



**State of Hawaii  
Department of Business, Economic Development & Tourism  
Hawaii Green Infrastructure Authority**

**STATUS OF THE ACTIVITIES OF THE  
HAWAII GREEN INFRASTRUCTURE AUTHORITY**

**REPORT TO THE  
GOVERNOR AND THE LEGISLATURE  
OF THE  
STATE OF HAWAII**

**Pursuant to**

**Act 211, Session Laws of Hawaii 2013**

**December 2016**

**Prepared by the  
State of Hawaii  
Hawaii Green Infrastructure Authority**

**December 2016**

## **EXECUTIVE SUMMARY**

**Purpose.** Now entering its third year, the Hawaii Green Infrastructure Authority (“HGIA” or “Authority”) was created by the Legislature to make renewable energy investments accessible and affordable to Hawaii’s consumers, with a portion of its funds to benefit underserved communities, low- and moderate-income homeowners, renters, and non-profits. HGIA, through the GEMS program, was capitalized through an innovative market-driven financing mechanism to improve access to renewable energy infrastructure and thus advance the State’s goal of achieving 100% renewable portfolio standard in the electricity sector by 2045.

**Challenges.** Not unexpectedly, the complex and innovative nature of the financing products required to implement and roll-out the GEMS program has required a vigorous effort over the past three years since passage of the enabling legislation. While the Authority has executed on the original legislative intent, GEMS was designed, in large part, to address the market access challenges prevailing in 2012-2013.

As the program infrastructure and financing products were being established in 2014-2015, external factors drove significant changes in the Hawaii marketplace. Grid saturation, the rise of aggressive private-sector financing for residential solar, and subsequently the end of net energy metering have, in substantial and unanticipated ways, changed the nature of access challenges in the marketplace.

Additionally, the unanticipated loss of GEMS’ tax equity partner for its Nonprofit and Small Business Loan Products resulted in the termination of these programs on December 31, 2015, just nine short months after its launch. Consequently, just as HGIA was funding its first consumer loan in January 2016, the low consumer adoption, due to its then uncompetitive and cumbersome residential loan product, coupled with the termination of its nonprofit/small business products severely negatively impacted the Authority’s ability to meet initial funding expectations set in 2013.

**Progress.** However, 2016 was a pivotal year for GEMS as the program finally started funding loans in January, more than thirteen (13) months since bond issuance and three (3) years since the passing of Act 211. Further, the Authority continued to gain momentum through the end of the 2016 calendar year and expects to end fiscal 2017 with some \$15.0 million in loans funded and/or committed.

**Opportunities.** With the implementation of HGIA’s On-Bill Repayment mechanism imminent, after the Hawaii Public Utilities Commission (“Commission” or “PUC”) and key stakeholders devoted considerable time and resources to set the foundation and complete its framework over the last five years in Docket No. 2014-0129, the Authority is eager to leverage this mechanism to democratize clean energy by expanding access and affordability of renewable energy and energy efficiency projects for renters and low and moderate-income homeowners, as was the original intent of the legislation.

**Need for Change.** Dynamic changes in the global, national, and Hawaii energy markets will continue to evolve and significantly alter the landscape for infrastructure financing in the near and long-term future. As such, the models and programs originally contemplated in the initial Program Order to the Commission are no longer sufficient to achieve the projected GEMS program impact. With thoughtful and purposeful governance modifications, GEMS has the potential to play a critical role in Hawaii to foster innovative new technologies and financing models that may not yet be supported by the conventional financing market.

**Docket Process Not Nimble Enough for Lending Program.** While part of GEMS' deployment challenges have been due to external changes, a significant impediment hindering the Authority's ability to react in a nimble and timely manner to market changes and demands, is its lengthy, expensive and burdensome approval process, which has resulted in missed market opportunities for PV and non-PV related projects.

Currently, governance over any new lending activity requires a two-step approval process. First, through an inefficient and time consuming docket process, communicating to the decision-maker via the filing of static documents (i.e. Program Notifications, Program Modifications, etc.), comments and rebuttals or clarifications, which does not allow for time sensitive, engaging or meaningful discussions during the decision making process.

**Board Needs More Energy Stakeholders.** Secondly, execution is further delayed with the requirement of obtaining Board approval following Commission approval. Changing the composition of the board to include more energy stakeholders would enable the Authority to react more quickly to market changes and deploy capital for green infrastructure investments in a timely manner to help meet the state's clean energy goals and objectives.

**Capital for Energy Innovation.** GEMS funding is uniquely positioned to have significant, positive impact in the coming years. As a market-based program, it is critical for GEMS to remain flexible and open to innovation in a rapidly moving sector of the market, which requires the full empowerment and decision making authority of HGIA's Board. We remain confident that the program can be instrumental in achieving the State's energy sustainability.

## **REPORT**

### **Reporting Pursuant to Act 211, Session Laws of Hawaii 2013**

This report fulfills the statutory requirement to report on the status of the Authority's activities, including approved loan program description and uses; summary information and analytical data concerning the implementation of the loan program; summary information and analytical data concerning the deployment of clean energy technology, demand response technology, and energy use reduction and demand-side management infrastructure, programs and services; and repayments made or credits provided to electric utility customers, pursuant to Section 9 of Act 211(13). The Authority respectfully submits this status report outlining the steps taken to further design, develop and deploy GEMS capital in 2016 as well as plans for 2017.

## **I. GEMS Program Background and Context**

### **Legislative Authorization**

On April 30, 2013, the Legislature enacted, and on June 27, 2013, the Governor signed into law, Act 211, authorizing the establishment of a green infrastructure financing program, known as GEMS to deploy clean energy infrastructure that will contribute towards Hawaii's aggressive pursuit of its statutory 100% clean energy goals by 2045 while helping ratepayers lower their energy costs.

Act 211 established a legal structure that enabled DBEDT to issue bonds to fund green infrastructure financing programs, leveraging public and private capital, to facilitate the achievement of the State of Hawaii's aggressive clean energy goals and provide opportunities for consumers to invest in and save money from green infrastructure investments.

Key objectives of the GEMS program are to:

1. Address financing market barriers to increase the installation of clean energy projects and infrastructure to meet the State's clean energy goals, including the RPS and EEPS;
2. Democratize clean energy by expanding access and affordability of renewable energy and energy efficiency projects for identified underserved markets, while expanding the market generally;
3. Enable more ratepayers to reduce their energy use and energy costs by helping them finance clean energy improvements;
4. Partner with and support existing market entities in the clean energy and financing sector to ensure GEMS can bridge market gaps and facilitate a sustainable and efficient private sector market; and
5. Balance the aforementioned goals and objectives with repayment risk to achieve an appropriate rate of return and build a sustainable financing program.

### **PUC Approval and Orders**

To effectuate Act 211, GEMS required Commission approval of its Financing Order and Program Order Applications. The PUC approved the GEMS Financing Order on September 4, 2014 and the GEMS Program Order on September 30, 2014.

The regulatory Orders approved by the Commission established the general parameters and program processes for GEMS. With feedback and support from several interveners - including but not limited to the Consumer Advocate and the Hawaii Solar Energy Association, the PUC granted GEMS the flexibility to work with the market to provide financing programs to enable more of Hawaii's consumers to invest in and benefit from clean energy.

Pursuant to HRS 269-162, the Financing Order provided regulatory approval for the issuance of low-cost Green Infrastructure Bonds (GEMS Bonds) to capitalize the GEMS Loan Fund. Pursuant to HRS 269-170, the Program Order provided approval for the deployment of funds from the

issuance of the GEMS Bonds. Included in the Program Order were general program parameters and specific deployment strategies, outlining a clean energy financing program that was best thought to serve Hawaii's consumers at that time.

## **GEMS Bond Issuance**

With approvals required from the PUC, DBEDT issued a \$150 million in Green Energy Market Securitization Series 2014-A Bonds on November 13, 2014. The issuance was designated a green bond, which attracted investors looking for socially responsible investments. The issuance was rated Aaa/AAA/AAA by Moody's Investors Service, Standard & Poor's and Fitch Ratings, respectively, and was priced at a yield of 2.99% with a weighted average life of 7.8 years.

With the issuance of the Green Energy Market Securitization Series 2014-A Bonds on November 13, 2014, DBEDT received national and international recognition through the following awards:

- ✓ 2014 Council of Development Finance Agencies, Excellence in Energy Finance Award
- ✓ 2014 International Financing Review, North America Structured Finance Issue of the Year Award
- ✓ 2014 International Financing Review Americas, US Structured Finance Issue of the Year Award
- ✓ 2015 The Bond Buyer, Deal of the Year: Non-Traditional Financing

## **GEMS Estimated Impact**

GEMS-financed projects will contribute not only to the achievement of the RPS and EEPS, but also to the infrastructure investments needed for Hawaii to meet its 2045 clean energy mandates. Outlined below is a summary of GEMS' anticipated benefits and impacts, based on its initial clean energy technology focus on solar PV.

The following are the estimated impacts and benefits of GEMS:

### *Energy and Environmental Impact*

- ✓ More than 92 gigawatt-hours of solar energy may be produced annually through projects financed by combining up to \$143 million of Green Infrastructure Proceeds with private capital. This represents approximately 0.95% of the State's annual electricity consumption.<sup>1</sup>
- ✓ The energy production from over 7,400 financed solar photovoltaic projects has the estimated impact of reducing petroleum consumption by over 7 million gallons or 169,000 barrels annually.<sup>2</sup>

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<sup>1</sup> The calculation uses an annual electricity production in Hawaii of 9,639 GWh for 2012, based on the DBEDT Hawaii Energy Facts & Figures, November 2013, page 2.

<sup>2</sup> Calculated on 542 kWh/barrel and 13 kWh/gallon, as based on the US Energy Information Administration webpage - <http://www.eia.gov/tools/faqs/faq.cfm?id=667&t=6> - as of December 6, 2013.

<sup>3</sup> R. Braccio, Booz Allen Hamilton, "Hawaii Clean Energy Initiative Scenario Analysis", March 2012.

<sup>4</sup> Total gigawatt-hour production from GEMS supported systems multiplied by the average kWh cost in Oahu as of December 1, 2013 less average kWh cost of financing (\$0.3322- \$0.225=\$0.107) as shown at <http://www.hawaiienergy.com/get-the-facts>.

### Economic Development Impact

- ✓ A third party analysis of the Hawaii Clean Energy Initiative revealed the need for in excess of \$16 billion in capital expenditures across renewable energy and energy efficiency technologies in order to meet the State's clean energy goals.<sup>3</sup> Projects financed through Green Infrastructure Funds will contribute not only to the RPS, but also to the infrastructure investment needed for Hawaii to meet the 2045 goal.

### Cost Savings Metrics

- ✓ Statewide estimated energy and cost savings resulting from projects financed through GEMS is 92 gigawatt-hours per year with an estimated cost savings of over \$9.8 million.<sup>4</sup> A customer that uses a product deployed with GEMS Proceeds may save 7,200 kWh per year, with an average bill savings of over 20%.

As this then highly innovative program was at the forefront of the renewable energy industry when it launched in 2014, there was uncertainty in the time required to realize these benefits, as the products and services being created were without any precedent in the commercial market and required significant analysis, effort, stakeholder engagement and marketing to establish.

## **Hawaii Green Infrastructure Authority**

In order to oversee the GEMS program, the Hawaii Green Infrastructure Authority was constituted on October 23, 2014. HGIA is overseen by a five-person board of directors and is administratively attached to DBEDT. The Authority is tasked with administering and governing the GEMS Program and ensuring that capital is deployed effectively to achieve program objectives. HGIA is committed to the accountable use of funds through various reporting mechanisms, including submitting Legislative Reports, providing quarterly and annual reports to the PUC, as well as performing annual audits.

## **II. Effect of External Factors**

As noted in previous Legislative Reports, GEMS is subject to a number of powerful external factors which has adversely affected the progress of the program over the last few years:

### Interconnection

With the unprecedented growth in solar PV installations in 2012 and 2013, the utility was faced with technical challenges including saturation of circuits in many communities and intermittent renewable energy production leading to grid stabilization concerns. As a result, the utility made changes to its interconnection requirements and procedures causing a prolonged delay in residential interconnection approvals during a period in 2014 - 2015. While resolved in early 2015, there remained a significant backlog of permitting and installations through the remainder of that year. These delays significantly slowed the development of a meaningful pipeline for the GEMS Residential Solar PV Program.

### Net Energy Metering

In October 2015, the PUC announced the discontinuation of net energy metering for new residential solar customers in Hawaii. The new tariffs significantly altered the economic returns for traditional residential solar PV installations. This change has had a significant near-term impact on the demand for, and the long term potential of the GEMS Residential Solar PV Product in its current form. There remains approximately 7,500 homeowners in some stage of the HECO Companies' NEM review or approval process as of November 29, 2016. With the Customer Grid-Supply program fully subscribed, ratepayers interested in converting to clean energy will need to also install energy storage to complement its solar PV system under the remaining Customer Self-Supply program.

## **III. 2016 GEMS Program Activities**

### **Governance and Administration**

HGIA is approved for a staff of 5.5 FTE. While it is planning to fill the Executive Director and another vacant staff position in the near future, it is currently operating with 3.5 FTE. By controlling expenses, the program has operated below its established operating budget and overhead limits, providing it the agility and flexibility to re-allocate resources to the critical, yet unbudgeted On-Bill Repayment Project during this current fiscal year. The Authority has been overseen by two interim Executive Directors from October 2014 to February 2015 and March 2015 to October 2015; as well as an Executive Director from October 2015 to September 2016.

### **Lending Activities**

While the financing market, energy industry and regulatory environment continued to evolve, GEMS developed financing programs based on 2012 - 2013 research and data. Additionally, out-of-state deployment partners resulted in unforeseen challenges with different time zones, archaic processes (i.e. mailing paper applications, etc.) and a lack of commitment to the Hawaii market, resulting in longer processing times, below acceptable customer service delivery, and in the case of the original nonprofit and small business product, the shuttering of programs.

However, 2016 was a pivotal year for GEMS as the program finally started funding loans in January, more than thirteen (13) months since bond issuance and three (3) years since the passing of Act 211.

This current 2016 year was focused on streamlining the Residential Loan Product as well as re-inventing and launching its new Commercial PV Loan Products for nonprofits, small businesses and multi-family projects.

### Residential PV Loan Product

Based on industry feedback, the Authority made the following product enhancements during the year to increase customer convenience, improve service delivery and expand affordability and access of solar PV systems for the underserved markets:



- ✓ Online application option and auto-decisioning implemented in late June 2016;
- ✓ Flat 5.99% interest rate, regardless of credit score approved in late September, replaced risk-based pricing previously ranging from 6.5% to 9.875%;

Further enhancements, including financing properties held in trust and progress payments are being developed for implementation during 2017.

### Commercial PV Loan Products

In late September, after receiving Commission and Board approval, the Authority launched two new commercial loan products, Commercial PV Loan Product: Project Sponsor and Commercial PV Loan Product: Direct. The design of these loan structures included three objectives:

1. To collaborate and partner with commercial banks and other financial institutions;
2. To be more flexible and competitive; and
3. To fill a market gap with an unconventional financing tool.

The result is a co-lending structure with a capital stack of private and public debt. This long-term financing tool is designed to complement conventional bank/credit union financing and provide low-cost, cash flow friendly capital to encourage clean energy adoption via the installation of solar photovoltaic systems.

The two products are essentially identical with the key difference of the Project Sponsor product being for loans made to investors who purchase and own PV systems for nonprofits and businesses that do not have a tax appetite and cannot leverage the solar energy tax credits and the Direct product being for loans made to small businesses and for-profit apartment building owners to install and own its PV system.

As of December 9, 2016, GEMS has funded thirty-one (31) loans aggregating \$1,831,059 million, consisting of the following:

- ✓ Twenty-nine (29) residential loans totaling \$969,559. Ninety percent (90%) of these loans were made to low and moderate income households;
- ✓ Two (2) commercial loans totaling \$861,500. These loans financed two solar systems with a total project cost of \$1.4 million for a 270-unit mixed income multi-family rental apartment project with 20% of its units reserved for low-income families defined as <80% Area Median Income.

The Authority's loan originator has twenty-eight (28) approved residential loans in process aggregating \$967,786, which are expected to fund over the next few months.

Under its commercial loan program, the Authority is currently underwriting a \$550,000 loan to finance two nonprofits with total project costs aggregating \$1.1 million, as well as reviewing a \$592,000 request for a Hilo business with a total project cost of \$987,000. The Authority has also received fifteen (15) inquiries for financing over the last month for projects aggregating some \$8.3 million.

The Authority is collaborating with Sustainable Molokai and Hawaii Energy on an initiative to

install up to 1,200 solar hot water heaters on Molokai rooftops. This project is expected to launch during Summer 2017 and will require HGIA to successfully execute on the following:

- ✓ On Bill Repayment Program (see below); and
- ✓ PUC Approval of a Program Modification to finance residential energy efficiency.

The Authority will be committing up to \$9.6 million of GEMS funds for this project.

### **Benefiting the “Underserved”**

According to the Commission’s Decision and Order No. 32318 in Docket No. 2014-0135, the GEMS funds should benefit 50% plus 1 of the “Underserved” defined as renters, nonprofits and low and moderate-income households.

To date, GEMS is exceeding the minimum required with twenty-nine (29) out of thirty-one (31) loans or 93% benefitting the underserved. Slicing the data another way, \$1,762,687 out of \$1,831,059 or 96% of the funds loaned to date benefit the underserved.

Twenty-seven (27) out of the twenty-nine (29) residential loans were made to low and moderate income households. Both of the commercial loans were made to benefit a multi-family rental apartment project. While Hawaii does not have a Virtual Net Metering Tariff,<sup>3</sup> which could allow residents in a multitenant building to participate in a common system on the roof of their building, the renters of these multi-family projects benefit with lower common area utility costs, which in turn, helps to better control future rent increases.

### **Programs Under Development**

#### On Bill Repayment (OBR)

On July 8, 2011, HRS 269-125 was signed into law directing the Commission to investigate an on-bill financing (OBF) program for electric utility customers to purchase or otherwise acquire a renewable energy system or energy-efficient device through an assessment on the customer’s utility bill. On February 1, 2013, the Commission issued an order which, amongst other things found that a properly designed on-bill financing program could be viable and established an on-bill financing working group to develop the program.

On January 9, 2015, the Commission issued the final Program Manual for the Hawaii Energy Bill Saver program. In October 2015, AFC, the OBF Finance Program Administrator was acquired by RenewFinancial and informed the Commission that it will terminate its role in the OBF Program on December 31, 2015. On May 20, 2016, the Commission suspended its efforts to establish and implement an on-bill financing program. It also directed the HECO Companies to work directly with HGIA to design and implement an on-bill repayment (OBR) mechanism for the exclusive use of HGIA.

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<sup>3</sup> Please refer to “Virtual Net Metering Policy Background and Tariff Summary Report” prepared by the Center for Sustainable Energy, California Solar Energy Industries Association and Interstate Renewable Energy Council on p. 10.

The Authority strongly believes that OBR can be a critical tool to enable green infrastructure financing for the underserved (i.e. renters and low and moderate-income households) and has been actively working with HECO and its Loan Servicer on the scope and deliverables to implement the program on the IT and loan servicing level. On December 9, 2016, HGIA’s Board approved a \$247,000 OBR Implementation Budget, which will be “funded” out of unused or partially used approved budget categories re-allocated out of the current 2017 budget, for IT programming and testing costs. Simultaneously, the Authority has convened a small working group to finalize the OBR Program Manual for submission to the Commission. Pending Commission approval (on the program level) and successful testing (on the IT level), the Authority is anticipating a 2017 launch.

**PV plus Storage Financing**

The Authority filed Program Notification No. 7 with the Commission on July 22, 2016 regarding deployment of capital for consumer PV with battery. On August 2, 2016, the Consumer Advocate filed comments requesting that the Authority provide further information regarding (1) modifications made to the existing Consumer PV program and their impact on the types of customers likely to receive GEMS Program financing; (2) the “public benefit” associated with the proposed Consumer PV with Battery program and who is likely to benefit; and (3) how the proposed Consumer PV product will expand access to financing for customers, particularly those who are underserved. On August 12, 2016, the Commission suspended Program Notification No. 7 pending the Authority’s response to comments from the Consumer Advocate.

The Authority believes that its ability to finance storage is critical, especially given the limited interconnection options currently offered by the utility. Staff is developing a response to address the Consumer Advocate’s concerns and will be submitting a revised Program Notification No. 7 in the near future.

**Impacts**

	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
<b>Energy &amp; Environmental Impacts</b>					

**Clean Energy Production of Projects Financed**

Installed Capacity (Actual kW)	35.9	64.8	48.0	357.6	506.3
Total Annual Production (Estimated kWh)	51,132	93,100	75,187	601,176	820,595
Total Project Production Over Lifetime of Installed PV (Projected kWh) (including 0.50% degradation)	975,491	1,776,153	1,434,410	11,469,170	15,655,224

**Petroleum Displaced by Clean Energy and Energy Efficiency Projects**

Petroleum Displaced/Saved based on Annual Clean Energy Generation (Estimated barrels)	31.4	57.2	46.2	368.7	503.5
Petroleum Displaced Over Lifetime of Installed PV (Projected barrels)	599.1	1,090.9	881.0	7044.5	9615.5

1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
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### Greenhouse Gas Avoided

Greenhouse Gas Avoided from Clean Energy Annual Production (Estimated metric tons CO <sub>2</sub> )	15.4	28.0	22.6	181.6	247.6
Greenhouse Gas Avoided Over Lifetime of Installed PV (Projected metric tons CO <sub>2</sub> )	293.6	534.1	431.7	3,461.2	4,720.6

### Projects Financed According to Technology Type/Category

Solar Photovoltaic Systems, including advanced inverters and smart modules	4	8	5	14	31
Energy Storage	0	0	0	0	0
Lighting Upgrades	0	0	0	0	0
HVAC Upgrades	0	0	0	0	0
Mechanical Upgrades	0	0	0	0	0
Controls and Monitoring Devices	4	8	5	14	31
Energy/Water Nexus	0	0	0	0	0
Total Number of Projects	4	8	5	14	31
Indirect Economic Impact of Capital Deployed (jobs created/retained) <sup>4</sup>	2.1	3.8	2.9	19.3	28.1

### Market Expansion Impact

	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
<b>Residential PV Loan Program</b>					
Total Number of GEMS Loans	4	8	5	12	29
Total Number of Loans Serving Underserved Market <sup>5</sup>	4	6	5	12	27

### Status of Applications:

Number of Residential PV Applications Received	21	48	36	34	260
Number of Residential PV Applications Conditionally Approved	9	14	17	20	N/A
Number of Residential PV Applications Declined	6	18	13	12	103
Number of Residential PV Applications Withdrawn	27	4	2	2	75
Number of Residential PV Applications Loan Docs Accepted	14	17	4	28	N/A

<sup>4</sup> Utilizing the SBA's metric of one job created or retained for every \$65,000 in loans extended.

<sup>5</sup> See AMI distribution.

<b>Geographic Location</b>	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
Number of Loans on Oahu	3	5	4	10	22
Number of Loans on Maui	1	3	1	2	7
Number of Loans on Molokai	0	0	0	0	0
Number of Loans on Lanai	0	0	0	0	0
Number of Loans on Hawaii	0	0	0	0	0

### Profile of Customers

#### Number of Customers By Customer FICO Credit Score

700 and above	1	2	0	4	7
675-699	1	4	3	5	13
650-674	2	0	0	3	5
620-649	0	2	1	0	3
600-619	0	0	1	0	1

#### Number of Customers By Income Distribution (self-reported by customers)

Under \$15,000	0	0	0	0	0
\$15,000-\$24,999	0	0	0	0	0
\$25,000-\$34,999	0	0	0	0	0
\$35,000-\$49,999	0	1	0	1	2
\$50,000-\$74,999	1	0	1	6	7
\$75,000-\$99,999	2	4	2	5	11
\$100,000 and Above	1	3	2	5	9

#### Number of Customers by Area Median Income<sup>6</sup>

<30% AMI	0	0	0	0	0
30% to <50% AMI	0	2	0	2	4
50% to <80% AMI	1	0	0	5	6
80% to <140% AMI	3	4	5	5	17
> 140% AMI	0	2	0	0	2

### Commercial PV Loan Program

	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
Total Number of GEMS Loans	0	0	0	2	2
Number of Nonprofits Participating in GEMS	0	0	0	0	0

#### Status of Applications:

Number of Commercial PV Applications Received	0	0	2	2	4
Number of Commercial PV Applications Approved	0	0	0	2	2
Number of Commercial PV Applications Declined	0	0	0	0	0
Number of Commercial PV Applications Withdrawn	0	0	0	0	0

<sup>6</sup> Area Median Income as provided by the U.S. Department of Housing and Urban Development (HUD). <30% AMI = Extremely Low Income; 30% to <50% AMI = Very Low Income; 50% to <80% AMI = Low Income; 80% to < 140% AMI = Moderate Income.

	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
Number of Commercial PV Applications Under Review	0	0	2	2	N/A

**Geographic Location**

Number of Loans on Oahu	0	0	0	2	2
Number of Loans on Maui	0	0	0	0	0
Number of Loans on Molokai	0	0	0	0	0
Number of Loans on Lanai	0	0	0	0	0
Number of Loans on Hawaii	0	0	0	0	0

<b>Number of Small Businesses Participating in GEMS</b>	0	0	0	0	0
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**Number of Small Businesses by Gross Receipts**

Up to \$9,999	0	0	0	0	0
\$10,000-\$24,999	0	0	0	0	0
\$25,000-\$99,999	0	0	0	0	0
\$100,000-\$499,999	0	0	0	0	0
\$500,000-\$999,999	0	0	0	0	0
\$1,000,000-\$4,999,999	0	0	0	0	0
Above \$5,000,000	0	0	0	0	0

**Number of Small Businesses by Average Number of Employees**

≤10 Employees	0	0	0	0	0
11-50 Employees	0	0	0	0	0
51-100 Employees	0	0	0	0	0
101-250 Employees	0	0	0	0	0
251-500 Employees	0	0	0	0	0
501-1,000 Employees	0	0	0	0	0
>1,000 Employees	0	0	0	0	0

<b>Number of Rental Units Supported by GEMS</b>	0	0	0	270	270
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**Cost Savings Impact**

	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
Aggregate Estimated Electricity Cost Savings From Energy Production (life of system <sup>7</sup> ) (\$)	\$223,783	\$415,991	\$191,423	\$1,232,766	\$2,063,963
Average Estimated Electricity Cost Savings From Energy Production (life of system) for Consumers (\$)	\$55,946	\$51,999	\$38,285	\$41,630	\$45,888

<sup>7</sup> "Life of System" estimates are based on a typical 0.5% annual degradation of solar panel production and a very conservative 2.5% annual increase in the utility cost. HECO's actual historical 10-year annual average increase is 5.72%, based on 2006 to 2015 metrics provided at: <https://www.hawaiianelectric.com/about-us/key-performance-metrics/rates-and-revenues>. Additionally, in mid-December 2016, HECO filed a request to increase rates by 6.9%, effective 2017, with the Commission.

	1Q2016 1/1 – 3/31/16	2Q2016 4/1 – 6/30/16	3Q2016 7/1 – 9/30/16	4Q2016 10/1 – 12/9/16	Since Program Inception
Average Estimated Electricity Cost Savings From Energy Production (life of system) for Non-Consumers (\$)	0	0	0	\$366,598	\$366,598
Average System Cost per Watt for All Consumers (PV) (\$)	3.84	3.90	\$4.07	4.06	3.99
Average System Cost per Watt for Underserved Consumers (PV) (\$)	3.84	3.90	\$4.07	4.06	3.99
Average System Size for All Consumers (PV) (kW)	8.9	8.1	9.6	8.1	8.5
Average System Size for Underserved Consumers (PV) (kW)	8.9	9.1	9.6	8.1	8.5

**III. 2017 Outlook and Plan**

While the GEMS program has suffered setbacks, namely the high turnover of its Executive Director position (2/2015; 10/2015 and 9/2016); the shuttering of its initial nonprofit/small business loan products (12/2015); and external environmental changes, the Authority’s deployment of loan funds, which began in January, has gained positive momentum and is expected to consistently continue during the remainder of the current fiscal year.

However, dynamic changes in the global, national, and Hawaii energy markets will continue to evolve and significantly alter the landscape for infrastructure financing in the near and long-term future. As such, the models and programs originally contemplated in the initial Program Order to the Commission are no longer sufficient to achieve the projected GEMS program impact. GEMS has the potential to play a critical role in Hawaii to foster innovative new technologies and financing models that may not yet be supported by the conventional financing market.

As a public finance authority that uses limited public funds to leverage private investment in clean energy, HGIA seeks to accelerate clean energy market growth while making energy cheaper and cleaner for consumers, driving job creation, and preserving taxpayer dollars. By deploying low-cost capital efficiently through financing to maximize private investment, and lower the costs of clean energy to spark consumer demand, rather than having the industry rely on subsidies that cannot bring markets to scale, HGIA’s goal is to use the GEMS funds to offer financing that attracts private investment, enabling a wider reach and the exponential potential for greater impacts by recycling, re-investing and re-lending that same funds.

While part of GEMS’ deployment challenges have been due to external changes, a significant impediment hindering the Authority’s ability to react in a nimble and timely manner to market changes and demands, is its lengthy, expensive and burdensome approval process, which has resulted in missed market opportunities for PV and non-PV related projects.

Currently, governance over any new lending activity requires a two-step approval process. First,

through an inefficient and time consuming docket process, communicating to the decision-maker via the filing of static documents (i.e. Program Notifications, Program Modifications, etc.), comments and rebuttals or clarifications, which does not allow for time sensitive, engaging or meaningful discussions during the decision making process. Secondly, execution is further delayed with the requirement of obtaining Board approval following Commission approval. Changing the composition of the board to include more energy stakeholders would enable the Authority to react quicker to market changes and deploy capital for green infrastructure investments in a timely manner to help meet the state’s clean energy goals and objectives.

**2017 Activities and Timeline**

The Authority will continue to accelerate the momentum of the last few months to meet the goals and objectives of the GEMS program. In addition to its current financing products, the Authority will implement an On-Bill Repayment Program and expand its product mix to include but not be limited to the following:

- ✓ Residential Energy Efficiency Loan Product;
- ✓ Commercial Energy Efficiency Loan Product for nonprofits, small business and multi-family projects;
- ✓ PV + Storage Loan Products;
- ✓ Community Solar Loan Products

Key priorities, milestones and timelines for the upcoming year are:

Date	Milestones
4Q2016	Launched Commercial PV Loan Products for nonprofits, small businesses and multi-family apartment projects, and funded first loan
	Began On Bill Repayment Implementation
	Commit up to \$9.6 million for the Molokai Solar Hot Water Project
1Q2017	Fill vacant Executive Director position
	Launch Residential Energy Efficiency Loan Product
	Launch Commercial Energy Efficiency Loan Product for nonprofits, small businesses and multi-family projects
	Obtain PUC Approval for On Bill Repayment Program
	Launch PV + Storage Loan Products
2Q2017	Launch On Bill Repayment Program
	Launch Molokai Solar Hot Water Project
3Q2017	Launch Community Solar Financing Product
4Q2017	Finance other Clean Energy Technology Projects

**CONCLUSION**

While the GEMS program was unable to perform up to initial expectations, the Authority has begun funding loans in 2016 and continues to gain momentum with the expectation of ending fiscal 2017 with some \$15.0 million in loans funded and/or committed.



Further, with the implementation of the On-Bill Repayment mechanism imminent, after the Commission and key stakeholders devoted considerable time and resources to set the foundation and complete its framework over the last five years in Docket No. 2014-0129, the Authority is eager to leverage this mechanism to democratize clean energy by expanding access and affordability of renewable energy and energy efficiency projects for renters and low and moderate income homeowners, as was the original intent of the legislation.

GEMS funding is uniquely positioned to have significant, positive impact in the coming years. As a market-based program, it is critical for GEMS to remain flexible and open to innovation in a rapidly moving sector of the market, which requires the full empowerment and decision making authority of HGIA's Board. We remain confident that the program can be instrumental in achieving the State's energy sustainability.