



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

**STATUS OF THE
GREEN INFRASTRUCTURE AUTHORITY'S ACTIVITIES**

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

Pursuant to

Act 211, Session Laws of Hawaii 2013

December 2014

Prepared by the
State of Hawaii
Department of Business, Economic Development and Tourism with
Renewable Funding and the Hawaii Green Infrastructure Authority

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Executive Summary

On April 30, 2013, the Hawaii State Legislature (“Legislature”) passed Senate Bill 1087, CD 1, “Relating to Green Infrastructure” and, on June 27, 2013, Governor Neil Abercrombie signed this bill into law as Act 211, Session Laws of Hawaii 2013 (“Act 211”), establishing a green infrastructure financing program known as GEMS, or Green Energy Market Securitization. GEMS is a high impact strategy to deploy clean energy infrastructure that will contribute towards Hawaii’s pursuit of its statutory 70% clean energy goals by 2030 and to help consumers lower their energy costs.

In the year since Governor Abercrombie signed Act 211 into law, the Department of Business, Economic Development and Tourism (DBEDT) and the Hawaii Green Infrastructure Authority (HGIA), which was constituted on October 23, 2014, has worked with hundreds of public and private sector stakeholders, as well as the Hawaii Public Utilities Commission (PUC), the Consumer Advocate and others to develop and establish GEMS in such a way that it achieves its objectives (for a list of these see GEMS Overview section).

On June 6, 2014, DBEDT submitted to the PUC two application requests: a Request for the approval of a Financing Order and a Request for the approval of a Program Order. On September 4, 2014, the PUC approved the Financing Order and on September 30, 2014 the PUC approved the Program Order. Taken together, these Orders allowed GEMS to move forward in capitalizing and starting the program. The Orders determine the means by which GEMS may capitalize the program and operate on an ongoing basis.

By issuing the Financing Order and Program Order, the PUC approved GEMS as a first-of-its-kind, innovative financing model that uses securitization techniques, typically used by the utility sector, to raise bond proceeds to fund clean energy technologies for Hawaii’s consumers. Additionally, Hawaii consumers will also be able to repay GEMS financing through yet another innovative financing structure: on-bill repayment, which is currently pending PUC approval. GEMS’ use of these innovative financing structures will enable more Hawaii consumers to enjoy the benefits of clean energy.

Since the issuance of the Green Energy Market Securitization Series 2014-A Bonds on November 13, 2014, DBEDT has 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

In its first phase, GEMS will support a variety of clean energy improvements, especially solar photovoltaic (PV) installations and related technologies that improve the grid and mitigate challenges associated with interconnection. In particular, GEMS will focus on

making solar PV more affordable and accessible for Hawaii’s underserved consumers, such as low- and moderate-credit homeowners, renters and nonprofits. GEMS is also authorized to support commercial efficiency, light-emitting diode (LED) lighting upgrades, energy/water projects and additional technologies as a result of the PUC order.

This Legislative Report provides an update on activities related to the development and launch of GEMS.

Reporting Pursuant to Act 211, Session Laws of Hawaii 2013

This report is respectfully submitted to fulfill the requirement to report on the status of the Hawaii Green Infrastructure Authority’s activities,¹ including approved loan program description and uses; summary information and analytical data concerning 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. DBEDT respectfully submits this status report, outlining the steps taken to design, develop and launch GEMS in 2014.

I. Introduction and Context

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. GEMS is a high impact strategy to deploy clean energy infrastructure that will contribute towards Hawaii’s aggressive pursuit of its statutory 70% clean energy goals by 2030 and to help consumers lower their energy costs.

The Legislature found in Act 211 that “building Hawaii’s clean energy infrastructure at the lowest possible cost is vital to the State reaching its seventy percent clean energy goal in 2030.” Further:

“The legislature finds that significant investment in infrastructure installations is required to achieve the State’s goals of energy self-sufficiency, greater energy security, and greater energy diversification, and to support the achievement of the renewable portfolio standards and energy efficiency portfolio standards, as established in chapter 269, Hawaii Revised Statutes. These green infrastructure investments are to support Hawaii’s evolving energy market and ecosystem and to provide affordable energy options for all of Hawaii’s consumers. Further, these infrastructure installations will require significant amounts of capital, and it is in the public interest to minimize these costs. A key component to minimizing costs is reducing the cost of capital required to finance infrastructure installations.

¹ Until the Authority is duly constituted, DBEDT may exercise all powers reserved to the Authority and shall perform all responsibilities of the Authority, pursuant to HRS 196-63.

The legislature further finds that the upfront costs of green infrastructure equipment are a barrier preventing many electric utility customers from investing in these infrastructure installations. Existing programs and incentives do not serve the entire spectrum of the customer market, particularly those customers who lack access to capital or who cannot afford the large upfront costs required, thus creating an underserved market. It is in the public interest to make cost-effective green infrastructure equipment options accessible and affordable to customers in an equitable way.”

GEMS Overview: Democratizing Clean Energy

The State of Hawaii established a 70% clean energy goal to achieve by 2030, as codified in Hawaii Revised Statute (HRS) 269-92 and 269-96—reducing electrical energy consumption by 30% under the Energy Efficiency Portfolio Standard (EEPS) and increasing electrical generation from renewable resources to 40% under the Renewable Portfolio Standard (RPS).

Act 211 established a legal structure that enables DBEDT to issue bonds to fund green infrastructure financing programs in a manner to efficiently leverage public and private capital to facilitate the State of Hawaii meeting its aggressive clean energy goals and providing opportunities for consumers to invest in and save money from green infrastructure investments.

Key objectives of the GEMS 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.

In its initial deployment, GEMS will focus primarily on support for solar PV systems and related technologies, in order to address interconnection challenges and also expand the market to include underserved segments such as low- to moderate-credit homeowners, renters and nonprofits. GEMS aims to achieve its key objectives and deploy capital quickly by leveraging existing channels and market players, while at the same time balancing risk and repayments.

GEMS Estimated Impact

GEMS-financed projects will contribute not only to the achievement of the RPS and EEPS, but also to the infrastructure investment needed for Hawaii to meet its 2030 clean energy mandates. Outlined below is a summary of GEMS' anticipated benefits and impacts, based on an initial program focus on solar PV.

Estimated impacts and benefits of GEMS are estimated to be as follows:

Energy and Environmental Impact

1. 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.²
2. 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.³

Economic Development Impact

3. 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.⁴ 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 2030 goal.

Cost Savings Metrics

4. 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.⁵ 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%.

Due to its innovative structure and projected impacts, GEMS is garnering interest from several other states and advocacy groups as a potential financing solution to make clean energy more accessible for all consumers. In addition, similar programs like the New York Green Bank and Connecticut Green Bank have already reached out to coordinate efforts. GEMS will be at the forefront of a national effort to transition from a petroleum-based economy to a clean energy economy.

² 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.

³ 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.

⁴ R. Braccio, Booz Allen Hamilton, "Hawaii Clean Energy Initiative Scenario Analysis", March 2012.

⁵ 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>.

II. Program Implementation

PUC Approval and Orders

To effectuate Act 211, GEMS required PUC 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 PUC established the general parameters and program processes for GEMS. With feedback and support from several interveners—including the Consumer Advocate and Hawaii Solar Energy Association, among others—the PUC granted GEMS the flexibility to effectively work with the market to provide efficient and effective financing opportunities to enable more of Hawaii’s consumers to invest in and benefit from clean energy.

Pursuant to HRS 269-162, the Financing Order provides regulatory approval for the issuance of low-cost Green Infrastructure Bonds (GEMS Bonds), which will be deployed through GEMS. Pursuant to HRS 269-170, the Program Order provides approval for the deployment of the funds from the issuance of GEMS Bonds. Included in the Program Order are general program parameters and specific deployment strategies to ensure an effective clean energy financing program to best serve Hawaii’s consumers.

GEMS Bond Issuance

With PUC orders approved, DBEDT issued \$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.

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

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- 2014 International Financing Review Americas, US Structured Finance Issue of the Year Award

GEMS Program Timeline

In the first quarter of 2015, GEMS will launch its first phase of activities, in collaboration with HECO, the PUC, a fund manager, three deployment partners and multiple Hawaii-based installers. GEMS’ first phase will focus on the deployment of solar PV and related technologies with an emphasis on serving underserved markets like nonprofits, renters and homeowners who have not previously had access to financing for solar PV. Additional

clean energy technologies will be considered on an ongoing basis through an open solicitation process.

Over the past year, the GEMS team solicited feedback from the solar industry, including the network of finance providers and contractors that are actively engaged in the Hawaii market. The feedback informed overall program design and specific strategies for GEMS' first phase.

Additionally, concurrent with the PUC's regulatory process, the GEMS team worked to recruit multiple private sector deployment partners. Once the regulatory process concluded in September 2014, the GEMS team negotiated term sheets with these and other market players and is currently entering into formal agreements for the deployment of GEMS funds. The initial deployment of GEMS funds is targeted to occur over the next 24 months, through December 2016.

Figure 1 below represents the key milestones for the development and implementation of GEMS.

Figure 1. GEMS Timeline

Date	Milestone
Q2 2014	Financing Order Application submitted
Q2 2014	Program Order Application submitted
Q3 2014	PUC approval of Financing Order
Q3 2014	PUC approval of Program Order
Q4 2014	Constituted Hawaii Green Infrastructure Authority
Q4 2014	GEMS \$150 Bond Issued
Q4 2014	Finalize Agreements with Deployment Partners and Installers
Q1 2015	Announce Deployment Partners and Installers
Q1 2015	Program Launch/Deployment Begins
Q1 2015	Complete Hawaii Green Infrastructure Authority Setup

The first phase of deployment for GEMS will focus on broadening access to and affordability of solar photovoltaic installations to underserved markets. Over time, GEMS will also support other resources and technologies throughout the renewable energy and energy efficiency landscape. GEMS is currently approved to support solar PV, energy storage and grid modernization technologies, commercial efficiency, LED lighting, and energy/water projects.

GEMS Support for Solar PV

The Program will provide debt capital to the market in partnership with private sector entities (“Deployment Partners”)⁶ that will use such capital to support directly or indirectly financing products serving ratepayers. GEMS will ensure Deployment Partners are providing access to underserved markets as a condition of their participation. Pursuant to HRS §196-64(a)(1), GEMS will deploy funds through Deployment Partners utilizing two key methods: unleveraged debt and leveraged debt. The end-market consumer financing products that may be served by GEMS debt issuance include loans, leases and power purchase agreements (PPAs). Unlike one-time rebates or subsidies, GEMS’ solar PV financing is intended to be self-sustaining. As Hawaii consumers who directly benefit from GEMS repay their obligations, those repayments become available to first replenish the Public Benefits Fee, then, if excess repayments are available, be redeployed.

GEMS Support for Additional Projects & Technologies

As a market-based initiative operating in a rapidly evolving landscape, GEMS requires administrative flexibility to adapt to movements in the market. One of GEMS’ key methods for maintaining an open dialogue with market participants will be its Open Solicitation Process. The goal of maintaining such a process is to allow the industry and stakeholders to propose for financing high impact projects that GEMS may not otherwise be aware of.

Beginning in January 2015, GEMS will invite private sector capital providers and other clean energy industry participants to propose transactions involving partnership with GEMS that facilitate the financing of eligible clean energy projects in the State of Hawaii, consistent with GEMS’s mandate and PUC order to address various barriers related to clean energy deployment.

Governance and Quality Assurance

DBEDT is committed to the successful launch of GEMS and the responsible deployment of funds and is overseeing all team members working on launching GEMS. In addition to the already mentioned regulatory processes required under Act 211, DBEDT is committed to the accountable use of funds through various reporting mechanisms, including submitting Legislative Reports, providing quarterly reporting through PUC processes, as well as performing annual audits.

III. Update on External Risk Factors to GEMS

GEMS aims to offer financing products to overcome barriers to investing in clean energy, but there continue to be exogenous challenges. GEMS implementation could be hindered

⁶ Deployment Partners may include a variety of private sector entities. Examples of Deployment Partners include but not limited to: third party specialty originator and servicers, financial institutions from credit unions to commercial banks, solar companies, and solar project developers.

by external factors beyond any program design and development planning, and beyond DBEDT's control and ability to forecast.

- **Interconnection:** The solar PV market faces several immediate technical challenges with many circuits being highly penetrated with intermittent renewable energy, leading to limits on utility interconnection and changing interconnection procedures. GEMS is currently assessing the use of storage technologies to improve interconnection challenges and is monitoring ongoing PUC dockets relating to distributed generation and non-export model for interconnection.
- **On-bill mechanism:** The timely and successful build-out of the on-bill repayment mechanism by the PUC will impact the ability of GEMS to utilize the mechanism in the initial deployment. The use of on-bill mechanism will allow GEMS to reduce interest rates on its loan offerings to match the reduced risk of customers paying their utility bills. As a result, on-bill is vital to increasing customer savings and reducing interest rates, and will be integrated into GEMS when available.
- **Rental property energy offset mechanism:** Whereas single family homeowners can access and benefit from net energy metering (NEM) to offset energy usage with solar PV production, many multi-unit rental properties are unable to access the benefits of NEM. Without a regulatory pricing structure to allow for such an energy offset, landlords may be limited from installing solar PV on their property to benefit renters.

The HGIA plans to monitor these exogenous challenges to assess their impact on the success of GEMS, and may need to collaborate and pursue other innovative solutions in parallel and in concert with GEMS development and in coordination with the broader evolution of Hawaii's energy ecosystem. The Open Solicitation Process described above will be a critical tool should GEMS encounter insurmountable exogenous challenges in the solar PV sector.

IV. Conclusion

GEMS is a first-of-a-kind financing program in the United States and its effective and timely deployment will serve as a model to other states. With the success of GEMS, Hawaii will further solidify itself as a national leader in clean energy, while delivering the local benefits of energy self-sufficiency, greater energy security, and energy cost reduction to Hawaii's consumers.

In the eighteen months since the signing of Act 211, GEMS has developed in a methodical and targeted manner to ensure quick and effective deployment. Provided that present interconnection challenges can be overcome, GEMS' focus on Solar PV will enable DBEDT to launch GEMS in the first quarter of 2015.

GEMS is market-based and must remain flexible. Future GEMS deployment will provide low-cost capital to overcome market gaps and support additional green infrastructure technologies that will help the State's achievement of its energy goals.