Meeting Name	Date of Meeting
Microgrid Services Tariff Working Group Meeting	November 21, 2019

Agenda

Introduction / Nov. 14 PUC Status Update - Feedback	• WG lead requested WG members to provide feedback on future meeting agendas/plans during the meetings. • No comments or clarifications from WG received regarding feedback on Nov. 14 PUC status update meeting.

MGS Tariff Microgrid Types	• WG members raised issue of what constitutes a customer MG? Does back-up generation? What if a customer MG doesn't provide grid resiliency to other customers outside of the MG boundary? These need to be considered to avoid unintended consequences, such as where customers that have backup power would not fall under the tariff (e.g., hospitals that have generators)
	  ○ Due to discussion regarding "Resiliency", PUC suggested the term "Resiliency" for this docket should be focused on "emergency conditions" and "outages.
	  ○ WG discussed value of addressing "synchronizing" MGs in tariff due to interconnection considerations, but excluding non-synchronizing simple customer MGs from MST is already possible.
	  ▪ No Rule14H changes and no grid "resilience" benefit during outages/emergency conditions for simple customer MGs.
	  ○ [Action Item] WG Leads to modify Customer MG definition to clarify use of "resiliency" and align with PUC D&O.
	• Hybrid MG Examples (Slide 8) – WG Lead clarified there are no current Hawaii examples. Keahumoa Place Affordable Housing and Century West Condominium developments do not fit the Hybrid MG definition.

Applicable IEEE Standards (presented by Annabelle Pratt)	• IEEE 2030.7 – Standard for a Specification of Microgrid Controllers.
	  ○ Provides a standard for MG controllers, not the MG itself and the functions to operate the microgrid and the utility interfaces for operational information and controls. Utility interconnection rules may require MG controllers to be IEEE 2030.7 compliant with respect to the utility interface functions, but not necessary the MG functions.
	  ○ Standard specifies transition and dispatch functionalities. Relies on voltage/frequency control, real/reactive power control, and device specific functions of other devices within the MG in order to meet the control system standard.
	  ○ Functional requirements include resynchronization.
	• IEEE 2030.8 – Standard for Testing of Microgrid Controllers

	• Interconnection rule change & an interconnection agreement required between MG operator and Utility for synchronizing MG.
	  ○ MG controller and a resynchronizing switch/breaker is needed to resynchronize with the grid.
	  ○ Utility responsible to set conditions for reconnection/synchronization parameters.

Princeton U. Microgrid (presented by Ted Borer)	• Topics to address in an interconnection agreement
	  ○ Federal declaration of a Qualified Facility
	  ○ How power is exported and how much the MG Operator is paid for export of power
	  ○ How the MG is connected to the utility grid
	  ○ Communication between the MG and utility
	  ○ Permitted Power Quality the MG may operate in
	  ○ How the MG operator and utility measure power generated and meters calibrated
	  ○ Boundaries of ownership
	  ○ Things the MG must do to protect the utility grid from damage (protective relays, circuit breakers, etc.)
	  ○ What the MG operator pays for because the utility needs to modify its system in ways that uniquely benefit the MG
	  ○ What the MG operator needs to pay the utility for them to maintain assets and capacity when MG equipment is out of service (e.g., during maintenance)
	  ○ Identifying responsible party when there is a failure, damage
	  ○ Interconnection agreement took about 18 months to complete
	• Discussed the operations of the Princeton MG during Hurricane Sandy
	• Retail Wheeling: Princeton's MG does not use utility wires to move power around campus.
	• When Princeton's cost to generate electricity is lower than the wholesale price of electricity (capacity and/or grid service), Princeton's MG is able to export energy for sale. Excess energy is exported and sold into PJM market and compensated at the real-time LMP price.

Customer Microgrid Interconnection	• [Action Item] WG leads to provide draft version of tariff(s) that would address the Customer MG configuration.
	  ○ WG agreed simple customer MGs (<100 kW) would be defined in the MG Tariff, with reference to existing tariffs/programs that allow these MGs (e.g., CGS+, CSS, Smart Export).
	  ○ WG agreed simple customer MGs (100kW+), and synchronizing customer MGs (any size) would require an interconnection agreement with the utility.

	• WG considerations in development of the MG Tariff
	  ○ Changes to Rule 14H regarding synchronizing MGs (incl. IEEE 2030.7 considerations)
	  ○ Define responsibility of MG parties
	  ○ Point to existing rules and tariffs
	  ○ Define how emergency and outage situations are treated
	  ○ Provide guidelines for safety and reliability
	  ○ Define backup power to meet defined emergency and outage conditions
	  ○ Are penalties considered for MGs that island when the grid is expecting it to be grid-connected?
	  ○ Does utility decide or customer decide to island? Who has control of MG?
	  ○ Should utility provide the MG permission to disconnect/reconnect?
	• WG members raised question about interconnection costs. If MG serves other critical customers, considerations should be made for utility/ratepayers to cover interconnection costs.

Hybrid Microgrid Services Tariff	• WG Considerations
	  ○ Need to consider utility infrastructure used in MG (and compensation)
	  ○ Should the MG operate in reactive or proactive mode?
	• WG in agreement with questions to discuss at Dec. 3 meeting.

Parking Lot Topics to Date (New Topics in Red)	• Change of ownership
	• Standby Charges
	• Customer protection-related considerations
	• Microgrid/IGP procurement considerations
	• Considerations of gaming between utility-owned and 3rd-party MGs
	• Army/Military MG issues such as WG will consider nested microgrids, if appropriate
	• Interactions with other dockets
	  ○ DER Tariff/Programs
	  ○ IGP Resiliency
	• Consideration of societal, environmental value
	• Development of PPA model for hybrid MGs
	• Other types of microgrids that don't fit Act 200 definition
	• Puerto Rico microgrid ruling and related activity and relevance to Hawaii

Working Group Chairs:		
Marcey Chang, DCCA	Chair, Market Facilitation and Interconnection WG	mchang@dcca.hawaii.gov
Marc Asano, HE	Chair, Interconnection WG	marc.asano@hawaiianelectric.com
Ken Aramaki, HE	Chair, Market Facilitation WG	ken.aramaki@hawaiianelectric.com

Attendees:		
Alan Hirayama, HE	Henry Curtis, Life of the Land	Peter Yuen, NACFAC HI
Alan Lee, HE	Henry Lee, HE	Rich Barone, HE
Anand Samtani, PUC	Jared Leader, SEPA	Riley Ceria, HELCO
Andrew Barbeau, The Accelerate Group	Jay Griffin, PUC	Robert Pylartz, HE
Andrew Okabe, PUC	Kandice Kubojiri, HELCO	Rod Aoki, RSA Law
Annabelle Pratt, NREL	Keith Yamanaka, USAG-HI	Russ Koehler, MCBH
Baird Brown, eco(n)law LLC	Ken Aramaki, HE	Shereen Wachi, NAVFAC HI
Brian Levite, S&C	Kevin Katsura, HE	Sonny Rasay, MCBH
Bryant Komo, HELCO	Lisa Dangelmaier, HELCO	Steven Sano, HE
Christopher Lau, HE	Lisa Hiraoka, DCA	Stewart Chong, HE
Colton Ching, HE	Liza Jang-Che, HE	Susan Char, HE
Craig Nakanishi, Cades Schutte	Marc Asano, HE	Ted Borer, Princeton U.
Dean Nishina, DCA	Marcey Chang, DCA	Ted Robinson, USAG-HI
Earlynne Maile, HE	Natalia Lagmay, HE	Tracie Black, HE
Eaton O'Neill, HE	Nohealani Hirahara, HE	Troy Uyehara, HE
Eric Kunisaki, HE	Olivia Simpson, HE	Will Rolston, Energy Island
Gerald Sumida, Carlsmith	Paul De Martini, Newport Consulting	Yoh Kawanami, HE
Gina Yi, PUC	Peter Young, HE	

Customer Microgrid MGS Tariff

Revised framework to identify specific topics and priorities for WGs' discussion

MG Type	Tariff Structure	Rule 14H & Process Chgs	Energy & Grid Services	Resilience Services	Retail Wheeling	Other
Customer Microgrids	**Portal Type Proposed**	**Minor Changes** (IEEE/UL microgrid safety standards)	**Yes** (Via Existing Pricing, Programs & Procurements)	**Parties to Propose per PUC Order 3641***	**N/A**	**TBD**
	• WG Agreed to develop a new MG tariff. • Tariff will include definitions of customer/synchronizing/hybrid MGs. • New Tariff will reference existing tariffs (e.g., CGS+, CSS, etc.)	• What changes may be needed, if any to Rule 14H? WG Leads/HECO team to propose. • Customer MGs that synchronize reconnection to utility grid after event may need to comply with IEEE 2030.7 and other standards TBD • Operating Agreement needed for Synchronizing Customer MG? Yes, but will be developed specific to each MG.	• Export compensation will be through existing and new DER tariffs. • All MGs capable of participating in future Grid Svcs.	• PUC Order initial priority is to facilitate applications of MGs that improve energy resiliency, particularly the islanding of MGs during emergency events and grid outages.	• WG agreed N/A.	• WG agreed no other issues.

*Updates from Nov. 21 discussion denoted in red