Hawaiian Electric
Maui Electric
Hawai'i Electric Light

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The Guide to Smart Export and Customer Grid Supply Plus

Customers interested in generating their own renewable energy have more choices than ever before when it comes to available programs. The Hawaiian Electric Companies opened two new programs in February: Customer Grid-Supply Plus (CGS Plus) and Smart Export. The programs are in addition to the ongoing Customer Self-Supply (CSS) program and the still-open-but-mostly-subscribed Customer Grid-Supply (CGS) program.

We have a fact sheet for each of the new programs available on our website that contractors can share with customers. While all of the programs share some obvious similarities, the notable differences are important to understand.

The chart below highlights the primary features of each program.

Description	Smart Export	CGS Plus	CSS	CGS*
PUC Tariff/Rule	Rule 25	Rule 24	Rule 22	Rule 23
Eligible renewable resources	All	All	PV only	All
Requires batteries to participate	No, but using batteries make it possible to receive credits for exporting from 4 p.m. – 9 a.m.	No	No, but usually installed	No
Program system size limit	100kW	100kW	100kW	100kW
Credit True-up period	Annual	Annual	N/A	Monthly
Controllability required?	No	Yes	No	No
Allowed to export energy to the grid in return for credits?	Yes	Yes	No	Yes
Grid export compensation window	4 p.m. – 9 a.m. daily	24/7	Export not allowed	24/7
Apply online through the CIT?	Yes	Yes	Yes	No

The availability of sufficient LTE cellular coverage is is no longer a requirement for participation as of PUC Order 35369 issued March 28, 2018. Instead, utilities are required to develop suitable alternatives for customers who can't provide sufficient cell coverage. The cellular coverage is the primary method used by the utility to communicate with the meter. Suitable alternatives for customers who don't have the signal strength necessary to maintain a reliable connection will be determined on a case-by-case basis depending on the situation.

**Customer Grid-Supply remains open until installed capacity is reached. New applications are placed into queue for processing if and when space in the program becomes available. There is no guarantee that space will become available. New applications may be submitted via mail and are not supported in the Customer Interconnection Tool.*

Renewable Program Rates and Capacity

The Hawai'i Public Utilities Commission has established unique credit rates and capacity amounts for each program on each island. The rates are based on the utility's avoided cost of the energy. Avoided cost is a utility term that refers to the cost a utility would have incurred if it had to generate or purchase power from another provider.

Since cost structures and available circuit capacity vary by island and service area, the rates and program capacity also vary. Customer Self-Supply is not shown in the tables below since the program does not have either a credit rate or a capacity limit.

The credit rates are fixed through October 20, 2022 and are subject to change after that date.

Hawai'i Island			
	Smart Export**	CGS Plus	CGS*
Credit Rate in cents per kWh	11.0	10.55	15.14
Program Capacity	5 MW	7 MW	9.91 MW

Lanai			
	Smart Export**	CGS Plus	CGS*
Credit rate in cents per kWh	20.79	20.89	27.88
Maui Island			
	Smart Export**	CGS Plus	CGS*
Credit Rate in cents per kWh	14.41	12.17	17.16
Molokai			
	Smart Export**	CGS Plus	CGS*
Credit Rate in cents per kWh	16.64	16.77	24.07
Maui County			
Program Capacity	5 MW	7 MW	14.1 MW

** Total CGS capacity includes unused amount transfered from Net Energy Metering program as of 10/21/2017.*

Oahu			
	Smart Export**	CGS Plus	CGS*
Credit rate in cents per kWh	14.97	10.08	15.07
Program Capacity	25 MW	35 MW	51.31MW

*** Smart Export credit is only applied to energy exported from 4 p.m. - 9 a.m. Energy exported to the grid during the hours between 9 a.m. - 4 p.m. is not eligible for credit.*

Understanding the CGS Plus aggregator option

Utility controllability is a new program feature that has been incorporated into CGS Plus.

Controllability means that we have the ability to remotely turn-off CGS Plus systems if we need to maintain grid stability and turn them back on when it's safe to do so. The Hawai'i Public Utilities Commission allows this to take place as long as systems are curtailed as a group and only after almost every other curtailable resource has been turned off.

Realistically, curtailment under these conditions will be rare, but possible. Customers have two choices when it comes to the provider of these services: A third-party aggregator that performs the service on behalf of the customer, or the utility itself.

We are collaborating with prospective third-party aggregators to develop the communications and control capability option. We filed our proposed requirements with the PUC for approval on May 31, 2018.

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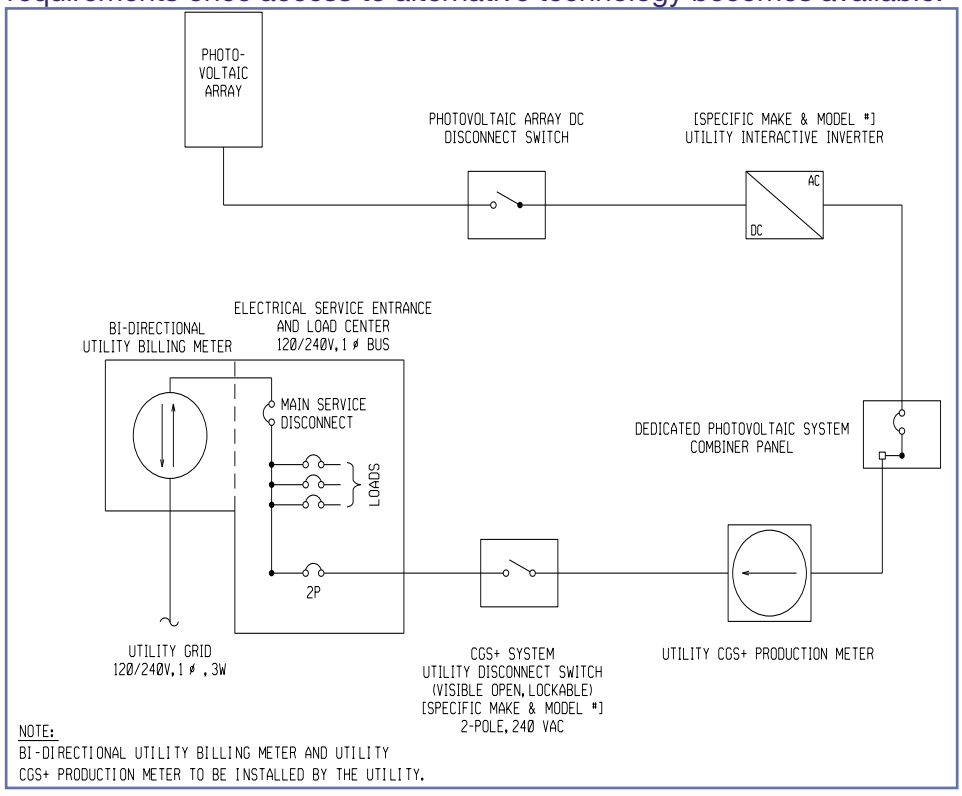
Aggregator Option *continued*

The utility option uses a smart meter (in addition to the net meter) that uses Verizon's Grid Wide hosted platform. The LTE cellular connectivity and throughput speed can be measured prior to deployment by using built in software toolkits with Verizon LTE mobile devices.

LTE connectivity will be deemed acceptable using either a bandwidth test or a signal strength test. The bandwidth test only determines acceptable connectivity, not the minimum throughput required for operation of the smart meter option. Sites that don't pass the bandwidth test may undergo a signal strength test and shall be deemed acceptable with minimum readings of -110 dBm RSRP and an RSRQ of -12 or better.

As needed, utility personnel will determine and record official cellular connectivity tests prior to the installation and operation of the meter at the production meter socket location indicated on the site plan included with the application. After the meter is installed, utility personnel will verify the meter is successsfully communicating with the Verizon Grid Wide platform.

In the event a customer location doesn't meet the minimum performance threshold for cellular connectivity, the companies will determine if acceptable non-cellular alternatives are available to establish the connectivity levels sufficient to satisfy the Communications and Controls requirements. If the remote control of the facility is not immediately possible through any methods, the customer will need to install a second meter socket so that the system is made ready to comply with the requirements once access to alternative technology becomes available.



Here's the diagram showing the minimum requirements for installation of a second meter socket used in the utility's second meter option. We're here to help answer questions that you may have when designing this into the system.

Ten facts about the new programs you may have missed:

1. The second meter socket is necessary for systems that use the utility option or that don't have acceptable LTE connectivity.
2. The customer is responsible for any and all costs related to the use of a third-party aggregator.
3. Customers may still participate in the new programs even if cellular service is not available.
4. Aggregator requirements for third-party providers were filed for approval with the PUC at the end of May.
5. Systems located on O'ahu that will be ready for validation before PUC approval of third-party aggregator requirements may still be approved in limited circumstances in compliance with PUC-approved requirements.
6. The new programs use Aclara 1210+c and kV2c smart meters.
7. The smart meters only support Verizon LTE and are not backwards-compatible with 3G networks.
8. Sites without acceptable LTE connectivity shall install a second meter socket to allow for a seemless transition when the technology becomes available.
9. The minimum acceptable bandwidth requirement for initial connectivity testing is 1.0 Mbps download and 0.5 Mbps upload.
10. We're always available and happy to help with any questions about the new programs.

Understanding ESS Definitions

The Smart Export and Customer Self-Supply programs highlight the growing role of energy storage systems in PV rooftop system designs. The Customer Interconnection Tool requires contractors to select the operating mode that corresponds to the design. Here's a brief explanation of how those operating modes are defined and how they correspond to the Technical System Size.

ESS Operating Mode	Definition	Technical System Size - Daytime	Technical System Size - Nighttime
Uncontrolled ESS Charge/ Discharge [Uncontrolled Export (Coincident with PV)]	While the Generating Facility is Interconnected to the grid, the ESS is capable of discharging power at any time, regardless of whether the renewable generator is producing power.	DC coupled design - Lesser of (sum of Program System Size and ESS kW DC) or (Inverter(s) kW AC) AC coupled design - Sum of (Program System Size and ESS System Size)	ESS System Size
Coincident Discharge with Renewable Generator [Digital Control Export (Coincident with PV)]	While the Generating Facility is Interconnected to the grid, the ESS is capable of discharging power at any time, through the use of software or other controls, regardless of whether the renewable generator is producing power (e.g., the battery may discharge simultaneous to the output of PV energy).	DC coupled design - Lesser of (sum of Program System Size and ESS kW DC) or Inverter kW AC AC coupled design - Sum of (Program System Size and ESS System Size)	ESS System Size
Non-Coincident Discharge with Renewable Generator [Digital Control Export (Non-coincident with PV)]	While the Generating Facility is Interconnected to the grid, the ESS can discharge power only if the renewable generator is not simultaneously producing power (e.g., software controls are employed to ensure that the ESS does not discharge power at any time while the renewable generator is also producing power).	Greater of the (Program System Size or ESS System Size)	ESS System Size
Non/Momentary Parallel or Emergency Back-up Only [Digital Control Battery backup]	The ESS will only discharge power to customer loads during Momentary Parallel or Non-Parallel Operation with the grid	Program System Size (ESS does not affect Program System Size)	None

Additional notes:

- *Program System Size - Lesser of the (sum of all DER generation kW DC) or (sum of Inverter(s) kW AC)*
- *ESS System Size - Lesser of (sum of ESS kW DC) or (sum of Inverter(s) kW AC)*
- *If non-export controls are used during day time period for Smart Export, in compliance with CSS (Rule 22), then DER System will be treated like a CSS system during the day time period during technical review.*
- *Other renewable generation sources such as wind may increase the nighttime Technical System Size. PV will not increase the nighttime Technical System Size.*
- *In general, the Technical System Size is calculated as the maximum power that may be produced at any given time. In some instances, software controls may be implemented to increase or decrease the Technical System Size as calculated per this table.*

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