JUL 29 2019

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ANTHONY KOYAMATSU
Director
Environmental Division

Hawaiian Electric
Campbell Industrial Park

July 26, 2019

CERTIFIED MAIL NO. 7016 2710 0000 8739 2030
RETURN RECEIPT REQUESTED

Ms. Marianne Rossio, P.E.
Manager, Clean Air Branch
State of Hawaii Department of Health
2827 Waimano Home Road
Hale Ola Building, Room 130
Pearl City, Hawaii 96782

Dear Ms. Rossio:

Subject: **Updated Greenhouse Gas Emissions Reduction Plan**
Second Revision to Significant Modification Applications
Covered Source Permit Nos. 0548-01-C, 0240-01-C, 0238-01-C, 0239-01-C, 0234-01-C, 0007-01-C, 0235-01-C, 0232-01-C, 0067-01-C, and 0031-04-C
Attachment II-GHG
Hawaiian Electric Company, Inc.
Hawai'i Electric Light Company, Inc.
Maui Electric Company, Ltd.

Hawaiian Electric Company, Inc. (Hawaiian Electric), Hawai'i Electric Light Company, Inc. (Hawai'i Electric Light), and Maui Electric Company, Ltd. (Maui Electric), collectively referred to as "Companies", hereby submits an updated Greenhouse Gas Emissions Reduction Plan (GHG ERP) and the second revision to the significant modification applications dated March 28, 2018. These revisions reflect responses received from Department of Heath to comments the Companies submitted on May 15, 2019 concerning the proposed CSPs.

The Companies request that DOH modify the partnership aggregate and Hawai'i Island site-specific emissions caps for calendar year 2019, as detailed in Attachment II – GHG, Special Condition C.1.b of the CIP CSP (Permit No. 0548-01-C), and cross-referenced in each of the GHG CSPs, to reflect the loss of renewable energy from Puna Geothermal Venture (PGV), which had previously been included in the calculations in the Companies' GHG ERP.

Table 1 attached shows the proposed cap adjustment as presented in Table A-2 of the enclosed GHG ERP. The derivation of the cap addition is explained in the enclosed GHG ERP Attachment F.

Revisions were also made to item I.E of Form S-6 for all the GHG ERP partnering facilities to update the reference to the corresponding GHG ERP. Enclosed is Form S-6 for each above reference facilities which are direct replacements for the Form S-6 in the applications previously submitted to the Department of Health. No other changes are proposed with this submittal.

If you have any questions regarding this submittal, please contact Myrna Tandi at 543-4535 or myrna.tandi@hawaiianelectric.com.

Sincerely,

Attachment: (1) Table 1: Proposed 2019 GHG Limits for PGV Outage

Enclosures: (1) Updated Greenhouse Gas Emissions Reduction Plan dated July 26, 2019
(2) Revised Form S-6 for Kahe, Waiau, Honolulu, CIP, Kahului, Maalaea, Palaau, Kanoelehua-Hill, Keahole, and Puna Generating Stations

Ec (w/Encl.): Michael Madsen, Department of Health, michael.madsen@doh.hawaii.gov

Cc (w/Encl.): **RETURN RECEIPT REQUESTED**
Mr. Gerardo Rios [Certified Mail No.7016 2710 0000 8739 2047]
Chief, Permits Office, Air Division
U.S. EPA Region 9
75 Hawthorne Street
Mail Code: AIR-3
San Francisco, CA 94105

Table 1
Proposed 2019 GHG Limits for PGV Outage

Company	Covered Source	PGV 100% Operation CO2e Emissions Limit (tpy)	Calendar Year 2019 GHG Limits GHG Limit Adjustment (tpy)	Calendar Year 2019 GHG Limits CO_2e Emissions Limit (tpy)
HE	Kahe	2,133,752	0	2,133,752
	Waiau	808,286	0	808,286
	Honolulu	0	0	0
	CIPGS	53,740	0	53,740
HE Subtotal		2,995,778	0	2,995,778
ME	Kahului	154,633	0	154,633
	Maalaea	459,864	0	459,864
	Palaau	26,454	0	26,454
ME Subtotal		640,951	0	640,951
HE	Kanoelehua-Hill	172,456	17,132	189,588
	Keahole	242,208	31,213	273,421
	Puna	31,747	39,535	71,282
	Shipman	0	0	0
HL Subtotal		446,411	87,880	534,291
Hawaiian Electric Companies		**4,083,140**	**87,880**	**4,171,020**
AES Hawai'i		**1,691,605**	**0**	**1,691,605**
Hamakua Energy Power		**153,699**	**97,524**	**251,223**
Kalaeloa Partners, LP		**1,094,813**	**0**	**1,094,813**
Partnership Total		**7,023,257**	**185,404**	**7,208,661**

JUL 29 2019

Hawaiian Electric
Maui Electric
Hawai'i Electric Light

Certification

This certification applies to the July 26, 2019 update of the **Greenhouse Gas Emissions Reduction Plan for the Hawaiian Electric Companies** *that is being submitted to the Department of Health in accordance with HAR 11-60.1 Subchapter 11.*

I certify that I have knowledge of the facts set forth therein, that the same are true, accurate, and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Department of Health as public record.

Name: Robert C. Isler
Title: Vice President, Power Supply, Hawaiian Electric Company

Signature: _____ Date: 7/24/19

Hawaiian Electric
Maui Electric
Hawai'i Electric Light

Greenhouse Gas Emissions Reduction Plan for the Hawaiian Electric Companies

Submitted to Hawai'i Department of Health in accordance with HAR 11-60.1 Subchapter 11

July 26, 2019 Update

Table of Contents

Record of Revisions

Revision No.	Date	Revisions
0	06/30/2015	Original submission to DOH
1	09/08/2017	Designate Campbell Industrial Park Generating Station (CIPGS) CSP No. 0548-01-C as the Main Permit for Partnership; update facility-specific GHG caps in Table A-1 based on latest forecasts; miscellaneous text updates.
2	02/28/2018	Add AES Hawai'i, Kalaeloa Partners LP (KPLP), and Hamakua Energy Power (HEP) as partners; revise GHG Partnership section; add Monitoring explanation.
3	10/15/2018	Change KPLP baseline and cap in Table A-1 to Tier 3 basis per agreement with DOH. Updates to Table 1 and text to address DOH comments rec'd 9/21/2018.
4	05/15/2019	Changes for consistency with CSP comments. Adjust 2019 Hawai'i Electric Light, HEP, and aggregate GHG caps for loss of PGV. Table A-2 added.
5	07/26/2019	Adjust 2019 Hawai'i Electric Light, HEP, and aggregate GHG caps for loss of PGV in accordance with response to comments received from DOH. Attachment F added.

Introduction

Hawaiian Electric Company, Inc. (Hawaiian Electric) and its subsidiaries, Hawai'i Electric Light Company, Inc. (Hawai'i Electric Light) and Maui Electric Company, Ltd. (Maui Electric), (collectively, "Hawaiian Electric Companies" or "Companies") support Hawai'i's goal established in Act 234 of lowering GHG emissions in the state to 1990 levels.

In accordance with Hawai'i Administrative Rules (HAR) under §11-60.1 Subchapter 11, which were adopted to implement Act 234, facilities that have the potential to emit more than 100,000 tons per year of CO_2e (carbon dioxide equivalent) emissions are designated as "Affected Sources." Affected Sources are required to reduce their GHG emissions at least 16% from their 2010 baseline levels by 2020 and thereafter unless the owner or operator can substantiate that a 16% reduction is unattainable and Hawai'i Department of Health (DOH) approves a lesser reduction.[1] The Act 234 regulations also allow Affected Sources to partner with one another to combine their facility-wide GHG emissions caps to leverage emission reductions among partnering facilities to meet the combined GHG emissions caps.[2]

The Hawaiian Electric Companies operated eleven generating facilities in 2010 that each had the potential to emit more than 100,000 tons per year of CO2e and, thus, qualify as Affected Sources. Act 234 regulations require an Affected Source to prepare a GHG Emissions Reduction Plan (ERP) that is used by DOH to set the Affected Source's CO_2e emissions cap. The ERP also demonstrates how that cap will be met by 2020. The Hawaiian Electric Companies have prepared this ERP to satisfy that requirement.

The Hawaiian Electric Companies acquire power from Independent Power Producers (IPPs) and from renewable energy sources (e.g., rooftop solar panels, wind farms, utility scale solar installations) that are used to meet customer demand. In the event an IPP has unplanned outages or there is reduced energy output from renewable sources (e.g., due to cloudy or rainy weather, lack of wind, etc.), the Hawaiian Electric Companies must make up for the shortfall by increasing generation from other generating sources. Historically, the shortfall has been made up by the Companies' Affected Sources, thereby increasing their GHG emissions. In the future, the commissioning of new, rapid-response generators such as the Schofield Generating Station in 2018 as well as battery energy storage systems (BESS) charged by renewable energy sources will allow shifting some of that load to facilities that have lower GHG emissions.

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[1] HAR 11-60.1-204(c)

[2] HAR 11-60.1-204(d)(6)(A)

GHG Reduction Partnership

This section explains the partnership approach used by the Hawaiian Electric Companies and its Partners in preparing their GHG ERPs.

The power generation facilities operating on each of Hawai'i's islands are highly interdependent. If one or more of them cannot produce their scheduled power output, the other facilities on the island must generate more power than planned to make up for the shortfall. A scheduled or unscheduled outage that takes a major generating unit offline for an extended period can significantly shift GHG emissions from one facility to another. Assigning firm GHG emissions caps to individual facilities does not provide sufficient flexibility to accommodate those types of system upsets that are a natural part of system operation.

For these reasons, the Hawaiian Electric Companies and three major Independent Power Producers (IPPs) have elected to use the partnering provisions in Act 234 Regulations[3] to create a Partnership involving all eleven of the Hawaiian Electric Companies' Affected Sources, the Hamakua Energy Power (HEP) facility, the AES Hawai'i facility, and the Kalaeloa Partners LP (KPLP) facility (collectively "Partnership Facilities" or "Partnership"). The Partnership has an overall GHG emissions cap that it commits to attain. Individual partnering facilities have site-specific GHG emissions reduction goals that are used to apportion penalties that may be assessed in the event the overall GHG emissions cap is exceeded. The DOH will include the site-specific goals as GHG emissions caps, along with implementing conditions, in each site's Covered Source Permit (CSP). Owing to the operating flexibility that partnering in this manner affords, the Partnership Facilities can commit to an aggregate 16% reduction of GHG emissions from their respective baselines for their facilities. The site-specific and overall GHG emissions reduction targets for the Partnership Facilities are listed in Tables A-1 and A-2 of Attachment A. The two tables present alternative operating scenarios with and without Puna Geothermal Venture (PGV) operating, as explained further in the next section. The Power Supply Improvement Plan (PSIP) for the Hawaiian Electric Companies that was approved by the Hawai'i Public Utilities Commission (PUC) on July 14, 2017[4] is the blueprint for how that reduction will be accomplished.

The Hawaiian Electric Companies, HEP, AES Hawai'i, and KPLP are submitting separate ERPs for their facilities. The ERPs share the same GHG emissions reduction goals provided in Table A-1 and A-2, but the individual plans explain the GHG baselines, monitoring, and other plan requirements specific to each partner.

[3] HAR 11-60.1-204(d)(6)(A).

[4] *Hawaiian Electric Companies' PSIP Update Report,* PUC Docket 2014-0183. December 23, 2016.

2019 GHG Cap Adjustments for PGV Outage

PGV was forced to stop generating energy in early 2018 by volcanic activity, removing a substantial amount of renewable energy from the system and significantly increasing GHG emissions from the Hawai'i Electric Light and HEP units that have to offset that lost capacity. In 2017 PGV accounted for 33% of total energy generation on Hawai'i Island and is the largest single renewable energy generator in the State. PGV plans to return to operation but the timing is uncertain because of the significant infrastructure damage that occurred. PGV is not expected to return to operation until at least 2020. Loss of PGV qualifies as a reason for DOH to revise the GHG cap under HAR §11-60.1-204(4): "Renewable energy producers cease operations or fail to meet contractual obligations with the affected source, and there are no reasonable alternatives." There are no renewable alternatives to make up for 38 Megawatts (MW) of firm PGV capacity.

PGV's energy generation is equivalent to 185,404 tons of GHG emissions from the Hawai'i Electric Light and HEP fossil fuel units that must operate more to replace it, as detailed in Attachment F. That was calculated by comparing actual emissions in 2017, the last full year PGV operated, with the 12 months from July 2018 to June 2019 when PGV was offline. Table A-2 in Attachment A assigns those emissions to other generating units in proportion to their July 2018 to June 2019 operation. The Hawaiian Electric Companies propose that the caps in Table A-2 only apply for calendar year 2019 while more renewable energy is integrated into the system. For all succeeding years the caps in Table A-1 will apply.

It should be noted that the Companies have experienced delays beyond their direct control involving several new renewable energy projects anticipated in the PSIP that were counted on to lower GHG emissions. The Companies are not seeking an adjustment for these delays, but they have the effect of increasing GHG emissions more than 100,000 tons above what was expected in the earlier ERPs submitted to DOH.

Even with this cap adjustment the Partnering Facilities commit to doing what they can to hold emissions below the Table A-1 limits in 2019. That may include altering unit dispatch priorities to reduce GHG emissions to the extent practicable although large reductions cannot be expected by that means. Since changing dispatch order may be contrary to minimizing customer costs, some level of PUC approval may be required.

Emission Reduction Plan Required Elements

Hawai'i Administrative Rule (HAR) §11-60.1-204(d) states the GHG Emissions Reduction Plan required of Affected Sources shall at a minimum include the following elements:

(1) ***Facility-wide Baseline Annual Emission Rate (tpy CO_2e).*** *Calendar year 2010 annual emissions shall be used as the baseline emissions to calculate the required facility-wide GHG emissions cap, unless another baseline year or period is approved by the director. Baseline emissions shall be determined in accordance with section 11-60.1-115, separated between biogenic and non-biogenic emissions, and exclude all emissions of noncompliance with an applicable requirement or permit limit. The owner or operator shall include the data and calculations used to determine the baseline emissions. If calendar year 2010 is deemed unrepresentative of normal operations, then the owner or operator may propose an alternate baseline annual emission rate....*[5]

Attachment A, Table A-1 lists the baseline GHG emissions for the Partnership Facilities. The Hawaiian Electric Companies' facilities all use 2010 calendar year emissions as their baselines. GHG emissions were calculated using the procedures specified in EPA's Mandatory GHG Reporting Rule (40 CFR Part 98, Subpart C). The Kahe, Waiau, and Honolulu facilities used Tier 3 level calculations specified in §98.33 and the other facilities used Tier 2 level calculations. All baselines shown in Table A-1 for the Hawaiian Electric Companies' facilities are as reported via EPA's e-GGRT system for 2010 except for Campbell Industrial Park Generating Station (CIPGS) and Shipman. For calendar year 2010 CIPGS and Shipman GHG emissions were lower than the 25,000 metric ton reporting threshold under Part 98 so GHG emissions reporting was not required.

(2) ***2020 Facility-wide GHG Emissions Caps.*** *Determine the facility-wide GHG emissions cap in accordance with subsection (c), using calendar year 2010 or the proposed GHG baseline emission rate determined by paragraph (1) above. If the required emissions cap requiring a sixteen percent (16%) emission reduction from baseline year emissions is deemed unattainable, the owner or operator shall provide [a justification and proposal for an alternative cap]....*

In determining whether or not the required GHG emissions cap is attainable, the owner or operator of an affected source shall first conduct the GHG control assessment described in paragraphs (3) to (5). Available EPA

[5] HAR 60.1-204(d)(1)

guidelines for GHG Best Available Control Technology analysis and GHG control measures by source type shall be used as applicable for this assessment.[6]

Attachment A, Tables A-1 and A-2 list the overall and facility-specific GHG emissions caps the Partnership Facilities commit to achieving by 2020 to comply with the Rule with all their Affected Sources grouped into one Partnership. The overall GHG emissions cap in Table A-1 reflects a 16% reduction in GHG from their GHG emissions baselines.

Table A-1 shows that the overall GHG emissions reduction target for the Hawaiian Electric Companies is 24.4%, which exceeds the overall 16% GHG emissions reduction for the Partnering Facilities because IPPs will continue to be preferentially dispatched for contractual reasons and because they are the lowest-cost power producers. Most of the generation displaced by renewable energy will come from reduced operation of Hawaiian Electric's Affected Sources.

One of the important benefits of the Partnership for customers is that it allows the GHG emissions reduction goal of Act 234 to be met while maintaining the lowest energy cost to customers.

Monitoring and Reporting to Demonstrate GHG Emissions Reductions

The Hawaiian Electric Companies' facilities will use the same procedures used to establish their GHG baseline emissions, as described in paragraph (1), to calculate their annual GHG emissions and demonstrate the Partnership's compliance with the GHG emissions reduction requirement. GHG emissions for each facility will be reported annually on EPA's e-GGRT system and semi-annually to the DOH.

The Hawaiian Electric Companies' facilities use the GHG emissions calculation procedures specified in 40 CFR Part 98, Subpart C. They are not required to use Continuous Emissions Monitoring Systems (CEMS) for GHG emissions monitoring and do not have all the necessary instrumentation to be able to do so.

(3) ***Available Control Measures.*** *Identify all available control measures with potential application for each source type, and all on-the-book control measures the facility is committed or will be required to implement affecting GHG emissions. At a minimum, the following shall be considered as applicable:*

(A) Available technologies for direct GHG capture and control;

(B) Fuel switching or co-fired fuels;

(C) Energy efficiency upgrades;

[6] HAR 60.1-204(d)(2)

(D) Combustion or operational improvements;

(E) Restrictive operations;

(F) Planned upgrades, overhaul, or retirement of equipment;

(G) Outstanding regulatory mandates, emission standards, and binding agreements; and

(H) Other GHG reduction initiatives that may affect the facility's GHG emissions. Unless the owner or operator of the source has direct ownership or legal control over a GHG reduction initiative, that initiative cannot be relied upon as a proposed control strategy. Identification of GHG reduction initiatives, whether or not the owner or operator has ownership or legal control, will serve to highlight their potential importance for reducing GHG emissions in the state. The owner or operator of an affected source will only benefit from a GHG initiative if the initiative reduces or helps to reduce and maintain the source's GHG emissions below its permitted facility-wide GHG emissions cap.[7]

Table 1 lists the potential GHG emissions control options cited above and their feasibility for the Hawaiian Electric Companies. ERP Attachments referenced in Table 1 further describe the GHG emissions control options and discuss their feasibility and costs.

[7] HAR 11-60.1-204(d)(3)

TABLE 1 - EVALUATION OF GHG EMISSIONS CONTROL OPTIONS

	GHG Control Option	Feasibility and Benefit
(A)	Carbon Capture and Storage (CCS)	Not Economically Viable - See Attachment B for details.
(B)	Fuel switching or co-firing fuels (Natural Gas)	Not Feasible – The Hawaiian Electric Companies explored importing liquefied natural gas. However, the PUC rejected that option as part of its decision to deny the merger of the Hawaiian Electric Companies with NextEra. See Attachment C for details about the potential GHG emissions benefits.
(C)	Fuel switching or co-firing fuels (Biofuels)	Not Feasible to do on a large scale – The Hawaiian Electric Companies are currently permitted and are burning limited quantities of biodiesel. Attachment D contains a discussion of the availability and cost of biodiesel.
(D)	Energy efficiency upgrades and combustion improvements	Attachment E summarizes the Hawaiian Electric Companies' evaluation of energy efficiency improvements available to their power generating units. No economically viable improvements were identified that would contribute significantly towards reducing GHG emissions.
(E)	Restrictive operations	If one of the generating facilities in the Hawaiian Electric Companies' electrical grids restricts operation to limit its GHG emissions, other facilities must operate more to meet customer demand so the result is that emissions are redistributed rather than reduced or eliminated. The Partnership concept provides flexibility for lower GHG emitting facilities to operate more to lower overall GHG emissions and Hawaiian Electric intends to do this as much as possible within system and economic constraints. However, the GHG emissions reductions available through this route are limited because the more efficient units (e.g., combined cycle combustion turbines) already operate preferentially because they tend to be lower cost generators.

(F)	Planned upgrades, overhaul, or retirement of equipment	As new renewable energy projects come online, the operation of existing fossil-fueled units can be reduced or ceased. The Hawaiian Electric Companies have deactivated or retired the following fossil-fuel units since the 2010 baseline year: • Shipman S3 and S4. Permanently decommissioned and CSP closed December 31, 2015. • Honolulu H8 and H9. Deactivated January 2014.
(G)	Outstanding regulatory mandates, emission standards, and binding agreements	Hawai'i set a 100 percent Renewable Portfolio Standard (RPS) for electrical generation by 2045. The Hawaiian Electric Companies' December 2016 Power Supply Improvement Plan (PSIP) describes how the Companies intend to accomplish that goal. EPA proposed the Affordable Clean Energy (ACE) Rule on August 31, 2018. It is not clear yet whether it will apply to the Hawaiian Electric Companies' oil-fired generating units. The emphasis of ACE Rule is to improve the efficiency of existing generators through measures to be adopted by the states.
(H)	Other GHG emissions reduction initiatives: Renewable Energy (RE) Projects: Wind, Solar, and Battery Energy Storage Systems (BESS) Deployment of new flexible, rapid response generation to enable more integration of renewable energy sources.	The Hawaiian Electric Companies' main strategy for lowering GHG emissions is to continue replacing fossil-fueled generation with utility-scale and distributed (e.g., rooftop solar) renewable energy sources. The December 2016 PSIP includes additional utility scale RE coming online between 2017 and 2019: Hawaiian Electric - 206.2 MW of new utility scale RE + 70MW BESS Maui Electric - 8.74 MW of new RE + 9MW BESS Hawai'i Electric Light - 3 MW of new RE. The December 2016 PSIP also describes new firm generation projects that provide the rapid response capability needed to work with the varying output from renewables. One of these is the Schofield Generating Station that came online in 2018.

(4) ***Technically Feasible Measures.*** *For any new control measure identified for the facility, eliminate all technically infeasible options based on physical, chemical, or engineering principles that would preclude the successful operation of the control with the applicable emission unit or source. Document the basis of elimination, and generate the list of technically feasible control options for further evaluation. All committed and required on-the-book measures shall remain on the list.*[8]

As noted above, Table 1 lists the potential GHG emissions control options and their feasibility. Attachments referenced in Table 1 further describe the GHG emissions control options and discuss their feasibility and costs.

(5) ***Control Effectiveness and Cost Evaluation.*** *List the technically feasible control options and identify the following for each control measure as applicable. All cost data shall be provided in present dollars.*

(A) Control effectiveness (percent pollutant removed);

(B) Expected emission rate (tons per year CO_2e, pounds CO_2e/kilowatt-hour);

(C) Expected emission reduction (tons per year CO_2e);

(D) Energy impacts (BTU, kilowatt-hour);

(E) Environmental impacts (other media and the emissions of other regulated air pollutants);

(F) Any secondary emissions or impacts resulting from the production or acquisition of the control measure; and

(G) Economic impact (cost effectiveness: annualized control cost, dollar/megawatt-hr, dollar/ton CO_2e removed, and incremental cost effectiveness between the control and status quo).

For committed or required on-the-books control measures and any other GHG control initiatives, identify at a minimum, items (A) through (C) above. Considering the energy, environmental, and economic impact, determine the GHG control or suite of controls found to be feasible in achieving the maximum degree of GHG reductions for the facility. Determine whether the required GHG emissions cap, pursuant to subsection (c) will be met. If an alternate cap must be proposed for approval, declare the proposed percentage GHG reduction and the alternate GHG reduction cap. Provide the justification and associated support information (e.g., references,

[8] HAR 11-60.1-204(d)(4)

assumptions, vendor quotes, sample calculations, etc.) to substantiate the control analysis and alternate GHG emissions cap.[9]

As noted above, Table 1 lists the potential GHG emissions control options and their feasibility. Attachments referenced in Table 1 further describe the GHG emissions control options and discuss their feasibility and costs.

(6) ***Proposed Control Strategy.*** *Present the listing of control measures to be used for implementation in meeting the required or proposed alternate 2020 facility-wide GHG emissions cap. Include discussion of the control effectiveness, control implementation schedule, and the overall expected GHG CO_2e emission reductions (tpy) for the entire facility. Owners or operators shall also consider the following:*

(A) Affected sources may propose to combine their facility-wide GHG emissions caps to leverage emission reductions among partnering facilities in meeting the combined GHG emissions caps. If approved by the director, each partnering facility will be responsible for complying with its own adjusted GHG facility-wide emissions cap.

(B) Except for fee assessments and determining applicability to this section, biogenic CO_2 emissions will not be included when determining compliance with the facility-wide emissions cap until further guidance can be provided by EPA, or the director, through rulemaking.

(C) *The approved facility-wide GHG emissions cap and the associated monitoring, recordkeeping, and reporting provisions will be made a part of the covered source permit, enforceable by the director.*[10]

The Hawaiian Electric Companies will collectively reduce their GHG emissions 16% from the 2010 baseline year, generally in accordance with the power generation forecasts described in their PSIP that was submitted in December 2016 and accepted by the PUC on July 14, 2017.[11] Although the PSIPs are not enforceable under Chapter 342B, HRS, Air Pollution Control, they do carry the weight of oversight by the PUC and public expectations.

The Hawaiian Electric Companies' GHG emissions reductions will result directly from increased state-wide reliance on renewable energy sources as detailed in the PSIP. The Hawaiian Electric Companies have consistently met, and exceeded, the Renewable Portfolio Standards (RPS) agreed to as part of the Hawai'i Clean Energy Initiative (HCEI). For instance, in 2015 23.2% of the Companies' overall power

[9] HAR 11-60.1-204(d)(5)

[10] HAR 11-60.1-204(d)(6)

[11] Public Utilities Commission of the State of Hawai'i Decision and Order No. 34696. July 14, 2017.

generation was from renewable sources,[12] well ahead of the RPS goal of 15% by 2015.[13] In 2017, 26.8% of the Companies' power generation was from renewable sources. The RPS goals have increased due to House Bill 623, signed into law by Governor David Ige on June 5, 2015, which establishes a new RPS goal of 100% renewables by 2045. In 2017, the GHG emissions from the combined Hawaiian Electric Companies were 20.0% lower than the 2010 baseline year. Continued progress towards the RPS and PSIP goals will assist GHG emissions from power generation to decline further.

As explained in Table 1 and the supporting attachments, the Hawaiian Electric Companies' evaluation of potential GHG emissions control measures identified no additional measures that are technically feasible and cost effective. Accordingly, the Companies do not propose to implement any GHG emissions controls.

As described earlier, the Hawaiian Electric Companies' eleven affected facilities are partnering with three IPPs to meet the GHG emissions reduction target. Table A-1 lists the overall GHG annual emissions limit for the Partnership Facilities along with site-specific GHG emissions limits for each of the Partnering Facilities.

The Hawaiian Electric Companies have designated Campbell Industrial Park Generating Station (CIPGS) as the Main Permit for their affected facilities. The CIPGS CSP will list the Total Partnership GHG emissions cap and the site-specific emissions caps for the Hawaiian Electric Companies' other facilities. The CSPs for the Hawaiian Electric Companies' other facilities will reference the CIPGS CSP for GHG emissions limits.

[12] *2017-2018 Corporate Sustainability Report*. Hawaiian Electric Companies. Page 4.

[13] HRS §269-92(2). It should be noted that the RPS allows affiliated electrical utilities to aggregate their renewable portfolios. HRS §269-93. Accordingly, all GHG emissions reductions referenced in this section represent the aggregate renewable portfolios for Hawaiian Electric, Hawai'i Electric Light, and Maui Electric.

Table A-1: ERP Partnership Baseline CO_2e Emissions and Proposed CSP Limits (1)

Company	Covered Source	Baseline CO2e Emissions (metric tpy)	Baseline CO2e Emissions (tpy)	CSP Limits CO2e Reduction (%)	CSP Limits CO2e Reduction (tpy)	CSP Limits CO2e Limit (tpy)
Hawaiian Electric (HE)	Kahe	2,518,411	2,776,073	23.1%	642,321	2,133,752
	Waiau	974,642	1,074,359	24.8%	266,074	808,286
	Honolulu	121,208	133,609	100.0%	133,609	0
	CIPGS	13,559	14,946	-259.6%	-38,794	53,740
HESubtotal		3,627,821	3,998,988	25.1%	1,003,210	2,995,778
Maui Electric (ME)	Kahului	209,414	230,839	33.0%	76,206	154,633
	Maalaea	562,012	619,512	25.8%	159,649	459,864
	Palaau	25,615	28,236	6.3%	1,782	26,454
ME Subtotal		797,041	878,587	27.0%	237,636	640,951
Hawai'i Electric Light (HEL)	Kanoelehua-Hill	202,106	222,784	22.6%	50,328	172,456
	Keahole	173,623	191,387	-26.6%	-50,821	242,208
	Puna	90,438	99,691	68.2%	67,944	31,747
	Shipman	9,246	10,192	100.0%	10,192	0
HEL Subtotal		475,413	524,053	14.8%	77,642	446,411
Hawaiian Electric Companies		**4,900,275**	**5,401,629**	**24.4%**	**1,318,488**	**4,083,141**
AES Hawai'i		**1,525,526**	**1,681,605**	**-0.6%**	**-10,000**	**1,691,605**
Hamakua Energy Power		**165,992**	**182,975**	**16.0%**	**29,276**	**153,699**
Kalaeloa Partners, LP		**993,198**	**1,094,813**	**0.0%**	**0**	**1,094,813**
Partnership Total		**7,584,991**	**8,361,022**	**16.00%**	**1,337,764**	**7,023,258**

Notes:

(1) Table A-2 applies for calendar year 2019 only due to loss of PGV renewable energy.

(2) Selections of facility emissions baselines are described in the individual GHG Emission Reduction Plans for the Hawaiian Electric Companies, AES Hawai'i, Kalaeloa Partners, LP (KPLP), and Hamakua Energy Power (HEP).

(3) CIPGS (Campbell Industrial Park Generating Station) is designated as the Main CSP for the Hawaiian Electric Companies' Emissions Reduction Plan.

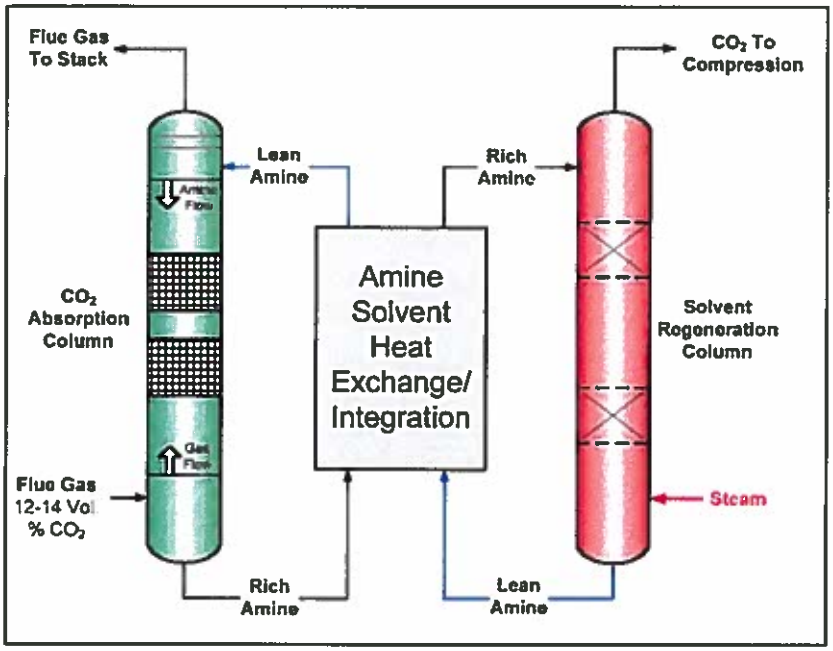
Table A-2: Substitute 2019 GHG Limits for PGV Outage

Company	Covered Source	PGV 100% Operation CO2e Emissions Limit (tpy)	Calendar Year 2019 GHG Limits GHG Limit Adjustment (tpy)	Calendar Year 2019 GHG Limits CO_2e Emissions Limit (tpy)
HECO	Kahe	2,133,752	0	2,133,752
	Waiau	808,286	0	808,286
	Honolulu	0	0	0
	CIPGS	53,740	0	53,740
HE Subtotal		2,995,778	0	2,995,778
MECO	Kahului	154,633	0	154,633
	Maalaea	459,864	0	459,864
	Palaau	26,454	0	26,454
ME Subtotal		640,951	0	640,951
HELCO	Kanoelehua-Hill	172,456	17,132	189,588
	Keahole	242,208	31,213	273,421
	Puna	31,747	39,535	71,282
	Shipman	0	0	0
HEL Subtotal		446,411	87,880	534,291
Hawaiian Electric Companies		**4,083,140**	**87,880**	**4,171,020**
AES Hawai'i		**1,691,605**	**0**	**1,691,605**
Hamakua Energy Power		**153,699**	**97,524**	**251,223**
Kalaeloa Partners, LP		**1,094,813**	**0**	**1,094,813**
Partnership Total		**7,023,257**	**185,404**	**7,208,661**

Carbon Capture and Storage

Carbon Capture and Storage (CCS) is composed of two major functions; CO_2 capture and CO_2 storage. A number of methods may potentially be used for separating the CO_2 from the exhaust gas stream, including adsorption, physical absorption, chemical absorption, cryogenic separation, and membrane separation (Wang et al., 2011). Many of these methods are either still in development or not suitable for treating power plant flue gas due to the characteristics of the exhaust stream (Wang, 2011; IPCC, 2005). Of the potentially applicable post-combustion CO_2 capture options, the use of an amine solvent such as monoethanolamine (MEA) it is the most mature and well-documented technology (Kvamsdal et al., 2011). Figure B-1 illustrates the amine-based post-combustion capture process.

FIGURE B-1 SCHEMATIC DIAGRAM OF AMINE-BASED CO_2 CAPTURE PROCESS



Source: Interagency Task Force on Carbon Capture and Storage, 2010

EPA generally considers post-combustion CO_2 capture with an amine solvent to be technically feasible for natural gas fired combined cycle combustion turbines and coal fired power plants. However, this technology has not been demonstrated on simple cycle combustion turbines and reciprocating engines. Part of the reason is that the flue gas temperature from simple cycle turbines and reciprocating engines is much higher than from combined cycle turbines and boilers so the gases have to be cooled prior to scrubbing going to the CO_2 absorption column. While still feasible, that adds cost and makes it less economically practical. A more fundamental difficulty with using amine absorption for combustion turbines of either type as well as reciprocating engines is that the CO_2 concentration in the flue gas is

lower than 6 percent. That concentration is much lower than other types of power plants, such as coal fired power plants, where the CO_2 concentration may be as high as 12-15 percent by volume in the post combustion flue gas stream. As a result, the amine system equipment has to be more than twice as large for the same amount of CO_2 captured. That greatly increases the treatment cost. Although significant challenges exist, CCS cost estimates are provided in Tables B-1 and B-2. The data in the tables do not reflect the higher cost associated with treating low-CO_2 concentration flue gases from combustion turbines and reciprocating engines.

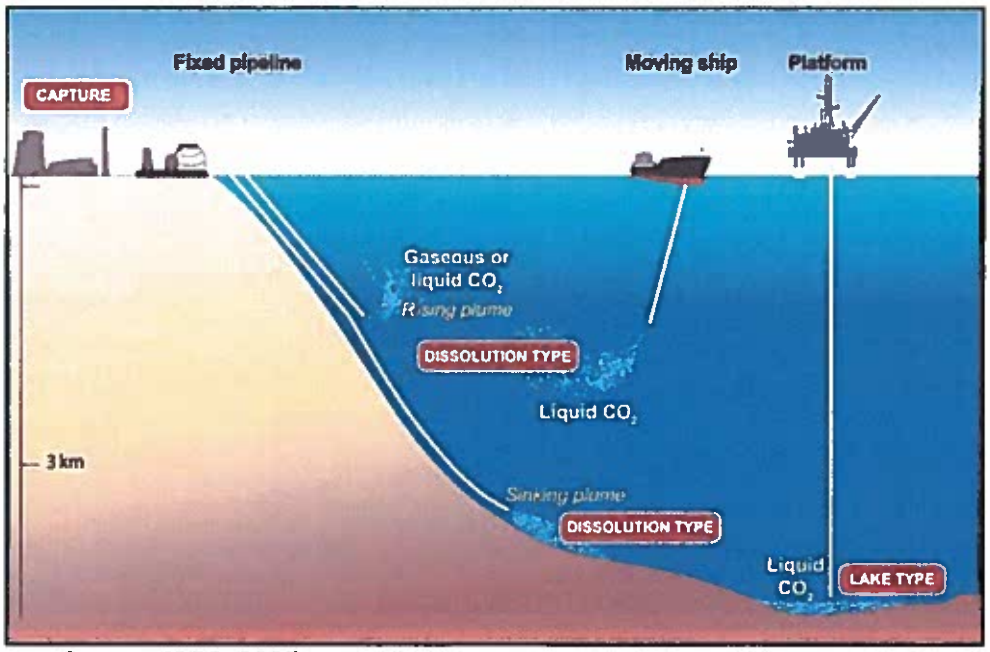
Hawai'i's remote location imposes many additional challenges implementing CO_2 storage that are not present for continental U.S. sources. Hawaiian Electric is not aware of any proven CO_2 geological storage sites on Hawai'i. Therefore, ocean storage, i.e., direct CO_2 release into the ocean water column or onto the deep seafloor, appears to be the most readily available CO_2 storage option.

As shown in Figure B-2, CO_2 ocean storage potentially could be implemented in two ways:

- By injecting and dissolving CO_2 into the water column (typically below 1,000 meters) via a fixed pipeline or a moving ship, or
- By depositing CO_2 via a fixed pipeline or an offshore platform onto the sea floor at depths below 3,000 m, where CO_2 is denser than water and is expected to form a "lake" that would delay dissolution of CO_2 into the surrounding environment.

Ocean storage and its ecological impacts are still in the research phase and the legal status of intentional ocean storage is unknown (Herzog, 2010; IPCC, 2005; Purdy, 2006).

FIGURE B-2 OVERVIEW OF OCEAN STORAGE CONCEPTS



Source: IPCC, 2005

Attachment B – Carbon Capture and Storage

The first step to costing CCS is calculating CO_2 emission rates. CO_2 emissions from power generation are a function of fuel type and the heat rate of the generating unit. Due to the large number of generating units and the various current and future fuel types, the costing is based on typical generating unit configurations.

Table B-1 lists the estimated total annual cost on a $/million Btu (MBtu) basis to add CCS based on fuel type. The estimate includes the amine absorber system cost, the onshore CO_2 storage cost, and the ocean injection cost. The total annual estimated cost ranges from $5.64 to $7.99 per MBtu of heat input.

As noted earlier, due to the absence of suitable subterranean formations, geological storage does not appear to be a viable option in Hawai'i. Even if available, using geological storage instead of ocean storage would not lower the cost. The listed estimated total ocean CO_2 storage cost of $13.80 per ton ($2.00 + $4.81 + $6.99 = $13.80) is actually lower than the estimated total cost for geological storage ($8.53 to $19.51 per ton)[14].

Table B-2 lists the estimated total annual cost for CCS on a $/kW basis for various fuel and generating unit types. These costs range from 7¢ to 10¢ per kWh based on maximum operation. These costs would be higher based on actual operating levels. That means that power cost to customers would have to increase 25% or more from 2016 rates, depending on location, to pay for CCS.

[14] Table 9 of the National Energy Technology Laboratory report "Quality Guidelines for Energy System Studies: Estimating Carbon Dioxide Transport and Storage Costs" (DOE/NETL-2013/1614), dated March 14, 2013.

TABLE B-1 ESTIMATED TOTAL ANNUAL CCS COST ($/MBTU)

Carbon Capture and Storage (CCS) Component	Cost ($/ton CO_2 Captured)	CO_2 Emissions[1] (lb/MMBtu)	% Captured[2]	CO_2 Emissions Captured (lb/MMBtu)	Total Annual Cost ($/MMBtu)
No. 6 Fuel Oil					
CO_2 Capture and Compression[3]	93.44	165.6	90%	149	$6.96
Onshore CO_2 Storage[4]	2.00				$0.15
Ship transport to injection ship[4]	4.81				$0.36
Injection ship, pipe and nozzle[4]	6.99				$0.52
Total Cost (Biodiesel)	107.24				$7.99
No. 2 Fuel Oil					
CO_2 Capture and Compression[3]	93.44	163.1	90%	147	$6.87
Onshore CO_2 Storage[4]	2.00				$0.15
Ship transport to injection ship[4]	4.81				$0.35
Injection ship, pipe and nozzle[4]	6.99				$0.51
Total Cost (Diesel)	107.24				$7.88
Natural Gas					
CO_2 Capture and Compression[3]	93.44	117.0	90%	105	$4.91
Onshore CO_2 Storage[4]	2.00				$0.11
Ship transport to injection ship[4]	4.81				$0.25
Injection ship, pipe and nozzle[4]	6.99				$0.37
Total Cost (Natural Gas)	107.24				$5.64

Notes:

1. Emission factors from the Mandatory Greenhouse Gas Reporting rule (40 CFR Part 98 Subpart C, Table C-1).
2. Typical value for amine absorber systems (Interagency Task Force on Carbon Capture and Storage, 2010; NETL, 2013).
3. The CO_2 capture and compression cost is based on information presented in Figure III-1 of the Report of the Interagency Task Force on CCS, dated August 2010. The listed dollar per ton of CO_2 captured is the cost of applying post-combustion CCS to an existing natural gas fired combined cycle power plant. The listed cost ($103 per metric ton or $93.44 per ton) is based on continuous operation (8,760 hrs per unit per year at base load for each fuel type).
4. Costs are from Table 6.6 of the IPCC Special Report on Carbon Dioxide Capture and Storage, dated 2005.

TABLE B-2 ESTIMATED TOTAL ANNUAL CCS COST ($/KWH)

Unit Type	Typical Heat Rate (Btu/kWh)	Fuel Type	Total Annual Cost ($/MMBtu)	CO_2 Removal Cost ($/kWh)
Boiler	12,000	No. 6 Fuel Oil	$7.99	0.10
		No. 2 Fuel Oil	$7.88	0.09
		Natural Gas	$5.64	0.07
Simple Cycle Combustion Turbine	9,500	No. 2 Fuel Oil	$7.88	0.09
		Natural Gas	$5.64	0.07
Combined Cycle Combustion Turbine	7,500	No. 2 Fuel Oil	$7.88	0.09
		Natural Gas	$5.64	0.07
Reciprocating Engine	8,000	No. 2 Fuel Oil	$7.88	0.09
		Natural Gas	$5.64	0.07

Note - Costs are based on continuous operation at base load. Costs based on actual operating levels would be higher.

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Herzog, H.J., 2010. Scaling up carbon dioxide capture and storage: From megatons to gigatons, *Energy Econ.* doi:10.1016/j.eneco.2010.11.004

Interagency Task Force on Carbon Capture and Storage, 2010. "Report of the Interagency Task Force on Carbon Capture and Storage," dated August 2010.

Intergovernmental Panel on Climate Change, 2005. IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

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Purdy, Ray, 2006. The Legal Implications of Carbon Capture and Storage Under the Sea. Sustainable Development Law and Policy, Fall 2006, 22-26

Wang, M., Lawal, A., Stephenson, P., Sidders, J., & Ramshaw, C., 2011. Post-combustion CO_2 capture with chemical absorption: A state-of-the-art review. Chemical Engineering Research and Design, 89, 1609-1624.

Natural Gas Conversion GHG Emissions Reduction

The Hawaiian Electric Companies pursued importation of liquefied natural gas (LNG) to lower fuel costs and air emissions, including GHG. However, after the PUC denied the merger of the Hawaiian Electric Companies with NextEra[15] the Companies withdrew their application for approval of LNG Supply Agreements.

Substitution of natural gas fuel can significantly reduce GHG emissions from power generation. To the extent that LNG replaces no. 2 (diesel) fuel oil and no. 6 fuel oil, GHG emissions are 28 to 30 percent lower per million Btu (MBtu) of fuel heat input as shown by the emissions factors in Table C-1. Net GHG emissions are reduced by a lesser amount, probably in the 25-28% range, because more heat input is typically required from gas than oil for the same amount of power generated. It is unlikely that LNG would make up 100% of the Companies' fuel consumption so the overall GHG reduction would be correspondingly lower.

TABLE C-1 NATURAL GAS CONVERSION CO_2 EMISSIONS REDUCTION CALCULATION

Fuel	GHG Pollutant[1]	Emission Factor[2] (kg/MMBtu)	Global Warming Potential[3]	Total GHG Emissions as CO_2e (lb/MMBtu)
No. 6 Fuel Oil	CO_2	75.10	1	165.6
	N_2O	6.0E-04	298	0.3942
	CH_4	3.0E-03	25	0.1653
			Total CO_2e =	**166.2**
No. 2 Fuel Oil	CO_2	73.96	1	163.1
	N_2O	6.0E-04	298	0.3942
	CH_4	3.0E-03	25	0.1653
			Total CO_2e =	**163.7**
Natural Gas	CO_2	53.06	1	117.0
	N_2O	1.0E-04	298	0.0657
	CH_4	1.0E-03	25	0.0551
			Total CO_2e =	**117.1**
No. 6 Fuel Oil to Natural Gas Reduction = 29.5%				
No. 2 Fuel Oil to Natural Gas Reduction = 28.4%				

Notes:

1. Greenhouse Gas (GHG) pollutants from the Mandatory Greenhouse Gas Reporting rule (40 CFR §98.32).
2. Emission factors from the Mandatory Greenhouse Gas Reporting rule (40 CFR Part 98 Subpart C, Tables C-1 and C-2).
3. Global Warming Potentials from the Mandatory Greenhouse Gas Reporting rule (40 CFR Part 98 Subpart A, Table A-1).

[15] Public Utilities Commission of the State of Hawai'i Decision and Order No. 33795. July 15, 2016.

Biofuel Conversion GHG Emissions Reduction

1. Availability

Biodiesel has been used as fuel for power generation on a limited scale but there is not enough supply to replace a significant portion of the fuel consumed by the Hawaiian Electric Companies. According to the U.S. Energy Information Administration (EIA) Biodiesel Production Report for July 2018, biodiesel (as B100) production capacity in Hawai'i was only about 6 million gallons per year (MGY). Campbell Industrial Park (CIPGS) alone burned 7.7 million gallons in 2017. U.S. production capacity was 2370 MGY but only 209 MGY of that was on the west coast where delivery to Hawai'i would be practical. By comparison, the Hawaiian Electric Companies used 370 million gallons of residual and distillate fuels in 2013.

In order for biodiesel to become sufficiently available to provide fuel for the State's electricity needs, dedicated energy crops would be required. But it is uncertain whether those crops would be adequate for the competing fuel needs throughout the State. Furthermore, biodiesel production is constrained by limited land availability and unpredictable financial incentives. A 2010 study on the potential for biofuel production in Hawai'i concluded that biodiesel produced from waste fats, oils, and greases would account for only one half of one percent of current diesel fuel usage (B&V, 2010). The same study estimated the theoretical biodiesel potential from waste oil as 2 to 2.5 million gallons per year (MGY).

Hawaiian Electric recently obtained a contract with Pacific Biodiesel to purchase approximately 3 MGY of biodiesel, primarily for CIPGS. At this time, Pacific Biodiesel is the only producer of biodiesel located in the State of Hawai'i. Another company, Imperium Renewables Hawai'i, announced plans to develop and build a biodiesel plant in Kapolei (O'ahu) several years ago but the project was unsuccessful due to financial reasons. Subsequently, the PUC rejected Hawaiian Electric's proposal to import biodiesel from Imperium's production plant in Washington State because of high costs. To the extent possible, Hawaiian Electric and the PUC would prefer to use locally-produced biofuels. But there simply is not enough biodiesel supply available to significantly lower Hawaiian Electric's greenhouse gas emissions without drastically increasing the cost.

2. Cost

Table D-1 summarizes Hawaiian Electric's April 2015 fuel price forecasts. Historically, biodiesel has not been economically competitive compared to petroleum diesel without some type of governmental incentive. Our forecast shows that through 2019, the price of biodiesel will be approximately double that of our current fuel mix.

In addition to fuel cost, capital cost would be necessary to provide the infrastructure for receiving and storing biodiesel. Indirect costs such as permitting, performance testing, and engineering would likely add to the overall cost of switching to biodiesel. From an energy standpoint, biodiesel is similar to traditional diesel but contains about 7-10% less energy per gallon. Thus, the cost of biodiesel compared to diesel is higher but the energy content is lower.

Biodiesel prices are expected to continue to rise. Although current generation biodiesel production facilities are more efficient and benefit from economies of scale, feedstock costs have remained high (B&V, 2010). Generally, waste oils are the least expensive but are not always available in large quantities. Furthermore, the U.S. biodiesel industry is highly dependent on financial incentives such as the Federal blender tax credit. The unpredictability of the biofuel market does not align with Hawaiian Electric's priority to provide reliable and low cost electricity. Further, we believe that it is questionable whether the PUC will approve large-scale conversions to biodiesel because of the potential cost impact on the Companies' customers.

TABLE D-1 BIODIESEL FUEL COST COMPARISON

Hawaiian Electric's 2018 Fuel Price Forecast				
	$/million Btu			
Year	No. 2 Diesel	LSFO	ULSD	Biodiesel
2018	15.82	13.08	16.88	31.84
2019	14.96	12.17	16.02	31.76
2020	15.86	12.99	16.96	32.93
2021	16.20	13.26	17.32	33.71

References

EIA (U.S. Energy Information Administration), 2015. "Monthly Biodiesel Production Report," dated March 2015.

B&V (Black and Veatch Corp.), 2010. "The Potential for Biofuels Production in Hawai'i," dated January 2010.

Hawaiian Electric, 2018 Fuel Price Forecast. Received from C. Reyes 7/6/2018.

Potential Energy Efficiency Improvements

Improving the efficiency when fuel energy is converted to usable power output reduces the amount of fuel that has to be combusted to satisfy power demand, in turn decreasing the emissions of greenhouse gases and other air pollutants that are created in the combustion process. Additionally, improved energy efficiency reduces the cost of power generation because of the lower fuel requirement.

Energy efficiency of power generating units can be improved though changes to technology (equipment), processes, and practices. But most of the cost-effective improvements available to power generators have already been made to reduce fuel cost since fuel is such a large part of the total cost of power generation. That is especially true for Electrical Generating Units (EGU) like Hawaiian Electric's that burn oil, which is a relatively high cost fuel. Energy efficiency improvement is one of the four Building Blocks that EPA relied on to develop its proposed *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units*.[16] In the preamble to the proposed rule EPA stated that they decided not to include efficiency improvement by oil-fired EGUs as an element of their Best System for Emissions Reduction (BSER) evaluation for GHG emissions because the potential GHG reductions are small compared to the reductions available from other types of power generation.[17]

Nevertheless, potential energy efficiency improvements for the Hawaiian Electric Companies' boilers, combustion turbines, and diesel electric generator sets are discussed in this section.

Boilers

The major portion of the Hawaiian Electric Companies' power generation comes from boilers that power steam turbine electric generators. The Hawaiian Electric Companies operate their boilers as efficiently as practicable. An important incentive for doing so is that the PUC establishes efficiency standards that must be met for the Company to fully recover the cost of the fuel used in power generation. Hawaiian Electric assures that its boilers operate at optimal energy efficiency a number of ways. One is by daily tracking and reporting of Heat Rate (HR) for each unit. Heat Rate, a measure of overall power generation efficiency that is commonly used in the power generation industry, is the ratio of the total fuel energy input divided by the net amount of power exported to customers, usually reported as Btu of fuel energy consumed per Kilowatt-hour of power exported (Btu/KWh). The lower the Heat Rate, the more efficiently the unit is operating. Heat Rate trends are a sensitive indicator of efficiency changes somewhere in the system. The Hawaiian Electric Companies also have aggressive Heat Rate improvement programs that follow the guidelines developed by the Electric Power Research

[16] 79 Fed. Reg. 34830, June 18, 2014.

[17] Ibid. p. 34877.

Institute (EPRI).[18] Those guidelines are based on the best practices used in the industry for improving and maintaining energy efficiency.

Maui Electric's four boilers and Hawai'i Electric Light's two boilers underwent energy assessments and tune-ups in 2014 that were required by 40 CFR Part 63 Subpart JJJJJJ, NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources. The assessments, performed by a certified independent combustion engineer, concluded that the overall condition of the boilers is good and that good efficiency practices are followed. All the Maui Electric and Hawai'i Electric Light boilers are tested annually to confirm their efficiency and tune-ups are required under Subpart JJJJJJ once every five years.

Hawaiian Electric's boilers compare favorably for energy efficiency with other oil-fired EGUs in the U.S. The Energy Information Administration (EIA) collects and publishes Heat Rate data for several categories of EGUs. For the 2009 to 2013 period, EIA reported that the average HR for petroleum-fired EGUs was 10.9 MBtu/MWh.[19] By comparison, Hawaiian Electric's fourteen boilers on O'ahu averaged lower than 10.6 MBtu/MWh Heat Rate in the first 6 months of 2015. That is very good performance given the Hawaiian Electric boilers' operating rates.

Traditional style power plants were designed to operate near full capacity, often termed base-loaded, where they are most efficient. Operating them at lower and varying loads reduces their efficiency. Hawaiian Electric's boilers operate below full capacity. During 2012 through 2014, for instance, their average operating load was less than 60% of online capacity. There are two reasons for the lower load. One is that, unlike utilities on the mainland, Hawaiian Electric operates an isolated system. It cannot draw power from neighboring utilities in the event of system upsets so it must be entirely self-sufficient. To protect against power outages, Hawaiian Electric keeps enough unused generation capacity online as spinning reserve to absorb unexpected loss of the largest generation facility that is operating at any time.

Another factor that keeps operating load lower than ideal is imposed by the increasing amount of renewable energy that has been integrated into Hawaiian Electric's system. The output for renewable energy sources such as solar and wind is variable and intermittent because clouds reduce solar panel output and variable wind speeds reduce windmill output. Consequently, Hawaiian Electric's boilers must vary their operation in order to match overall system output with demand. The result of those constraints on operating load is that Hawaiian Electric's boilers typically operate below their peak efficiencies. Despite these constraints, as noted above, their HRs are competitive with those of mainland utilities, which generally do not have the same constraints.

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[18] *Heat Rate Improvement Guidelines.* EPRI, Palo Alto, CA: 2012. Publication 1023913.

[19] *Electric Power Annual.* U.S. EIA. March 23, 2015 release, Table 8.1.

Attachment E – Potential Energy Efficiency Improvements

Combustion Turbines

Combustion Turbines (CT) represent the Hawaiian Electric Companies' second-largest source of power generation. The Company operates three CTs on O'ahu, four on Maui, and five on Hawai'i Island.

The energy efficiency of CTs is highest when they operate in combined cycle mode rather than simple cycle. In simple cycle, the hot gases from the turbine are exhausted to the atmosphere, whereas in combined cycle hot exhaust gases pass through a heat recovery steam generator, where steam passes through a turbine to generate additional power.

All four of Maui's and two of Hawai'i Island's CTs are capable of operating in combined cycle mode. No other significant energy efficiency improvements have been identified.

The remaining three CTs on Hawai'i Island and three on O'ahu are simple cycle units. Although their energy efficiency could be improved by converting them to combined cycle, the Companies evaluated doing so and concluded that it would not be feasible given the function that the simple cycle CTs serve on the current system. These units operate less than 10 percent of the time and instead are used to provide fast response power in case of shortages on the system. Unlike boilers, which take a long time to start up, simple-cycle CTs can be started up quickly when needed. In contrast, it takes significantly longer to bring a combined-cycle CT fully online. Operating the current simple-cycle CTs in combined-cycle mode would defeat much of the reason they are used. Hawaiian Electric has not identified any energy efficiency improvements for its CTs that fit within the current design of its system. That does not rule out system design changes that could accommodate combined cycle combustion turbines; however, such changes could not be implemented before 2020, the compliance date for Act 234 units.

Diesel Electric Generators

Diesel electric generators (DEGs) have generally lower power output capability than boilers or combustion turbines and are mainly used to serve lower loads, typically in remote locations. DEGs also have the advantage that they can be brought online and ramped up quickly.

The Hawaiian Electric Companies operate DEGs that range in size from 1 MW to 12.5 MW each.

Hawaiian Electric received the following information from Valley Power Systems Northwest. Valley Power has supplied diesel generation equipment to the Hawaiian Electric Companies and is familiar with their DEGs.[20] Diesel electric generators are generally very efficient in converting fuel energy into electric power. There are few options available for improving their energy efficiency. One option is to install a turbocharger if a unit is not already equipped with one. However, all the DEGs covered by the Companies GHG Partnership already are equipped with

[20] Verbal communication between Dave Peterson of Valley Power Systems Northwest and Greg Narum of Hawaiian Electric, March 20, 2015.

turbochargers. Another option is to upgrade from 2-pass to 4-pass after-coolers, which can improve efficiency 1-3%. However, this may not be practical for Hawaiian Electric Companies' units because of their age and design. The benefit in terms of GHG emissions reduction would be small in any case, amounting to about 120 metric tons per year of CO2e for a 2% efficiency improvement of a 1 MW generator.

An approach that would more substantially reduce GHG emissions would be to replace the existing diesel engine generators with newer, more efficient models. Hawaiian Electric estimates that heat rates could be improved 10% to 20%, depending on the unit, by replacing the Companies' larger DEGs with new units similar to those constructed at the Schofield Generating Station.[21] According to data Hawaiian Electric submitted to the Public Utilities Commission, the 2015 installed cost for new DEG capacity up to 100MW is $2970/KWh.[22] Assuming a 15% heat rate improvement averaged over all the units, the fuel cost savings would be about $280 per year per KW of capacity based on estimated 2015 fuel costs[23] and 8500 hours per year of operation. Therefore, it would require about 10 years for the energy savings to pay back the investment cost. That cost can only be justified if the existing unit is nearing the end of its useful life.

Summary of Potential Energy Efficiency Improvements

The Hawaiian Electric Companies operate their power generating units at energy efficiencies that are equivalent to or better than mainland averages for oil-fired generators despite constraints imposed by their isolated location. The Company has researched additional opportunities for improving efficiency beyond steps already taken but has not identified any that are operationally and economically justified given current system designs and needs.

[21] Email from Robert Isler of Hawaiian Electric Generation Planning Department. June 22, 2015.

[22] *Hawaiian Electric Power Supply Improvement Plan.* Table F-11. Docket 2011-0206. August 2014.

[23] Ibid, Table F-5.

Attachment F – Puna Geothermal Venture Equivalent GHG Emissions

The equivalent GHG emissions reduction from PGV's energy generation was calculated by comparing the combined actual emissions from Hawai'i Electric Light and HEP in 2017, the last full year PGV operated, with the 12 months from July 2018 to June 2019 when PGV was offline. The difference, 185,404 tons, was distributed among the generating facilities in proportion to their July 2018 to June 2019 operation. The result is tabulated in Table A-2.

The derivation of PGV's equivalent GHG emissions is summarized below.

Hawai'i Island Fossil Fuel GHG Emissions

Source	GHG Emissions, tons	
	PGV Online 2017	PGV Offline July 2018-June 2019
HELCO		
Keahole	193,103	260,090
Kaneolehua-Hill	243,346	180,345
Puna	26,400	67,806
HEP	98,962	238,974
HELCO-HEP Total	561,811	747,215
GHG Adjustment for PGV		**185,404**

Revised Form S-6
Campbell Industrial Park Generating Station
CSP No. 0548-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. CIP1 is a Siemens Westinghouse Power Corporation SGT6-3000E (135 MW nominal) combustion turbine.
2. Fuel type. CIP1 is currently permitted to burn naphtha, fuel oil No. 2, biodiesel (B100 and B99), and blends of fuel oil No. 2 and biodiesel (B100 and B99) with a maximum sulfur content of 0.05% by weight.
3. Fuel use. CIP1 has a maximum hourly fuel consumption rate of 1,482.6 MMBtu/hr.
4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change CIP1's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.
No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   NO_X emissions are controlled by water injection. SO_2 emissions are controlled by limiting the biodiesel fuel sulfur content to 50 ppm. Emissions of PM, PM_{10}, $PM_{2.5}$, CO, and VOC are controlled by combustion design and good combustion practices. Emissions of any hazardous air pollutants are controlled by the use of No. 2 diesel or biodiesel and combustion system design.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. Depending on future dispatch requirements, the plant may cycle off-line daily, or operate at reduced loads. While these expected operating levels are less than continuous, there may be times when a unit must be run continuously for extended periods of time. Thus, this application does not include any daily, weekly, or monthly operating limits.
2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Refer to I.C.1 above.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

Hawaiian Electric requests incorporation of the Greenhouse Gas emissions limitations into the Covered Source Permit CSP No. 0548-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan (GHG ERP) submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.

IX. The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.

X. The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.

XI. Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.

Revised Form S-6
Kahe Generating Station
CSP No. 0240-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.

   - Fuel oil No. 6 with maximum sulfur content of 0.5% by weight for Units K-1 through K6.
   - Fuel oil No. 2 with maximum sulfur content 0.5% by weight for Units A and B.
   - A maximum of 115,000 gal/yr of specification (spec) used oil for Units K-1 through K-4.
   - Propane as igniter fuel for K-1 and K-2.
   - Fuel oil No. 2 with maximum sulfur content of 0.5% by weight as igniter fuel for K-3 through K-6.
   - Fuel oil No. 2 (diesel) with maximum 0.5% by weight sulfur as an alternate fuel for Boilers K-1 through K-6 as approved by the DOH on June 7, 2013.
   - Natural gas as alternate fuel for boilers K-1 through K-6 as approved by DOH on January 5, 2015.
3. Fuel use. Refer to the table below.

Maximum Design Fuel Use per Unit

Unit ID	Nominal Capacity	Heat Input (MMBtu/hr)	Ignition Fuel
K-1	92 MW	903	Propane
K-2	90 MW	900	Propane
K-3	92 MW	892	Diesel
K-4	93 MW	918	Diesel
K-5	142 MW	1,468	Diesel
K-6	142 MW	1,516	Diesel
A	2.5 MW	30.5	Diesel
B	2.5 MW	30.5	Diesel

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Kahe equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Sulfur emissions are controlled by limiting the fuel sulfur content to 0.5 percent by weight. Emissions of NO_x, PM, PM_{10}, CO, and VOC are controlled by combustion design and good combustion practices. Emissions of other HAP's are controlled by the use of No. 2 and No. 6 fuel oil and combustion system design. Unit 6 is equipped with low NO_x burners to control NO_x emissions.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. Depending on future power dispatch requirements, specific boilers may cycle off-line daily, or operate at reduced loads. However, there may be times when a unit must be run continuously for extended periods of time. Thus, this application does not include any annual operating limits for Units K-1 through K-5. Unit K-6 is limited to a daily average fuel consumption of 8,610 gal/hr. Units A and B are limited to a combined annual operating hour limit of 300 hours.
2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Refer to I.C.1 above.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

Hawaiian Electric requests incorporation of the Greenhouse Gas emissions limitations into the Covered Source Permit CSP No. 0240-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan (GHG ERP) submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not Applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. **After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.**

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Waiau Generating Station
CSP No. 0239-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.
   - Fuel oil No. 6 with a maximum sulfur content of 0.5% by weight for Units 3 through 8.
   - Natural gas with maximum sulfur content of 175 grains per 100 SCF for Units 5 through 8.
   - Specification used oil for Units 3 through 8 (no more than 50,000 gallons per any rolling 12-month period).
   - Fuel oil No. 2 with a maximum sulfur content of 0.5% by weight for Units 9 and 10.
3. Fuel use. Refer to the table below.

Maximum Capacity and Fuel Use Per Unit

Unit ID	Manufacturer	Model Number	Serial Number	Capacity (Nominal)	Fuel Rate (MMBtu/hr)	Ignition Fuel
3	Babcock and Wilcox		RB-43	49 MW	576	Propane
4	Babcock and Wilcox		RB-92	49 MW	585	Propane
5	Babcock and Wilcox		RB-324	57 MW	633	Propane
6	Babcock and Wilcox		RB-328	58 MW	637	Propane
7	Combustion Engineering		20694	92 MW	923	Diesel
8	Combustion Engineering		20177	92 MW	922	Diesel
9	General Electric	MS7000	217725	50	682	Diesel
10	General Electric	MS7000	217724	52	691	Diesel

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Waiau equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

Several types of alternative operating scenarios apply to the generating station as described

below:

a. Unit operation during startup, shutdown, maintenance and testing of the combustion turbine generators and boilers. Boiler startup operations may range up to 7 hours and occur almost daily.

b. Alternate fuels. Hawaiian Electric may use alternate fuels and fuel additives with prior approval from the Department of Health.

c. Soot blowing is a necessary maintenance operation and may result in a temporary increase in opacity.

d. Use of a temporary replacement unit in the event of a failure or major overhaul of an installed unit. In the event that the projected down time of the unit increases the likelihood of an interruption in electrical service, the down unit may be replaced with an equivalent unit. Emissions from the replacement unit will comply with the original unit's permitted emission limits.

e. Operate the combustion turbines, W9 and W10, below minimum load to address system disturbances and frequency issues. This request was submitted in a minor modification application dated May 6, 2015.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Sulfur emissions are controlled by limiting the fuel sulfur content to a maximum of 0.5% by weight. Emissions of NO_x, PM, PM_{10}, CO, and VOC are controlled by combustion design and good combustion practices. Emissions of any hazardous air pollutants are controlled by the use of fuel oil Nos. 6 and 2 and good combustion design.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. Depending on future dispatch requirements, the plant may cycle off line daily, or operate at reduced loads. While these expected operating levels are less than continuous, there may be times when the units must be run continuously for extended periods of time. Thus, this application does not propose any annual operating limits.
2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Refer to I.C.1 above.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

Hawaiian Electric requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0239-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.

IX. The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.

X. The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.

XI. Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.

Revised Form S-6
Honolulu Generating Station
CSP No. 0238-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Units 8 and 9 are Babcock & Wilcox boilers with steam turbines. See response to I.A.3 for additional information.
2. Fuel type. No. 6 and No. 2 fuel oil with 0.5% (max) by weight sulfur content for Units 8 and 9. The boilers also burn small quantities of spec used oil (less than 15,000 gal/yr).
3. Fuel use. Refer to the table below.

Maximum Design Fuel Use per Unit

Unit ID	Nominal Capacity	Fuel Rate	Ignition Fuel
Unit 8	56 MW	589.0 MMBtu/hr	Propane
Unit 9	57 MW	631.5 MMBtu/hr	Propane

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Honolulu equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation through combustion of fossil fuels (SICC 4911) is the only product or process.

The alternative scenario is the ability to switch fuels. Should cheaper fuels become available, or the supply of No. 2 or No. 6 fuel becomes limited, Hawaiian Electric may propose an alternate scenario that would allow the fuel switch, provided that all permit conditions are met.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Sulfur emissions are controlled by limiting the fuel sulfur content to 0.5 percent by weight. Emissions of NO_x, PM, PM_{10}, CO, and VOC are controlled by combustion design and good combustion practices. Emissions of any hazardous pollutants are controlled by the use of No. 2 and No. 6 fuel oils and combustion system design.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. The planned operation of Units 8 and 9 is 24 hours per day 7 days a week. Depending on future dispatch requirements, the plant may cycle off-line daily, or operate at reduced loads. Unit 8 and 9 are currently deactivated.
2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Unit 8 and 9 are currently deactivated.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

   See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

   Hawaiian Electric requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0238-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available

background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. **After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.**

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Kanoelehua-Hill Generating Station
CSP No. 0234-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.

   - Hill 5 and 6 utilize fuel oils No. 6 and No. 2.
   - Hill 5 uses propane as an ignition fuel.
   - CT-1 utilizes fuel oil No. 2 with a maximum sulfur content of 0.4 percent by weight.
   - D-11, D-15, D-16, and D-17 utilize fuel oil No. 2 with a maximum sulfur content of 0.0015 percent by weight and a minimum Cetane index of 40 or a maximum aromatic content of 35 volume percent.
   - Hill 5 and Hill 6 may consume up to 36,500 gal/rolling 12-month period of specification used oil. On November 22, 2017, the DOH approved consumption of specification used oil from Hawaii Petroleum.
   - Hawai'i Electric Light requested the addition of biodiesel and biodiesel/diesel blends in D-11, D-15, D-16, and D-17 in a permit renewal application dated August 31, 2012.

3. Fuel use. Refer to the table below.

Maximum Design Fuel Use per Unit

ID	Capacity (Nominal)	Fuel Flow (MMBtu/hr)	Ignition Fuel
Hill 5	14 MW	197	Diesel/ Propane
Hill 6	23 MW	249	Diesel
CT-1	11.6 MW	177.2	Diesel
D-11	2.0 MW	20.2	Diesel
D-15	2.5 MW	29.1	Diesel
D-16	2.5 MW	29.1	Diesel
D-17	2.5 MW	29.1	Diesel

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Kanoelehua-Hill equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

Several types of alternative operating scenarios apply to the plant. The first includes the use of permanent and temporary replacement units in the event of a failure or major overhaul of an installed unit. In the event that the projected downtime of the installed unit increases the likelihood of an interruption in electrical service, the installed unit would be replaced with an equivalent unit. Emissions from the replacement unit will comply with the original unit's emission limits.

The second alternative operating scenario is unit operation during start-up, shutdown, maintenance and testing. Boiler startup operations may range up to 7 hours. Maintenance activities include soot blowing. The time period of this maintenance operation will not exceed 1.5-hours in duration two times per day. These maintenance activities are required to maximize generation efficiency and minimizing fuel usage.

A third alternate scenario is the ability to switch fuels. Should cheaper fuels become available, or the supply of normal fuel become limited, Hawai'i Electric Light proposes an alternate scenario that would allow the fuel switch provided that all permit conditions are met.

A fourth alternative scenario occurs during emergency load conditions. Certain equipment malfunctions (such as sudden loss of a unit) may necessitate the operation of Hill 5 and 6, CT-1 and D-11, D-15, D-16, and D-17, at loads as high as 110% of peak load. The time period of this operation will be limited to no more than 30 minutes in duration. This operation will not result in a 3-hr average emission rate that exceeds the maximum emission limits proposed in this application.

A fifth alternative involves the use of fuel additives to reduce corrosion, control biological growth, and enhance combustion, etc. Emissions during this scenario will not affect emission estimates.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Sulfur emissions are controlled by limiting the fuel sulfur content to 0.4% by weight for CT-1, 0.0015% for the diesels, and 2% for the boilers. Emissions of PM_{10}, CO, and VOC are controlled by combustion design. CO emissions from D-11, D-15, D-16, and D-17 are controlled by the Diesel Oxidation Catalyst (DOC). The DOC will reduce CO emissions by at least 70 percent or limit CO emissions to 23 ppmvd at 15 percent O_2. Emissions of any hazardous pollutants are controlled by the use of No. 2 diesel oil for CT-1, D-11, D-15, D-16, and D-17 and No. 6 fuel oil used for the boilers and combustion system design for all units.

   Compliance monitoring devices and activities are discussed in Form C-2.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. The planned operation of each unit is 24 hours per day, 365 days per year. Depending on future dispatch requirements, some units may cycle off-line daily, or operate at reduced loads. While these expected operating levels are less than continuous, there may be times when the units must be run continuously for extended periods of time. Thus, this application does not propose any annual operating limits.
2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Operation is not seasonal or irregular.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

With this application, Hawai'i Electric Light requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0234-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not Applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Does not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other

application requirements of subchapter 7. Does not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Keahole Generating Station
CSP No. 0007-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.

   - No. 2 diesel fuel with 0.4 percent by weight maximum sulfur content for units CT-4, CT-5, and BS-1.

   - Starting May 3, 2013, No. 2 diesel with 0.0015 percent by weight sulfur content, minimum Cetane index of 40 or maximum aromatic content of 35% volume, for units D-21, D-22, and D-23.

   - Biodiesel (B100) and biodiesel/diesel blends with up to 1% diesel (B99) as alternate fuels for CT-4 and CT-5 were approved by the DOH on December 16, 2013.
3. Fuel use. Refer to the table below.

Maximum Capacity and Fuel Use Per Unit

Unit ID	Manufacturer	Model Number	Serial Number	Capacity (Nominal)	Fuel Flow Rate
D-21	General Motors	20-645F4B	74-B1-1078	2.5 MW	28.1 MMBtu/hr
D-22	General Motors	20-645F4B	66-K1-1062	2.5 MW	28.1 MMBtu/hr
D-23	General Motors	20-645E4	69-H1-1057	2.5 MW	28.1 MMBtu/hr
BS-1	Caterpillar	3412	81Z07275	500 kW	5.57 MMBtu/hr
CT-4	General Electric	LM2500	481-688	20 MW	275 MMBtu/hr
CT-5	General Electric	LM2500	481-692	20 MW	275 MMBtu/hr
ST-7				16 MW	NA
CT-2	Jupiter	GT-35	JF88702	18 MW	198 MMBtu/hr

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Keahole equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

Several types of alternative operating scenarios apply to the generating station as described below:

a. Use of a temporary replacement unit in the event of a failure or major overhaul of an installed unit. In the event that the projected down time of the unit increases the likelihood of an interruption in electrical service, the down unit would be replaced with an equivalent unit. Emissions from the replacement unit will comply with the original unit's permitted emission limits.

b. CT-4 and CT-5 may operate below 25% of peak load during testing of the heat recovery steam generators and steam turbine and steam blows needed to clean the steam tubes prior to initial operation.

c. Should less expensive fuels become available, or the supply of No. 2 diesel become limited, Hawai'i Electric Light may use alternative fuels with prior approval from the Department of Health.

d. In the event of emergency load conditions such as the sudden loss of a unit, CT-2, CT-4 and CT-5 may operate up to 110 percent of peak load for up to 30 minutes. Such operation will not exceed the permitted 3-hour average emission rates.

e. Fuel additives to reduce corrosion, control biological growth, and enhance combustion may be used in CT-4 and CT-5.

f. Hawai'i Electric Light, with the approval from the Department of Health, may use alternate means and methods to improve combustion and/or reduce emissions for CT-4 and CT-5.

g. Hawai'i Electric Light requested to operate the combustion turbine generators, CT-2, CT-4 and CT-5, below minimum load with water injection to address system disturbances and frequency issues in a minor modification application dated 12/10/2015.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Fuel injection timing retard (FITR) is used on D-21, D-22, and D-23 to control NO_x emissions. When CT-4 and CT-5 are operating in combined cycle mode at loads less than 50% of peak load and simple cycle mode, water injection is used on CT-4 and CT-5 to reduce NO_x emissions to 42 ppmvd at 15 percent O_2, with a fuel-bound nitrogen content of 0.0015 percent of less. When CT-4 and CT-5 are operating in combined cycle mode at 50% or more of peak load, water injection in combination with selective catalytic reduction (SCR) is used to reduce NO_x emissions to 15 ppmvd at 15 percent O_2, with a fuel-bound nitrogen content of 0.015 percent or less. The design of the SCR system will limit ammonia slip to 10 ppmvd at 15 percent O_2. Water injection is used on CT-2 reduce NO_x emissions to 47 ppmvd at 15 percent O_2, with a fuel-bound nitrogen content of 0.015 percent or less. SO_2 emissions are controlled by limiting the fuel sulfur content to 0.4 percent by weight for CT-4, CT-5, and BS-1 and 0.0015 percent by weight for D-21, D-22, and D-23. Emissions of PM, PM_{10}, CO, and VOC are controlled by combustion design and good combustion practices. CO emissions for D-21, D-22, and D-23 will be controlled by a DOC. The DOC will reduce CO emissions by at least 70 percent or limit CO to 23 ppmvd at 15% O_2. Emissions of hazardous air pollutants are controlled by the use of No. 2 fuel oil and combustion system design. Refer to Attachment S-1d for emission rate calculations.

Compliance monitoring devices and activities are discussed in Form C-2.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. The planned operation of units D-22, D-23, CT-4, and CT-5 is up to 24 hours per day, seven days per week. Units BS-1 and unit D-21 are operated as needed. Depending on future dispatch requirements, the plant may cycle off-line daily, or operate at reduced loads. While expected operating levels are less than continuous, there may be times when the units must be run continuously for extended periods of time. Fuel consumption is limited on a rolling 12-month basis to 12,301,254 gallons (292,887 barrels) for CT-2.
2. Total hours per year. Units D-22, D-23, CT-4, and CT-5 will operate 8760 hours per year. Fuel consumption is limited on a rolling 12-month basis to 70,000 gallons in D-21. Operation of BS-1 is limited to 300 hours on a rolling 12-month basis. Fuel consumption is limited on a rolling 12-month basis to 12,301,254 gallons (292,887 barrels) for CT-2.
3. If operation is seasonal or irregular, describe. Refer to D.1 and 2 above.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

Hawai'i Electric Light requests incorporation of the Greenhouse Gas Emissions Limitations into the Keahole Covered Source Permit CSP No. 0007-01-C consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations

and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. **After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.**

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Puna Generating Station
CSP No. 0235-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type. CT-3 and PBSG1 burn No. 2 diesel fuel with a 0.4% maximum sulfur content. The boiler burns No. 2 and No. 6 fuel oil with a 2.0% maximum sulfur content. In addition the boiler burns a maximum of 200,000 gal/yr of specification used oil. On November 22, 2017, the DOH approved consumption of specification used oil from Hawaii Petroleum.
3. Fuel use. Refer to the table below.

Maximum Design Fuel Use per Unit

Unit ID	Nominal Capacity	Heat Input (MMBtu/hr)
Boiler	15.5 MW	249
CT-3	20 MW	275
PBSG1	600 kW	6.34

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Puna's equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

Several types of alternative operating scenarios apply to the plant. The first includes the use of a temporary replacement unit in the event of a failure or major overhaul of CT-3 or the boiler. In the event that the projected downtime increases the likelihood of an interruption in electrical service, CT-3 or the boiler would be temporarily replaced. Emissions from the replacement unit will comply with the original unit's operating restrictions and emission limits.

The second alternative operating scenario is unit operation during start-up, shut-down, maintenance, and testing of all units. Boiler start-up operations may range up to 8 hours. Maintenance activities include soot blowing. The time period of this maintenance operation

will not exceed 1-hour in duration two times per day. These maintenance activities are required to maximize generation efficiency and minimize fuel usage.

A third alternate scenario is the ability to switch fuels. Should cheaper fuels become available, or the supply of No. 2 or No. 6 fuel oil becomes limited, Hawai'i Electric Light proposes an alternate scenario that would allow the fuel switch provided that all emission limits and regulatory requirements are met.

A fourth alternative scenario occurs during emergency load conditions. Certain equipment malfunctions (such as sudden loss of a unit) may necessitate the operation of CT-3 at loads as high as 110% of peak load. The time period of this operation will be limited to no more than 30 minutes in duration. This operation will not result in a 3-hr average emission rate that exceeds the maximum emission limits.

A fifth alternative scenario occurs during unpredictable periods of equipment failure, upsets, or emergency conditions. During any emergency condition, Hawai'i Electric Light will operate the subject equipment in such a manner as to minimize emissions. Hawai'i Electric Light will comply with the Emergency Provisions (§11-60.1-16.5).

A sixth alternative scenario involves the burning of a maximum total of 200,000 gal/yr, 90 gal/hr, of specification (spec) used oil. The spec used oil consists of collected used oil, such as waste oil, lubricating oil, and waste diesel oil, crankcase oil, transformer oil (dielectric fluid), solvents and kerosene obtained from the equipment operating at the Hawai'i Electric Light facilities.

A seventh alternative scenario involves the use of fuel additives to reduce corrosion, control biological growth, enhance combustion, or other reasons. Additives used during this scenario shall not affect emission estimates.

Hawai'i Electric Light requested to operate the CT-3 below minimum load to address system disturbances and frequency issues in a minor modification application dated October 16, 2015.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Water injection is used on CT-3 to reduce NO_x emissions to 42 ppmv at 15 percent O_2, dry with a fuel-bound nitrogen content of 0.015 percent or less. Fuel sulfur content is limited to 0.4 percent by weight for CT-3 and PBSG1 and 2.0% by weight for the boiler. Emissions of PM, PM_{10}, CO, and VOC are controlled by combustion design and good combustion practices. Emissions of any hazardous air pollutants are controlled by the use of No. 2 fuel oil for CT-3 and PBSG1, by the use of No. 6 fuel oil for the boiler, and combustion system design. Compliance monitoring devices and activities are discussed in form C-2.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. Depending on future power dispatch requirements, some units may cycle off-line daily, or operate at reduced loads. However, there may be times when a unit must be run continuously for extended periods of time. Thus, this application does not propose any annual operating limits. Units PBSG1 is limited to an annual operating hour limit of 300 hours.
2. Total hours per year. Up to 8,760 hours per year each for CT-3 and the boiler. Units PBSG1 is limited to an annual operating hour limit of 300 hours.
3. If operation is seasonal or irregular, describe. Refer to I.C.1 above.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

With this application, Hawai'i Electric Light requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0235-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Kahului Generating Station
CSP No. 0232-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.
   - No. 6 fuel oil with 2.0% (max) by weight sulfur content, and in emergencies, No. 2 fuel oil with 0.5% (max) sulfur by weight.
   - No more than 300,000 gal/yr of specification (spec) used oil. On December 13, 2017, the DOH approved consumption of specification used oil from Maui Petroleum.
3. Fuel use. Refer to the table below.

Maximum Capacity and Fuel Use Per Unit

Unit ID	Manufacturer	Model Number	Serial Number	Capacity (Nominal)	Fuel Flow Rate	Ignition Fuel
K-1	Combustion Engineering	None	13413	5.0 MW	94.0 MMBtu/hr	Electric
K-2	Combustion Engineering	None	15345	5.0 MW	94.0 MMBtu/hr	Propane
K-3	Combustion Engineering	None	17343	11.5 MW	172.0 MMBtu/hr	Propane
K-4	Babcock & Wilcox	None	PFI3030	12.5 MW	181.0 MMBtu/hr	Propane

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Kahului equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

Several types of alternative operating scenarios apply to the plant. The first alternative operating scenario is unit operation during start-up, shut-down, maintenance, and testing. Boiler start-up operations may occur up to 225 times per year per boiler and occasionally range up to 6 hours.

A second alternate scenario is the ability to switch fuels. Should cheaper fuels become available or the supply of No. 6 fuel oil become limited, MECO may propose an alternate scenario that would allow the fuel switch, provided that all emission limits and regulatory requirements of the DOH rules are met.

A third alternative scenario involves boiler soot-blowing. This is a necessary maintenance operation and may result in a temporary increase in opacity.

A fourth alternative scenario is the use of fuel additives and other products which may be used to control algae, inhibit corrosion, enhance combustion, etc. Emissions during this scenario will comply with all permit conditions.

No additional changes to operating scenarios are proposed with this application

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Sulfur emissions are controlled by limiting the fuel sulfur content to 2 percent for No. 6 fuel oil and 0.5 percent for No. 2 fuel oil. Emissions of NO_x, PM, PM_{10}, CO, and VOC are controlled by combustion design and good combustion practices. Emissions of any hazardous air pollutants are controlled by the use of No. 6 fuel oil or No. 2 fuel oil and combustion system design.

   Compliance monitoring devices and activities are discussed in Form C-2.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. The planned operation of units K-1 through K-4 is 24 hours per day, seven days per week. Depending on future dispatch requirements, the plant may cycle off-line daily, or operate at reduced loads. While these expected operating levels are less than continuous, there may be times when the units must be run continuously for extended periods of time.
2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Operation is not seasonal or irregular.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

With this application, Maui Electric requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0232-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. **An application shall be determined to be complete only when all of the following have been complied with:**

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. **The Director shall not continue to act upon or consider an incomplete application.**

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. **After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.**

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Maalaea Generating Station
CSP No. 0067-01-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.
   - Fuel oil No. 2 diesel with 0.4% maximum sulfur content and biodiesel.
   - Spec used oil (not to exceed 150,000 gal/yr).
   - Fuel oil No. 2 with a maximum sulfur content of 0.0015 percent by weight and a minimum Cetane index of 40 or a maximum aromatic content of 35 volume percent.
3. Fuel use. Refer to the table below.

Maximum Design Fuel Use per Unit

Unit ID	Make	Model Number	Unit Type	Nominal Output	Nominal Heat Input
M1-M3	General Motors	20-645E4	Diesel Engine	2.5 MW	29.2 MMBtu/hr
M4 & M6	Cooper Bessemer	LSV-20-T	Diesel Engine	5.6 MW	58.8 MMBtu/hr
M5 & M7	Cooper Bessemer	LSV-20-T	Diesel Engine	5.6 MW	58.8 MMBtu/hr
M8-M9	Colt Industries	C-P PC2V	Diesel Engine	5.6 MW	60.2 MMBtu/hr
M10-M13	Mitsubishi Hvy. Ind.	185V52/55A	Diesel Engine	12.5 MW	122.7 MMBtu/hr
X1-X2	General Motors	20-645E4	Diesel Engine	2.5 MW	28.5 MMBtu/hr
SG1	General Motors / Detroit	12V92TAB/8 123-7416	Diesel Engine	600 kW	6.34 MMBtu/hr
M14 & M16	General Electric	LM2500	Combustion Turbine	20 MW	275 MMBtu/hr
M17 & M19	General Electric	LM2500	Combustion Turbine	20 MW	275 MMBtu/hr

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Maalaea equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation (SIC code 4911) is the only product or process.

Several types of alternative operating scenarios apply to the plant. The first alternative operating scenario is the ability to conduct steam blows activity.

The second alternative operating scenario includes the use of a temporary replacement unit for the diesel engine generators and combustion turbines, in the event of a failure or major overhaul of an installed unit. In the event that the projected down-time of the installed unit increases the likelihood of an interruption in electrical service, the installed unit would be temporarily replaced. Emissions from the temporary replacement unit will comply with the original unit's emission and operating limits.

A third alternative scenario is the ability to operate below the 25% load for maintenance and testing, provided that all emission limits and regulatory requirements of the DOH rules are met.

A fourth alternative scenario is the ability to burn alternative fuels. Should cheaper fuels become available or the supply of No. 6 fuel oil become limited, Maui Electric proposes an alternate scenario that would allow the fuel switch, provided that all emission limits and regulatory requirements of the DOH rules are met.

A fifth alternative operating scenario is the use of fuel additives and other products which may be used to control algae, inhibit corrosion, enhance combustion, etc. Emissions during this scenario will comply with all permit conditions.

A sixth alternative operating scenario is the ability to operate the combustion turbines up to 110% above peak load if equipment malfunction such as a sudden loss of a unit occurs, provided conditions specified in CSP No. 0067-01-C are met.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   Fuel Injection Timing Retard (FITR) is used on diesel engine generating units M12, M13, X1, and X2 to control NOx emissions. Water injection is used on M14, M16, M17, and M19 to limit NOx emissions to 42 ppmvd at 15 percent O_2, dry with a fuel-bound nitrogen content of 0.015 percent by weight or less. Sulfur emissions are controlled by limiting the fuel sulfur content to 0.4 percent for units M4 through M13, M14, M16, M17, and M19 and 0.0015% for units M1 through M3, X1, and X2. CO emissions from units M1 through M13, X1, and X2 are controlled by the Diesel Oxidation Catalyst (DOC). The DOC will reduce CO emissions by at least 70 percent or limit CO emissions to 23 ppmvd or less at 15 percent O_2. Emissions of PM, PM10, CO and VOC are controlled by combustion design and good combustion practices. Emissions of hazardous air pollutants are controlled by the use of No. 2 fuel oil and combustion system design.

   Compliance monitoring devices and activities are discussed in Form C-2.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. Total hours per day, per week, and/or per month. The planned operation is full load the majority of the time. Depending on future dispatch requirements, the plant may cycle off-line daily, or operate at reduced loads. While these expected operating levels are less than continuous, there may be times when the units must be run continuously for extended periods of time.
2. Total hours per year. Up to 8,760 hours per year. Units X1 and X2 are limited by PSD Permit HI 86-02 to 4,380 hours per year, per unit. Unit SG1 is limited by PSD Permit HI 90-02 to 300 hours per year.
3. If operation is seasonal or irregular, describe. Operation is not seasonal or irregular.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

See item I.B.1. above for current work practices that affect emissions of any regulated or hazardous air pollutant.

Maui Electric requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0067-01-C, consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. Provide other information as follows:

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. The Director reserves the right to request the following information:

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. An application shall be determined to be complete only when all of the following have been complied with:

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. The Director shall not continue to act upon or consider an incomplete application.

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. **After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.**

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**

Revised Form S-6
Palaau Generating Station
CSP No. 0031-04-C
July 2019

File No.: _____

S-6: Application for a Significant Modification to a Covered Source

In providing the required information, reference the corresponding letters and numbers listed below.

Provide a minimum of **two (2)** sets (1 original and 1 copy) of all application materials to the Hawaii Department of Health. Also, mail **one (1)** set directly to EPA at the following address:

Chief (Attention: AIR-3)
Permits Office, Air Division
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

I. In accordance with Hawaii Administrative Rules (HAR) §11-60.1-104, the following information is required:

A. Equipment Specifications:

1. Maximum design capacity. Refer to the table below.
2. Fuel type.

   - No. 2 fuel oil with maximum sulfur content of 0.4 percent by weight for CT1.

   - No. 2 diesel with maximum 0.0015 percent by weight sulfur content, minimum Cetane index of 40 or maximum aromatic content of 35% volume for Units CAT1 and CAT2, CUM3 through CUM6, CAT7 through CAT9.

   - Specification used oil for Units CUM3 through CUM6 and CAT7 through CAT9.
3. Fuel use.

   - The total combined fuel consumption of CUM3-CUM6 shall not exceed 1,650,000 gallons in any rolling twelve-month (12-month) period.

   - The total combined specification used oil consumption of CUM3-CUM6 and CAT7-CAT9 shall not exceed 10,000 gallons in any rolling twelve-month (12-month) period.

   - The total fuel consumption of CT1 shall not exceed 1,230,000 gallons in any rolling twelve-month (12-month) period.

Maximum Design Fuel Use per Unit

Unit ID	Make	Model Number	Unit Type	Nominal Rating (MW)	Nominal Heat Input (MMBtu/hr)	Fuel (gal/hr)
CUM3, CUM4, or CUM6	Cummins	KTA50	Diesel Engine	1.0	9.09	64.9
CUM5	Cummins	KTTA50	Diesel Engine	1.0	9.52	68.0
CAT7, CAT8, or CAT9	Caterpillar	3608	Diesel Engine	2.2	23.38	167.0
CAT1 or CAT2	Caterpillar	3516	Diesel Engine	1.25	12.62	90.63
CT1	Solar International	Centaur T4001	Combustion Turbine	2.0	34.0	240.0

4. Production capacity. Does not apply.
5. Production rates. Does not apply.
6. Raw materials. Does not apply.
7. Provide any manufacturer's literature. This application does not change any of Palaau equipment's manufacturer's specifications.

B. Provide detailed descriptions of all processes and products defined by Standard Industrial Classification Code (SICC). Also, provide any reasonably anticipated alternative operating scenarios, associated processes, and products, by SICC.

Electrical power generation through combustion of fossil fuels (SICC 4911) is the only product or process.

Several types of alternative operating scenarios apply to the plant. A first alternate scenario includes the use of a temporary replacement unit in the event of a failure or major overhaul of an installed unit, provided the requirements in Attachment IIA Section C.7.a are met.

A second alternative scenario is the ability to switch fuels. Should cheaper fuels become available, Maui Electric may propose an alternate scenario that would allow the fuel switch, provided that all emission limits and regulatory requirements of the DOH rules are met.

No additional changes to operating scenarios are proposed with this application.

1. Identify and describe in detail all air pollution control equipment and compliance monitoring devices or activities planned by the owner or operator, and to the extent of available information, an estimate of emissions before and after controls. Provide all calculations and assumptions.

   NO_X emissions from Units CUM3 through CUM6, CAT1, and CAT2 are controlled by fuel injection timing retard (FITR). NO_X emissions from Units CAT7 through CAT9 are controlled by FITR and intake air cooling. Emissions of PM/PM_{10}, CO, and VOC are controlled by combustion design. SO_2 emissions are controlled by limiting the fuel sulfur content to 0.4 percent by weight for Unit CT1 and 0.0015 percent by weight for units CUM3 through CUM6, CAT7 through CAT9, CAT1, and CAT2. CO emissions will be controlled by the DOC for units CUM3 through CUM6, CAT7 through CAT9, CAT1, and CAT2. The DOC will reduce CO emissions by at least 70 percent or limit CO to 23 ppmvd at 15% O_2. Emissions of any hazardous pollutants are controlled by the use of No. 2 fuel oil and combustion system design.

2. List all ***new insignificant*** activities in accordance with §11-60.1-82.

   No additional changes/additions to insignificant activities are proposed with this application.

C. Maximum Operating Schedule (to the extent needed to determine or regulate emissions):

1. 1. Total hours per day, per week, and/or per month. The planned operation of the facility is 24 hours per day, seven days per week. Depending on future dispatch requirements, the plant may cycle off-line daily, or operate at reduced loads. While these expected operating levels are less than continuous, there may be times when the units must be run continuously for extended periods of time. Thus, this application does not propose any annual operating limits.

2. Total hours per year. Up to 8,760 hours per year.
3. If operation is seasonal or irregular, describe. Refer to I.C.1 above.

D. Cite and describe all applicable requirements as defined in HAR §11-60.1-81, including the following:

1. Description of or reference to any applicable test methods for determining compliance with each applicable requirement. See Form C-2.
2. Explanation of all proposed exemptions from any applicable requirements. See Forms C-1 and C-2.

E. Identify and describe current operational limitations or work practices the source plans to implement that affect emissions of any regulated or hazardous air pollutant. Provide all calculations and assumptions.

Pollution controls include a fuel sulfur content limit, good combustion practices, and FITR.

Maui Electric requests incorporation of the Greenhouse Gas Emissions Limitations into the Covered Source Permit CSP No. 0031-04-C consistent with the Greenhouse Gas Emissions Reduction Plan submitted to the DOH on February 28, 2018, the subsequent updates submitted to the DOH on October 17, 2018 and May 15, 2019, and the latest update dated July 26, 2019, enclosed with this application.

F. Provide a detailed schedule for construction or modification of the proposed source, including any major milestones, if applicable. Not applicable.

G. Provide detailed information to define permit terms and conditions for any proposed ***emissions trading*** within the facility in accordance with HAR §11-60.1-96. No emissions trading is proposed.

H. For ***significant*** modifications which increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted, an assessment of the ambient air quality impact of the covered source or significant modification, with the inclusion of any available background air quality data. The assessment shall include all supporting data, calculations and assumptions, and a comparison with the National Ambient Air Quality Standards and State Ambient Air Quality Standards. Do not apply. The proposed modification will not increase the emissions of any air pollutant or result in the emission of any air pollutant not previously emitted.

I. For ***new*** covered sources or ***significant*** modifications subject to the requirements of subchapter 7 of HAR Chapter 11-60.1, all analyses, assessments, monitoring, and other application requirements of subchapter 7. Do not apply. The proposed modification is not subject to Subchapter 7 of HAR Chapter 11-60.1.

J. Provide the following for Compliance purposes:

1. A compliance plan, Form C-1.
2. A compliance certification, Form C-2.

II. Submit an application fee according to the Application Fees Schedule in the Instructions for Applying for an Air Pollution Control Permit.

III. **Provide other information as follows:**

A. As required by any applicable requirement or as requested and deemed necessary by the director to make a decision on the application.

B. As may be necessary to implement and enforce other applicable requirements of the Clean Air Act or of HAR Chapter 11-60.1 or to determine the applicability of such requirements.

IV. **The Director reserves the right to request the following information:**

A. A risk assessment of the air quality related impacts caused by the covered source or significant modification to the surrounding environment.

B. Results of source emissions testing, ambient air quality monitoring, or both.

C. Information on other available control technologies.

V. **An application shall be determined to be complete only when all of the following have been complied with:**

A. All information required or requested in numbers **I, III, and IV** has been submitted.

B. All documents requiring certification have been certified pursuant to HAR §11-60.1-4.

C. All applicable fees have been submitted.

D. The director has certified that the application is complete.

VI. **The Director shall not continue to act upon or consider an incomplete application.**

A. The applicant shall be notified in writing whether the application is complete:

1. For the requirements of subchapter 7, thirty days after receipt of the application.
2. For the requirements of HAR subchapter 5, sixty days after receipt of the application. For purposes of this paragraph, the date of receipt of an application for a new covered source or significant modification subject to the requirements of subchapter 7 shall be the date the application is determined to be complete for the requirements of subchapter 7.
3. Unless the Director requests additional information or notifies the applicant of incompleteness within sixty days after receipt of an application pursuant to **VI.A.2** above, the application shall be deemed complete for the requirements of subchapter 5.

B. During the processing of an application that has been determined or deemed complete, if additional information is necessary to evaluate or take final action on the application, the Director may request such information in writing and set a reasonable deadline for a response.

VII. **After receipt of a complete application, the Director, in writing, shall approve, conditionally approve, or deny an application within eighteen months, except as provided in HAR §11-60.1-88 and (A) and (B) below.**

A. Upon program approval, within nine months for an application containing an early reduction demonstration pursuant to section 112(i)(5) of the Clean Air Act.

B. Within twelve months for a new covered source or significant modification subject to the requirements of subchapter 7.

VIII. **The Director shall provide reasonable procedures and resources to complete the review of the majority of the applications for a significant modification within nine months after receipt of a complete application. An application for significant modification shall be approved only if the Director determines that the significant modification will be in compliance with all applicable requirements.**

IX. **The Director shall provide for public notice, including the method by which a public hearing can be requested, and an opportunity for public comment on the draft significant modification to the covered source in accordance with HAR §11-60.1-99.**

X. **The Director shall provide a statement that sets forth the legal and factual bases for the draft permit conditions (including references to the applicable statutory or regulatory provisions) to EPA and any other person requesting it.**

XI. **Each application for a significant modification, and the proposed Covered Source Permit reflecting the significant modification shall be subject to EPA oversight in accordance with HAR §11-60.1-95.**