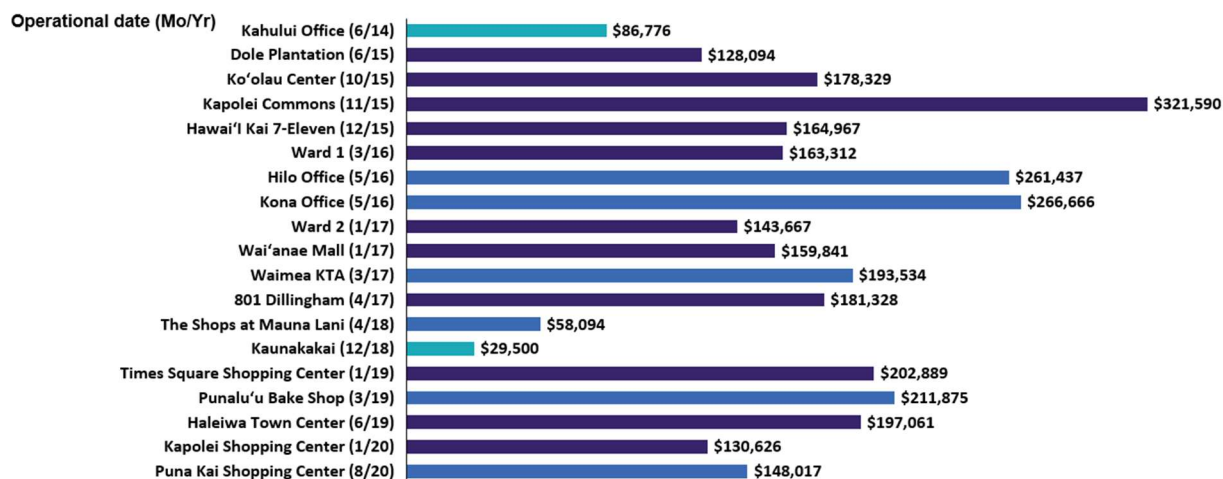


Figure 51 Capital cost associated with each DCFC in chronological order of operational date.

Subsidization by non-participating customers

As indicated herein, two of the charge stations on O’ahu showed net positive (revenues exceed expenses) results in 2020. Until utilization increased such that revenues exceed expenses, it is important to note that a key consideration in developing EV rates and programs is to reduce barriers to the adoption of EVs for customers. Because the EV market is still nascent in Hawai’i and EV proliferation is regarded as a State policy goal, it is prudent to provide a rate that will support the development of public EV charging infrastructure. The Company maintains that EV customers using charge stations in the EV-U pilot should not necessarily be characterized as benefitting from a subsidy in isolation, when that customer’s EV load is incremental discretionary load that needs to be served by the system in general. Therefore, Schedule EV-F and EV-U rates that support this incremental load should not entirely be characterized as being subsidized by other customers. Further, the revenues collected by the

incremental discretionary load of EV charging would not contribute to overall Company profits, but instead would constitute contributions to fixed costs and support the State’s transition to cleaner transportation. With continued EV growth, the long-term impact of aggregate growth of EVs in the State will also serve to eliminate any subsidization by non-EV drivers. As identified in the *Roadmap*, the Company anticipates that the electrification of transportation will provide long-term economic benefits for the Company’s customers, as increased energy demanded by EV drivers to charge their vehicles creates net benefits for all the Company’s customers – not just for EV drivers. This is because as EV drivers demand more energy, the utility’s fixed costs for generating and distributing energy are spread across more kWh units, thereby creating net benefits for all customers.

Figure 52 below summarizes the total annual revenue from Schedule EV-U compared to the potential revenue generated if the charging facility were billed under each Company’s respective Schedule J. This illustrates that the total EV-U revenues is approximately 86% percent of the potential Schedule J²⁷ revenues for 2020.

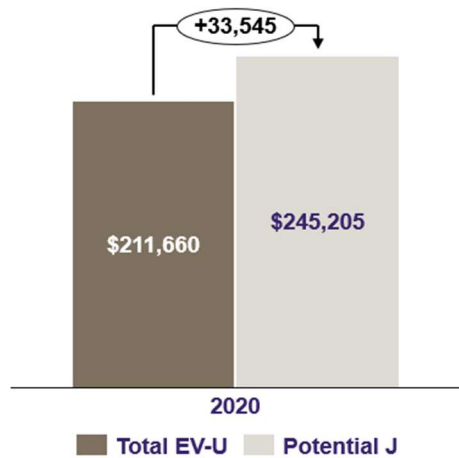


Figure 52 Comparison of the difference between potential schedule J and revenues from EV-U for 2020.

Recommendation of revisions to rate structures

In 2020, the Company filed for requests for an electric bus make-ready pilot and a commercial make-ready pilot. These make-ready pilots target high-capacity electric bus charging and Level 2 commercial charging. Also in 2020, the Company requested approval for new high-capacity EV charging rates, which provide a new rate structure to support expanded EV charging infrastructure deployment, including accommodating future business models wherein investments in future EV charging hubs that have higher charging capacity and utilization than currently exist in the State. The make-ready pilots will support the growth of charging infrastructure but will not nearly support the forecasted infrastructure needs outlined in the Company’s Backbone Study submittal. The Company, drawing on its experience in

²⁷ The potential Schedule J revenues were based upon the reported monthly kWh energy provided to charge EVs under Schedule EV-U and 47.5 kW billing demand.

the public charging pilot, intends to develop a programmatic expansion to the EV-U and EV-MAUI rates and charging programs in 2021. Additionally, the Company anticipates installing its 25th DCFC customer account in 2021, and afterwards will focus on adding additional DCFC stations at existing customer sites, to support growing needs while the Company develops its programmatic expansion.

Schedule EV-F Tariff

Adoption and Status of Schedule EV-F

Schedule EV-F was implemented to alleviate potential demand charges whereby “the absence of a demand charge and the inclusion of TOU rates serve to encourage the development of public EV charging facilities by keeping electricity costs low for new, start-up public EV charging facilities.”²⁸ Globally, public EV charging facilities continue to show increasing signs of technological maturity. Companies such as Electrify America are installing DCFC facilities with “charging speeds of up to 150kW” and are now locating “charging power levels up to 350kW”²⁹ in North America. However, profit margins are still relatively slim due to the higher installation, equipment, and maintenance costs.

The difficult business prospects discussed above have limited the development of non-utility fast charging facilities in the State, with the notable exception of the JUMPSmart Maui program (branded as the “EVohana” Program as of September 1, 2017), which was funded by the New Energy and Industrial Technology Development Organization (“NEDO”) of Japan.³⁰ The chargers in the EVohana program were operated and maintained by the Hitachi Advanced Clean Energy Corporation (“HIACE”) under an agreement with the Maui Economic Development Board (“MEDB”). Unfortunately, on March 31, 2019, the agreement with HIACE ended and MEDB reduced the EVohana DCFC network on Maui down to eight sites from the original 13. At the request of a community partnership made up of Ulupono Initiative, the County of Maui, MEDB, and Blue Planet Foundation, Maui Electric filed a request to take over the sites and install new DCFCs. The Commission issued Decision and Order No. 36943 on January 10, 2020 in Docket No. 2018-0422 approving the Revised Schedule EV-MAUI Tariff consistent with D&O 36229 for four selected EVohana network sites.³¹ On July 31, 2020, MEDB ceased the EVohana program and canceled their remaining five EV-F metered service accounts. This leaves only one EV-F metered account on Maui at the Haiku Marketplace owned and operated by Greenlots.

²⁸ Transmittal No. 12-05 at 23.

²⁹ <https://www.electrifyamerica.com/our-plan>

³⁰ The EVohana Program was administered by the Maui Economic Development Board (“MEDB”), which served as the largest public charging network on Maui. The EVohana Program supported approximately 300 of the 1,000 EV owners on the island. Under this program, MEDB owned charging stations at 13 of the 15 DCFC sites on Maui. The remaining two sites are owned individually by Maui Electric and Greenlots. The EVohana DCFC network on Maui was operated and maintained by Hitachi Advanced Clean Energy Corporation (“HIACE”) under an agreement between MEDB and HIACE that expired on March 31, 2019 and was not extended. Upon discontinuation of HIACE’s service, MEDB had limited options to continue offering EV charging service on Maui—resulting in permanent dissolution of the program on Maui, leaving many EV drivers without sufficient public charging resources. As the EV community relied on the EVohana charge stations to meet their transportation needs, removing the charge stations without replacement stations would’ve undermined EV adoption efforts and caused existing EV owners on Maui uncertainty with their existing EV investments.

³¹ The charging stations selected are located at Queen Kaahumanu Center, Piilani Village Shopping Center, Pukalani Terrace Center, and Lahaina Aquatic Center.

On Hawai'i Island, one new EV-F account was added at the same shopping center as the Puna Kai DCFC for an additional Level 2 charger owned and operated by the site host. This shopping center was opened in late 2020.

On O'ahu, no customers were added to Schedule EV-F in 2020. However, the Company continues to receive multiple inquiries from organizations interested in installing charging infrastructure in the State. These organizations have stated an interest in rate designs that can help alleviate demand charges for a period of time in order to facilitate the investment in infrastructure, especially high capacity charging that may be greater than 100 kW service. Figure 53 below illustrates the adoption of the EV-F rate from inception through 2020. Further details of the 2020 statistics for EV-F adoption are provided in Appendix C.

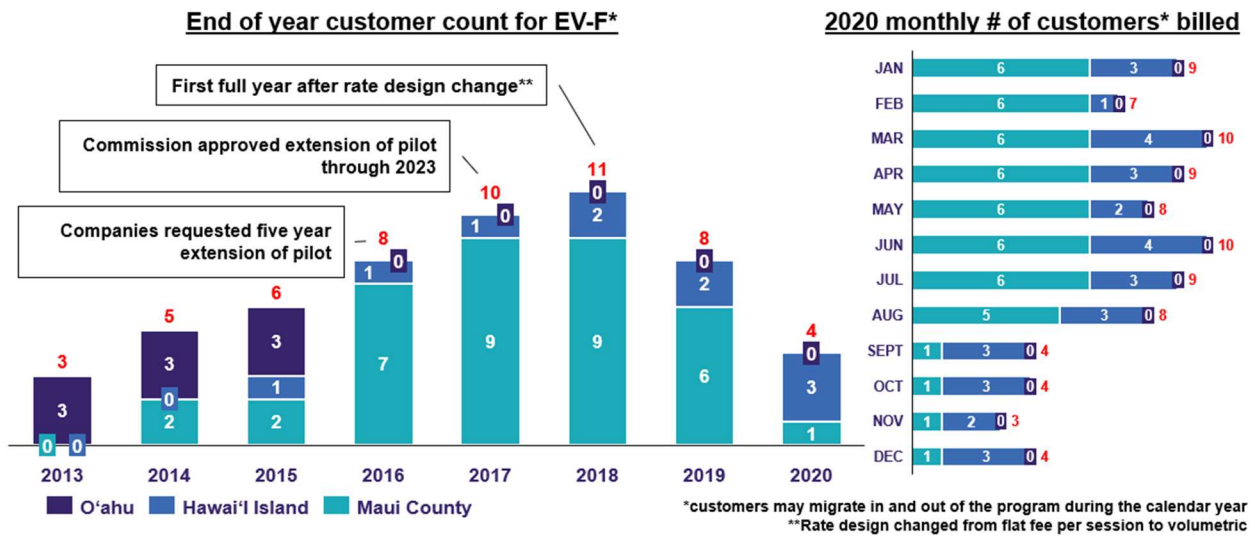


Figure 53 Adoption of EV-F pilot from inception of the program (2013) through 2020.

Summary of Cost and Revenue

In Figure 54 below, the revenue generated each month from Schedule EV-F for Hawaiian Electric’s three operating utilities is illustrated. In 2020, \$2,644 in revenue was generated from customers under the Schedule EV-F program. O’ahu has no customers on Schedule EV-F. Incremental costs to support the Schedule EV-F program, including the cost to enroll and bill customers, are minimal.



Figure 54 Revenues collected from EV-F customers in 2020.

Subsidization by non-participating customers

Schedule EV-F is a rate intended to reduce significant demand charges that could result from increased energy consumption through EV charger installation and use. A report prepared by Idaho National Laboratory (“INL”), stating that “[d]emand charges associated with 50 to 60-kW high power charging . . . can have a significant impact on a business’ monthly electric utility bill.”³² The Company maintains that Schedule EV-F can help to reduce initial cost barriers for prospective third-party infrastructure providers and incentivize greater investment in infrastructure.

Figure 55 below summarizes the total annual revenue from Schedule EV-F compared to the potential revenue generated if the charging facility were billed under each utility’s respective Schedule J.³³ The potential revenue under Schedule J³⁴ for the year 2020 was \$41,227 higher than revenues from Schedule EV-F.

Schedule EV-F is a TOU rate with the lowest rate during the Mid-Day to incentivize charging during the peak solar generation hours of 9 a.m. to 5 p.m. As this Mid-Day utilization increases in comparison to the On-Peak and Off-Peak hours, the difference between total Schedule EV-F revenue and the potential

³² Idaho National Laboratory, “What is the Impact of Utility Demand Charges on a DCFC Host?” June 2015. Available at <http://avt.inl.gov/pdf/EVProj/EffectOfDemandChargesOnDCFCHosts.pdf>.

³³ General Service Demand rate applicable to general light and/or power loads that exceed 5,000 kWh per month or exceed 25 kW three times within a twelve-month period but are less than 300 kW per month and supplied through a single meter.

³⁴ The 2019 potential Schedule J revenue provided in Figure 55 is calculated using the maximum monthly billing demand recorded based on new meters that were installed that measure demand. Previous meters did not measure demand. The potential Schedule J revenue provided in 2018 used as assumed monthly billing demand of 47.5 kW. A typical EV will fast charge at power up to 50 kW but will reduce power as the battery state of charge increases.

Schedule EV-U rate will increase. In 2020, 33 percent of all energy provided by Schedule EV-F was consumed during the Mid-Day, 21 percent On-Peak and 46 percent Off-Peak

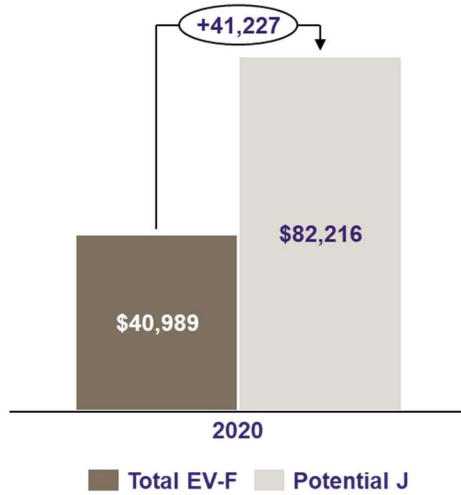


Figure 55 Difference between the total EV revenue collected and potential revenues under Schedule J for 2020.

Recommendation of revisions to rate structures

Schedule EV-F allows relief of demand charges for commercial customers providing public charging facilities for electric service up to 100kW. Adoption of rate Schedule EV-F remains low as investment of DC fast charging infrastructure in Hawaii remains low. Public fast charging installations outside of Hawaii are including high-capacity charging stations above 100kW as well as multiple charge stations installed at charging hubs. State and Counties have policies and procurement plans to convert their fleets to electric. Electric conversion of private fleets will increase the electrical demand at charging locations and are not eligible for enrollment under Schedule EV-F. In 2020, the Company filed a request for time-of-use commercial rate Schedule EV-J and EV-P, which provides lower price for energy during the Mid-Day and demand charges lower than existing commercial electric rates. This filing also requests to allow the Company to close Schedule EV-F to new enrollment on O’ahu, Hawaii Island and Maui if the Commission approves the new proposed EV-J and EV-P rate schedules.³⁵

³⁵ The Company’s pending request regarding EV-F does not seek closure of EV-F for customers on the islands of Moloka’i and Lanai.

Customer engagement and outreach (Roadmap Initiative #1)

As part of the Company's Roadmap, Initiative #1, customer engagement and outreach, is foundational and paramount to the success of the electrification of transportation in Hawai'i. The Company discovered that there is limited awareness, understanding, and enthusiasm for EVs among fleet operators, auto dealerships, and the public.³⁶ By working with partners³⁷ who share clean transportation objectives and who are willing to contribute their knowledge and expertise, the Company has leveraged the unique abilities of each partner and is hopeful that partners will continue to contribute financial and/or in-kind resources to this effort. Ultimately, the extent of the Company's action needed on outreach and education will depend on the ability of partners to assist.

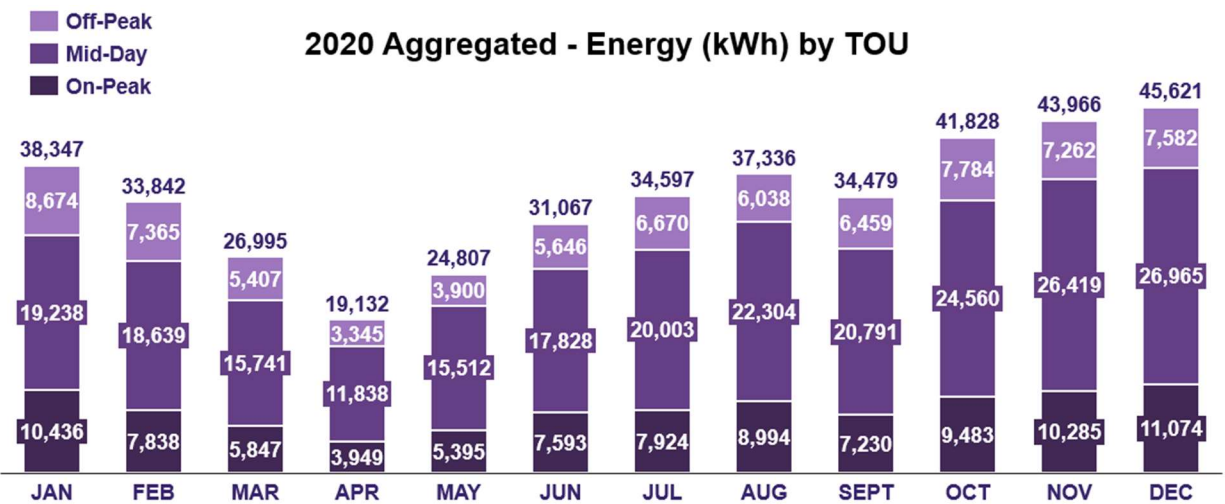
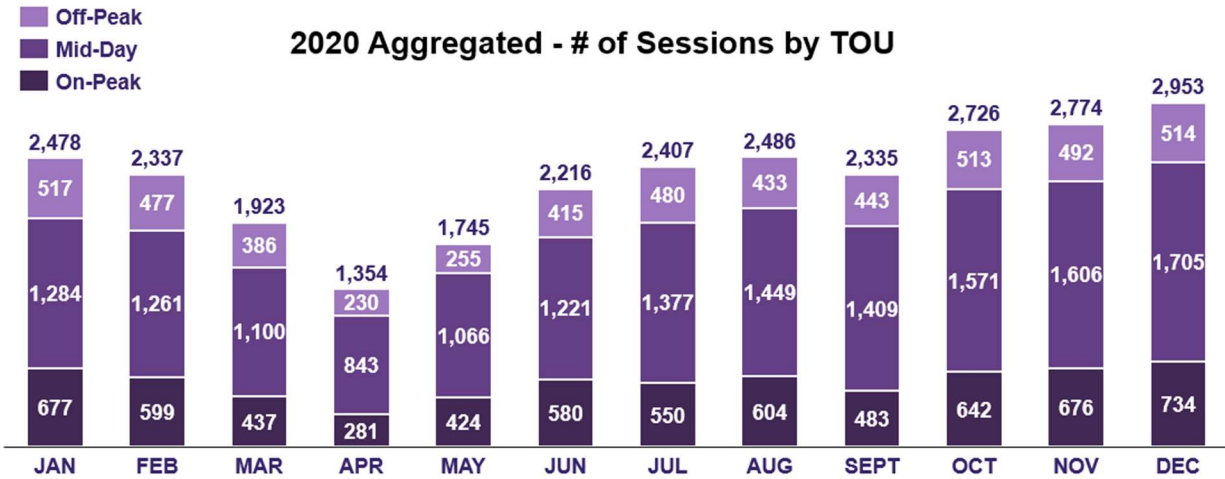
In 2020, the Company has contributed to the EV-U and EV-F program education and outreach effort in the following ways:

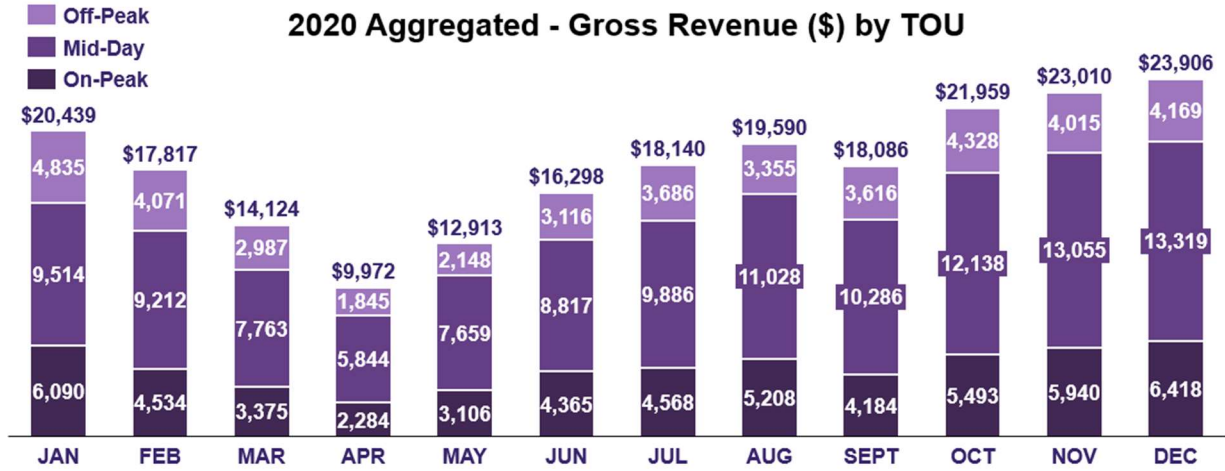
- Ongoing - Keeping the Company's website up to date as a go-to resource for many customers seeking information about the Company's DCFC charge stations, including location, operation status (i.e., in-service or out-of-service), and applicable rates;
- June 10, 2020 - Company-hosted virtual meeting to educate stakeholders on Electric Bus Make Ready Infrastructure Pilot
- July 29, 2020 - Company-hosted virtual meeting to educate stakeholders on Charging Initiatives and the Backbone Study
- October 21, 2020 - Company-hosted virtual meeting to educate stakeholders on Charge Ready Hawaii Pilot
- November 2020 - Trained Hawaiian Electric Call Center to field customers questions regarding EVs, EV charging, and Hawaiian Electric's EV programs and initiatives, resulting in quicker response times.
- Press and social media alerts announcing the opening of new DCFC stations;
- University of Hawaii-Maui College Nissan LEAF donations to support EV training and repair programs;
- Conducted discussions with individual condo association and management on EVSE, existing TOU rates, EV incentives, and charger installation options; and
- Engaged community partners (Ulupono Initiative, County of Maui, Maui Economic Development Board, and Blue Planet) and the public on the EV-MAUI Tariff approval to take over four select EVohana sites.

³⁶ Docket No. 2018-0135, Electrification of Transportation Strategic Roadmap filed March 29, 2018 at 69.

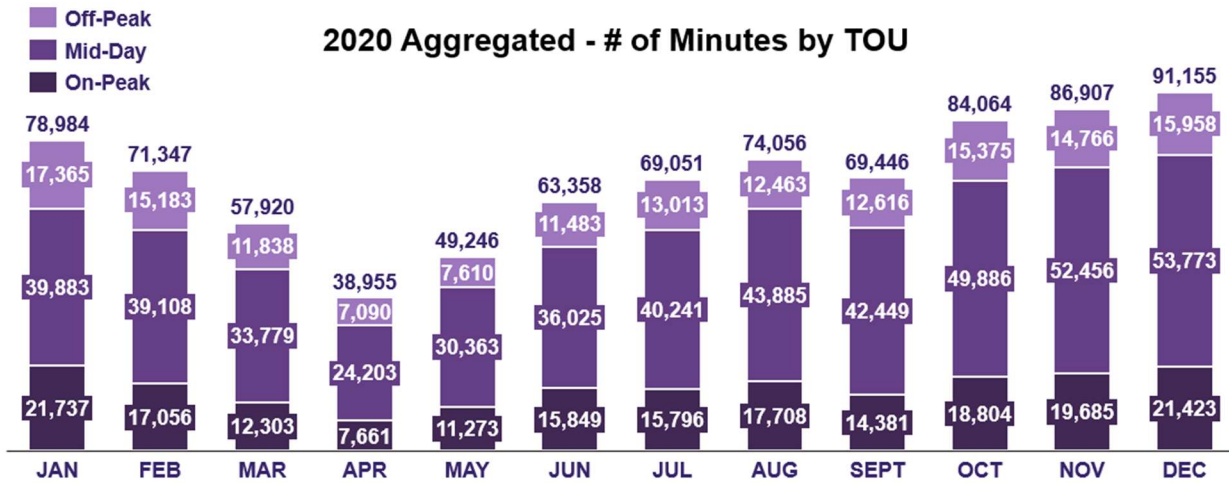
³⁷ Potential partners identified in the Roadmap: Drive Electric Hawai'i, Hawai'i Energy, NGOs, Automakers, Electrify America, and Dealerships and Hawai'i Automotive Dealer Association.

Appendix A – Summaries of All EV-U Charging Locations by TOU period





Note: The aggregated gross revenue (\$) by TOU shown above is extracted from the network provider and does not represent booked annual revenue for the program.



Appendix B – Details for Schedule EV-U for 2020

Details of Revenues, Expenses, and Capital for EV-U for 2020 and from inception of pilot program.

2020 Actuals:	Program Costs, January - December 2020			
	O'ahu	Hawai'i	Maui County	Totals
Revenue	\$ (162,481)	\$ (38,838)	\$ (10,341)	\$ (211,660)
Expenses				
Energy charge	\$ 126,570	\$ 31,694	\$ 11,428	\$ 169,692
Reverse energy charge	\$ (126,570)	\$ (31,694)	\$ (11,428)	\$ (169,692)
O&M				
Labor	\$ 15,346	\$ 732	\$ 1,217	\$ 17,295
Non-labor	\$ 103,051	\$ 15,845	\$ 3,178	\$ 122,074
Total Expenses	\$ 118,397	\$ 16,577	\$ 4,395	\$ 139,369
Capital costs, net of CIAC	\$ 386,221	\$ 47,438 *	\$ -	\$ 433,659
2020 PTD:	Program Costs, Pilot Inception Through December 2020			
	O'ahu	Hawai'i	Maui County	Totals
Revenue	\$ (510,033)	\$ (104,041)	\$ (16,681)	\$ (630,755)
Expenses				
Energy charge	\$ 384,433	\$ 91,580	\$ 29,890	\$ 505,902
Reverse energy charge	\$ (384,433)	\$ (91,580)	\$ (29,890)	\$ (505,903)
O&M				
Labor	\$ 739,131	\$ 7,098	\$ 44,602	\$ 790,830
Non-labor	\$ 261,596	\$ 38,019	\$ 50,752	\$ 350,367
Total Expenses	\$ 1,000,726	\$ 45,117	\$ 95,353	\$ 1,141,197
Capital costs, net of CIAC	\$ 2,142,430	\$ 1,139,622	\$ 116,276	\$ 3,398,327

2020 Monthly Utilization and Recorded Revenues

O'ahu	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Transaction Volumes (sessions)	1,915	1,854	1,581	1,102	1,454	1,785	1,947	1,941	1,812	2,085	2,176	2,316
Total Revenues	\$14,653	\$14,641	\$13,956	\$11,498	\$8,010	\$10,340	\$12,884	\$14,438	\$14,806	\$13,375	\$16,516	\$17,365
Hawai'i Island	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Transaction Volumes (sessions)	433	365	215	185	217	320	330	376	355	431	402	444
Total Revenues	\$4,588	\$4,554	\$3,166	\$1,870	\$1,516	\$1,966	\$2,668	\$2,890	\$3,668	\$3,736	\$4,109	\$4,109
Maui County	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Transaction Volumes (sessions)	130	118	127	67	74	111	130	169	168	210	196	193
Total Revenues	\$722	\$778	\$693	\$782	\$444	\$607	\$746	\$813	\$1,218	\$884	\$1,326	\$1,326

Appendix C – Details of Schedule EV-F for 2020

