

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF HAWAII

FILED

2016 JUL 22 P 4: 01

In the Matter of the Application of )  
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 THE STATE OF HAWAII )  
 DEPARTMENT OF BUSINESS, )  
 ECONOMIC DEVELOPMENT, )  
 AND TOURISM )  
 )  
 For an Order Approving the Green )  
 Infrastructure Loan Program. )  
 )

Docket No. 2014-0135

PUBLIC UTILITIES  
COMMISSION

**PROGRAM NOTIFICATION No. 7 FOR  
THE GREEN INFRASTRUCTURE LOAN PROGRAM,  
ATTACHMENTS A AND B  
AND  
CERTIFICATE OF SERVICE**

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**PROGRAM NOTIFICATION No. 7 FOR  
THE GREEN INFRASTRUCTURE LOAN PROGRAM**

TO THE HONORABLE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF HAWAII:

The Hawaii Green Infrastructure Authority (“HGIA” or “Authority”) of the State of Hawaii<sup>1</sup> submits this Program Notification through its Deputy Attorney General.

**I. Background**

Decision and Order No. 32318, filed on September 30, 2014 in Docket No. 2014-0135 (the “Program Order”) approved the “Application of the Department of Business, Economic Development, and Tourism for an Order Approving the Green Infrastructure Loan Program,” filed on June 6, 2014 (“Application”) for the use of funds deposited in the Green Infrastructure Special Fund to establish and institute the Green Infrastructure Loan Program (“GEMS Program”), subject to the modifications described within the Program Order.<sup>2</sup> Within the

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<sup>1</sup> HRS §196-63 provides that until the Authority is duly constituted, the Department of Business, Economic Development, and Tourism of the State of Hawaii (DBEDT) may exercise all powers reserved to the Authority pursuant to HRS §196-64, and shall perform all responsibilities of the Authority. As the Authority has now been duly constituted, the Authority assumes in its own right, pursuant to statute, all of the functions, powers, and obligations, including responsive or informational submissions in this Docket, which had heretofore been assigned to DBEDT.

<sup>2</sup> See “Decision and Order No. 32318,” filed in Docket No. 2014-0135 on September 30, 2014, at p. 1.

Application, a governance process was proposed for the GEMS Program that used mechanisms for updates or modifications to approved GEMS Program guidelines. In this process, Program Notifications are used to provide additional details on GEMS Program components including *project, program, financing, or other arrangements (clean energy technology, parties intended to benefit, loan program or other arrangements, and credit sources and funding); minimum lending, credit or investing criteria; and repayment mechanisms and processes.*<sup>3</sup> The Application stated that DBEDT or the Authority<sup>4</sup> will use Program Notifications to report and certify information on implementation of key GEMS Program components that are within the scope of the Program Order parameters and exhibits issued by the Public Utilities Commission (“Commission”).<sup>5</sup>

The Program Order approved the Program Notification process with a modification requiring that the Authority file any GEMS Program Notification with the Commission no less than fifteen (15) business days prior to implementation instead of the proposed ten (10) days stated in the Application.<sup>6</sup>

The Division of Consumer Advocacy (“Consumer Advocate” or “CA”) recommended that DBEDT submit market assessments and cost-benefit analyses for the financing of technologies related to solar PV that will mitigate grid saturation prior to DBEDT’s submission of a Program

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<sup>3</sup> Paraphrased from HRS §269-170 and 269-171, as referenced in “Application of Department of Business, Economic Development, and Tourism: Verification; Exhibits; and Certificate of Service,” filed in Docket No. 2014-0135 on June 6, 2014 at p. 15. Emphasis added.

<sup>4</sup> Prior to the Authority’s establishment, DBEDT is authorized to exercise the Authority’s powers and is required to effectuate the Authority’s responsibilities (see HRS §196-63). Accordingly, references to the “Authority” and “HGIA” in this Program Notification include DBEDT acting on behalf of the Authority, as explained in footnote 1 above.

<sup>5</sup> See “Application of Department of Business, Economic Development, and Tourism; Verification; Exhibits; and Certificate of Service,” filed in Docket No. 2014-0135 on June 6, 2014 at p. 15.

<sup>6</sup> See “Decision and Order No. 32318,” filed in Docket No. 2014-0135 on September 30, 2014, at p. 84.

Notification,<sup>7</sup> and the Commission then directed DBEDT “to provide the information identified by the Consumer Advocate concerning market assessments and cost-benefit analyses for approved non-Solar PV clean energy technology with any Program Notification that is submitted to finance those technologies.”<sup>8</sup>

## **II. Program Notification**

The purpose of this Program Notification is to provide the Commission with additional information regarding the deployment of capital for energy storage systems.<sup>9</sup> These changes are consistent with the Annual Plan submitted to the Commission<sup>10</sup> and Exhibit 9 of the Application as amended in the Annual Plan.<sup>11</sup>

Energy Storage was proposed as an eligible technology in DBEDT’s Statement of Position<sup>12</sup> and approved in the Program Order.<sup>13</sup> The use of GEMS capital for energy storage is consistent with the intent of Act 211 (Session Laws of Hawaii 2013) because energy storage expands access to green infrastructure for all markets, expands the GEMS market portfolio, and furthers the state’s 100% renewable energy goal by 2045.<sup>14</sup> Because energy storage systems create different benefits and incentives for ratepayers compared to traditional PV systems, HGIA is also amending the GEMS “Consumer Loan Product”<sup>15</sup> and “GEMS Program Guidelines.”<sup>16</sup>

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<sup>7</sup> See “Division of Consumer Advocacy’s Statement of Position,” filed in Docket No. 2014-0135 on August 7, 2014, at p. 13.

<sup>8</sup> See “Decision and Order No. 32318,” filed in Docket No. 2014-0135 on September 30, 2014, at p. 85.

<sup>9</sup> See “Attachment A: GEMS Consumer Loan Product.”

<sup>10</sup> See “Annual Plan Fiscal Year 2017: July 1, 2016-June 30, 2017,” filed in Docket No. 2014-0135 on March 31, 2016, herein referred to as “Annual Plan,” at p. 15.

<sup>11</sup> See Annual Plan at Attachment I.

<sup>12</sup> See “The State of Hawaii Department of Business Economic Development and Tourism’s Statement of Position on its Request for a Program Order; and Certificate of Service.” filed in Docket No. 2014-0135 on August 7, 2014, at p. 6.

<sup>13</sup> See “Decision and Order No. 32318,” filed in Docket No. 2014-0135 on September 30, 2014, at Exhibit 9.

<sup>14</sup> See “Decision and Order No. 32318.” filed in Docket No. 2014-0135 on September 30, 2014, at p. 37.

<sup>15</sup> See “Attachment A: GEMS Consumer Loan Product”

<sup>16</sup> See “Attachment B: Exhibit 13: GEMS Program Guidelines, Revised July 22, 2016”

Energy Storage is defined as technology that is capable of absorbing energy, storing it for a period of time, and thereafter dispatching the energy. An “energy storage device” may possess any of the following characteristics:

- Is centralized or distributed.
- Is owned by a load-serving entity or electric utility, a customer of a load-serving entity or electric utility, a third party, or jointly by two or more of the above.
- Is cost effective.
- Reduces emissions of greenhouse gases, reduces demand for peak electrical generation, defers or substitutes for an investment in generation, transmission, or distribution assets, or improves the reliable operation of the electrical transmission or distribution grid.

An “energy storage device” shall do one or more of the following:

- Use mechanical, chemical, or thermal processes to store energy that was generated at one time for use at a later time.
- Store thermal energy for direct use for heating or cooling at a later time in a manner that avoids the need to use electricity at that later time.

To satisfy Commission requirements for the financing of “approved non-Solar PV clean energy technology” stated above, the Authority is providing a market assessment and cost-benefit analysis for energy storage.<sup>17</sup> The market assessment explains how Hawaii’s dynamic and rapidly changing renewable energy landscape necessitates the adoption of energy storage. The cost benefit analysis explains how energy storage provides financial and system reliability benefits for ratepayers and the utility. The Authority also anticipates changes in rate structures, such as time of use (TOU) and demand response (DR), may create a viable market for energy storage independent of PV systems.

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<sup>17</sup> See “Decision and Order No. 32318,” filed in Docket No. 2014-0135 on September 30, 2014, at p. 85.

## A. Market Assessment

Present Market Conditions — On October 12, 2015, the Commission capped Net Metering and replaced the tariff with Customer Grid Supply (CGS) and Customer Self Supply (CSS) tariffs.<sup>18</sup> Under CGS, 35 megawatts of capacity is available to consumers who desire to receive a credit on their electric bill for the electricity exported to the grid from their PV systems. Due to the financial benefits afforded by energy export, nearly all consumers interested in PV elected to participate in the CGS tariff.<sup>19</sup> On June 22, 2016, MECO met its allocated CGS cap and ceased accepting CGS applications. HECO and HELCO are expected to reach their allocated caps by the end of 2016.<sup>20</sup> Once CGS is fully subscribed, ratepayers that wish to pursue the installation of PV on their property must obtain grid interconnection under CSS.

Unlike the preceding NEM and CGS programs, CSS customers may not export any electricity to the grid, and therefore do not realize any financial return from the excess energy a PV system produces.<sup>21</sup> This complicates the traditional value proposition of PV, because according to the Hawaii Energy 2014 Annual Report, most ratepayers consume electricity between five and nine p.m., when solar PV systems provide little to no generation.<sup>22</sup> As this consumption trend is largely driven by traditional business hours, most ratepayers are limited in their ability to shift electricity demand to periods of the day when PV generation is available. Therefore, to create economic value for most ratepayers, PV installations under CSS require a device that stores excess electricity generated during the day, and then discharges the stored electricity in the

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<sup>18</sup> See “Decision and Order No. 33258,” filed in Docket No. 2014-0192 on October 12, 2015, at p. 118, 126.

<sup>19</sup> See HECO Companies’ “Weekly Interconnection Queue,” issued pursuant to PUC “Decision and Order No. 33258,” filed in Docket No. 2014-0192 on October 12, 2015.

<sup>20</sup> See HECO Companies’ “Weekly Interconnection Queue,” issued pursuant to PUC “Decision and Order No. 33258,” filed in Docket No. 2014-0192 on October 12, 2015.

<sup>21</sup> See “Decision and Order No. 33258,” filed in Docket No. 2014-0192 on October 12, 2015, at p. 118, 126.

<sup>22</sup> Annual Report, Program Year 2014, Hawaii Energy, December 11, 2015, p. 25, available at [https://hawaiienergy.com/images/resources/ProgramYear2014\\_AnnualReport.pdf](https://hawaiienergy.com/images/resources/ProgramYear2014_AnnualReport.pdf)

evening. These energy storage devices are now practical for consumers to adopt due to price decreases in battery technology.<sup>23</sup> Anticipated utility rate structures will also compliment the renewable energy market trend towards energy storage.<sup>24</sup> Given that financial institutions are traditionally slow to offer financing for new technologies, there is an opportunity for the GEMS program to supply capital for this inevitable transition towards PV and energy storage.

Additional Market Value of Energy Storage — In addition to providing energy to CSS participants during peak hours of electricity demand, the Commission acknowledges energy storage will provide additional monetary benefits and aid in grid stability. For example, in Order 33258, submitted on October 12, 2015, Docket No. 2014-0192, the Commission stated, “continued innovation in other distributed energy resources, such as electric vehicles and distributed energy storage will...maximize customer benefits.”<sup>25</sup> The Commission also stated in 2014 that, “[Grid modernization efforts] must also utilize new tools, such as energy storage, demand response, and other load management techniques.”<sup>26</sup> “All generation sources, whether utility, IPP, or customer-owned, will contribute to maintaining system stability.”<sup>27</sup>

i. Energy Storage Can Stabilize the Grid Through Demand Response

Demand Response programs will enable energy storage systems to aid in grid stabilization. Under Demand Response, a ratepayer’s energy storage system is commandeered by the utility during periods of peak demand. This lessens the burden on the utility to deliver immediate electricity during severe load spikes and

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<sup>23</sup> International Renewable Agency, *Battery Storage for Renewables: Market Status and Technology Outlook*, January 2015, pg. 7, available at

[http://www.irena.org/DocumentDownloads/Publications/IRENA\\_Battery\\_Storage\\_report\\_2015.pdf](http://www.irena.org/DocumentDownloads/Publications/IRENA_Battery_Storage_report_2015.pdf)

<sup>24</sup> See “Decision and Order No. 33258,” filed in Docket No. 2014-0192 on October 12, 2015. at p. 153.

<sup>25</sup> *Id.* at 7

<sup>26</sup> Hawaii Public Utilities Commission, *Exhibit A: Commission’s Inclinations on the Future of Hawai’i’s Electric Utilities*, at p. 6 (April, 2014), available at <http://puc.hawaii.gov/wp-content/uploads/2014/04/Commissions-Inclinations.pdf>

<sup>27</sup> *Id.* at 7

ameliorates possible blackouts that might otherwise occur.<sup>28</sup> In return, ratepayers receive credits or savings from the utility.

ii. Energy Storage Can Facilitate Time of Use Rates

Energy storage will also aid in grid stabilization efforts when the Commission initiates TOU rates.<sup>29</sup> In offering different rates based on when electricity is consumed during the day, a TOU tariff can greatly increase the financial and practical viability of energy storage systems. The utility likewise benefits because energy is stored and consumed during periods that correlate with the utility's electric delivery demand schedule. TOU and DR incentives would also encourage customers to stay grid-connected to the utility. Without these incentives, customers may elect to entirely disengage from the grid to the detriment of all ratepayers as PV and energy storage prices fall. Thus, through financing energy storage, HGIA enables the ratepayer continued access to renewable resources in a manner that is cost effective, expands the GEMS portfolio, furthers the state's 100% RPS goal, and aids underserved markets.

## B. Cost-Benefit Analysis

The Authority requires that borrowers or participants receive monetary benefits from HGIA-funded energy storage systems. To ensure compliance, HGIA will only finance projects that demonstrate bill savings over the expected life of the equipment. Thus, borrowers must receive an expected overall reduction in their energy bill. Actual savings metrics will be reported as part of the GEMS Program Metrics.

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<sup>28</sup> See Annual Report, Program Year 2014, Hawaii Energy, December 11, 2015, p. 23, available at [https://hawaiienergy.com/images/resources/ProgramYear2014\\_AnnualReport.pdf](https://hawaiienergy.com/images/resources/ProgramYear2014_AnnualReport.pdf)

<sup>29</sup> See "Decision and Order No. 33258," filed in Docket No. 2014-0135 on October 12, 2015, at p. 153.



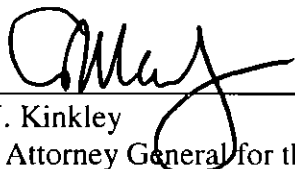
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Unlike PV generated savings under NEM or CGS, the amount of savings afforded by energy storage is highly dependent upon individual ratepayer consumption of energy, and the time of day that energy is consumed.<sup>30</sup> Capturing and storing solar energy for evening use increases the financial benefits under CSS for ratepayers across socio-economic strata, including the underserved in today's market conditions. The deployment of TOU and DR is expected to further improve the economics of financing energy storage for all ratepayers in Hawaii. As energy storage and PV related technologies are expected to dramatically decrease in price over the next five years, HGIA anticipates that the benefits of energy storage will transform Hawaii's green infrastructure throughout the next decade.<sup>31</sup>

### III. Subsequent Authority Action

Unless informed otherwise by the Commission, upon completion of the fifteen (15) business-day-term of Program Notification, HGIA may implement the deployment of capital to finance energy storage across the suite of current or future GEMS loan products. Any subsequent changes to the details described herein will be proposed through the GEMS Annual Plan.

Submitted this 22<sup>nd</sup> day of July, 2016, in Honolulu, Hawaii.

  
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Gregg J. Kinkley  
Deputy Attorney General for the Authority

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<sup>30</sup> International Renewable Agency. *Battery Storage for Renewables: Market Status and Technology Outlook*. January 2015, pg. 7, available at [http://www.irena.org/DocumentDownloads/Publications/IRENA\\_Battery\\_Storage\\_report\\_2015.pdf](http://www.irena.org/DocumentDownloads/Publications/IRENA_Battery_Storage_report_2015.pdf)

<sup>31</sup> *Id.* at 30



# GEMS Financing Program

## ATTACHMENT A: CONSUMER LOAN PRODUCT

**Objective** To expand access to affordable renewable energy systems for consumers.

### PRODUCT DESCRIPTION

**Eligible Technology** Solar PV systems, energy storage, advanced inverters, smart modules, monitoring devices, and other technologies and physical infrastructure to support renewable energy systems.

**Allowable Uses** Financing is available for up to 100% of the cost of the renewable energy system, including the financing of purchases, prepaid leases or prepaid power purchase agreements.

Other financeable cost may include: financing cost; required electrical upgrades to conform to building permits; electrical permits; fees related to HECO approval; and other hard cost and structural improvements.

**Term** Up to twenty (20) years.

**Down Payment** Not required.

**Eligible Installers** The GEMS Program, and/or its designee will maintain a list of eligible installers. The borrower must use one of the installers on the approved list.

**Interest Rate** Not to exceed 9.999%.

**Loan Amount** Loan amount restrictions, when applicable.

**Eligible Borrowers** Residential property owners in the State of Hawaii served by the Hawaiian Electric Company or its affiliates (collectively referred to as HECO or the Utility Company).

**Eligible Properties** Fee simple or leasehold properties. Leasehold restrictions may apply.

**Credit Criteria** The following credit assessments may apply: consumer credit score(s) assessment; credit report assessment; utility bill assessment; and/or employment assessment.

**Utility Bill Savings** Utility bill savings required. Savings dependent on system specification, loan qualification, storage, on-bill, and other factors.

**Equipment** Equipment requirements must meet minimum standards as defined by the GEMS Program and/or its designee.

**System Sizing** System sizing restrictions may apply, based on past usage.

### REPAYMENT MECHANISM

**On-Bill Repayment** On-bill repayment may be offered, if available.

**Direct Bill Payment** Loan repayments will be directed to the GEMS loan servicer. ACH repayment may be offered.

**Confidential Information Deleted Pursuant to  
Protective Order No. 32142**

**ATTACHMENT B: EXHIBIT 13—AMENDED: GEMS PROGRAM GUIDELINES  
[REDACTED]**

## CERTIFICATE OF SERVICE

I hereby certify that I have this date, in addition to filing an original and three copies with the Commission, served one (1) or two (2) copies of the foregoing GEMS Program Notification, together with this Certificate of Service, by making personal service (P) or service by electronic mail (M), to the following and at the following addresses:

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Department of Budget and Finance  
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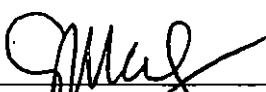
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Dated: Honolulu, Hawaii, July 22, 2016.

HAWAII GREEN INFRASTRUCTURE  
AUTHORITY

  
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