2018-0163

Microgrid Services Tariff
Working Groups Status Update

November 14, 2019

Background

Date	Action	Comments
August 20, 2019	PUC Order No. 36481 Issued	
September 12, 2019	Procedural Order No. 36514 Issued	
September 19, 2019	PUC Technical Conference	• Provided guidance on priorities, expectations, and schedule for WGs
October 3, 2019	MST WG Webinar Kickoff	• Formation of WG, WG Leads • Review of MST Objectives • Proposed Framework/Timeline
October 14, 2019	MST WG Symposium	• Insights from Illinois and DC • Proposed MG Architectures, Framework • Re-assessment of Microgrid Types and Framework required
November 5, 2019	MST WG Webinar	• Customer and Hybrid Microgrids defined and accepted as architectures to address • WG in agreement on topics to address for Customer MGs (Nov. 21)

Modified Slides from Nov. 5 Webinar

Proposed MG Types for MGS Tariff

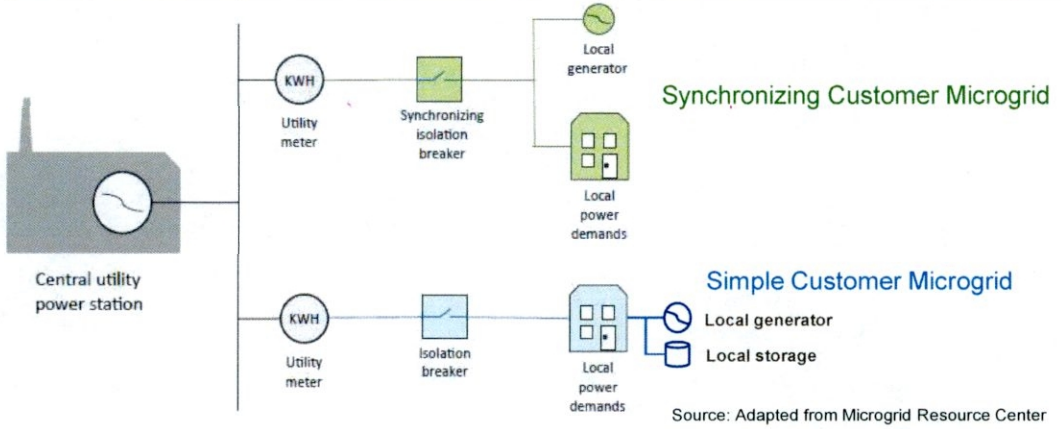
- **Customer Microgrids**
  - Customer microgrids are self-governed, acting as a single controllable entity normally operated in utility grid-connected mode and can disconnect from the grid to operate in island mode for resiliency.
  - Customer microgrids are downstream of a point/s of common coupling (PCC) with an electric utility utilizing either (i) own, (ii) lease or otherwise obtain use of non-utility distribution wires and other internal infrastructure of the microgrid from non-utility third parties.
- **Hybrid Microgrids**
  - ~~3rd Party~~ Hybrid microgrids developed by customers/3rd parties acting as a single controllable entity with respect to the utility's electrical grid normally operated in grid-connected mode and can operate in an island mode for resiliency within clearly defined electrical boundaries linking associated resources and loads ~~within their micro-control area~~ using utility distribution wires or other utility infrastructure.

Nov 5th WG Concurrence for working definitions subject to further refinement as needed

Customer Microgrid Types

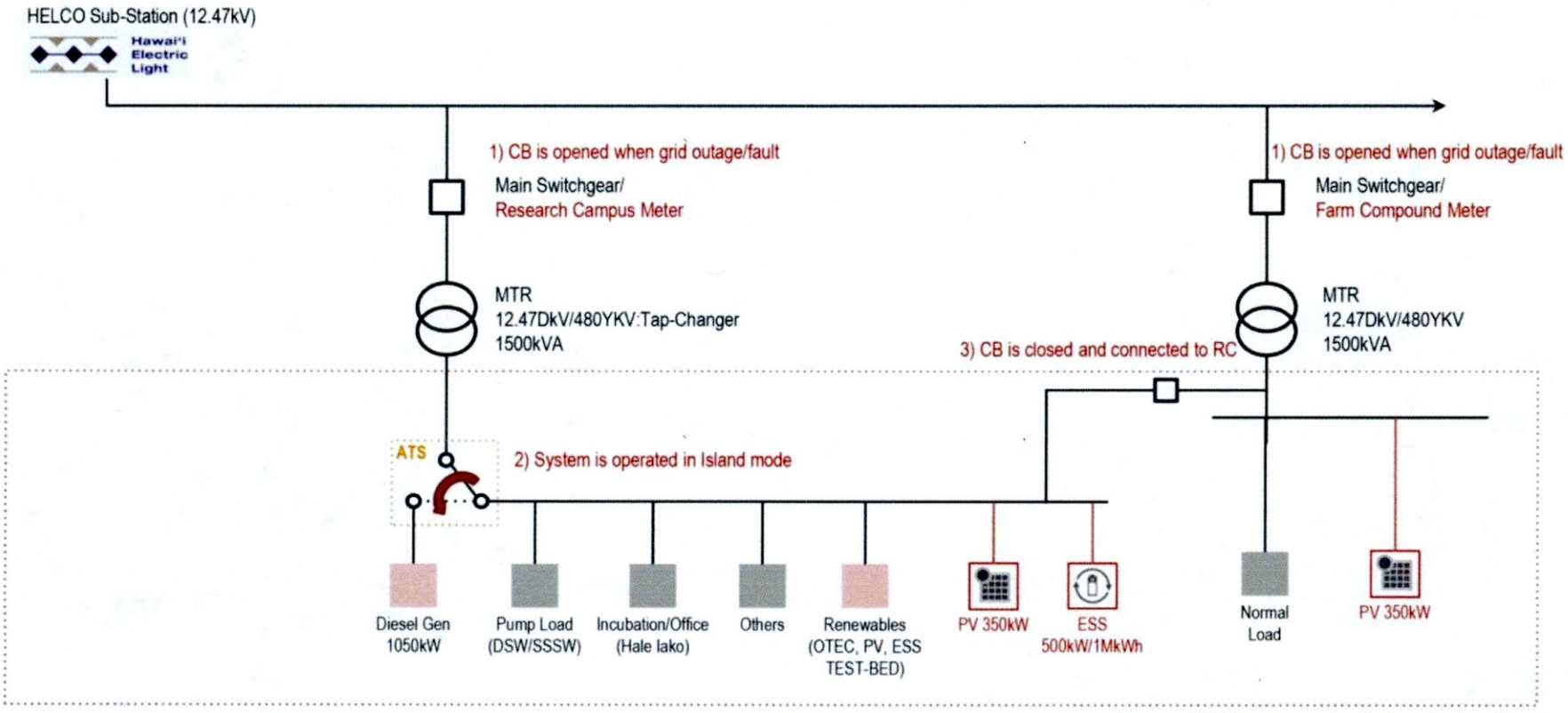
Nov 5th WG Request for discussion Nov 21st

Customer MG Types	Hawaii Examples	Interconnection Considerations	Tariff Considerations for WG Discussion
Simple Customer Microgrids that disconnect on grid outage via an isolation breaker and requires "drop & pick-up" of load when reconnecting to grid	Kalaeloa, Kaimana, Mahana and Makai Apartments	This type doesn't require any changes to Rule 14H	WG idea of a potential creation of a "portal" tariff that provides a gateway to other relevant DER tariffs and interconnections
Synchronizing Customer Microgrids that seamlessly island on grid outage and reconnects via a synchronizing isolation breaker after grid is restored	Univ. of Hawaii (see slide)	IEEE 2030.7 and 2030.8 relating to standards and testing procedures for microgrid controllers	Interconnection facilities are specialized to accommodate synchronized interconnection, may need operating agreement for safe coordination



Source: Adapted from Microgrid Resource Center

NELHA Microgrid (2nd Step Configuration)

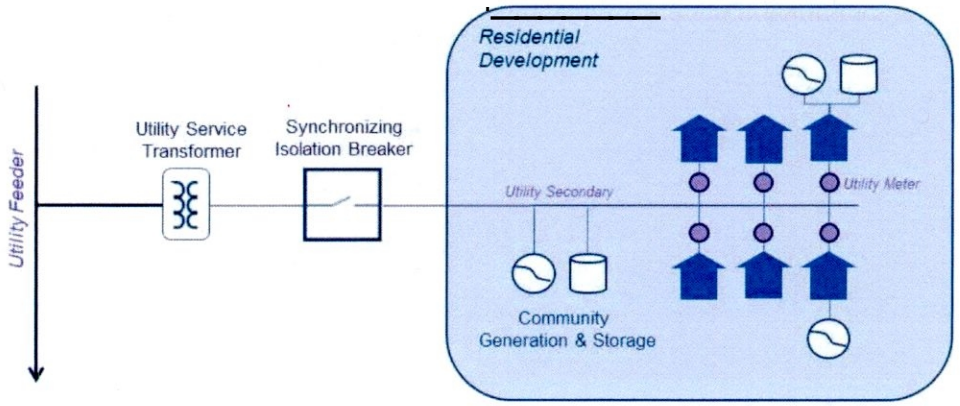


Source: HNEI Presentation HPUC TC Jan 2019

Hybrid Microgrid Example: Simple Hybrid MG

Nov 5th WG Request for discussion Nov 21st

- **Simple Hybrid Microgrid** involves a smaller geographic area with a simpler electrical boundary, such as a defined residential community/industrial park/commercial retail center.
- A single entity representing all customers involved with microgrid, such as a home owners association, property manager, etc.
- Contiguous loads and resources within a section of a distribution feeder (primary and or secondary) that allows a single point of common coupling and relatively simpler operational coordination to ensure safety and operational effectiveness.



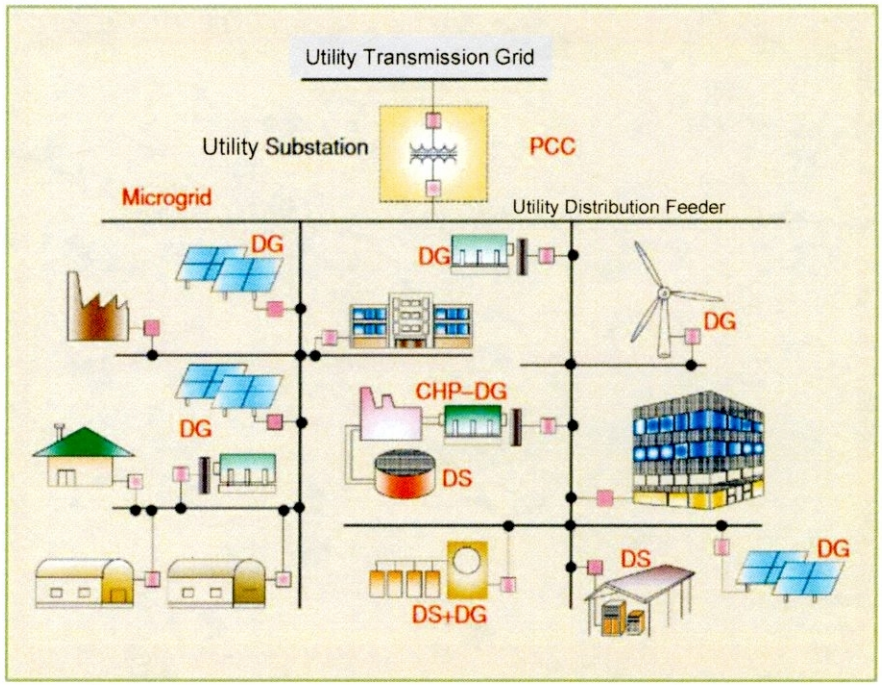
Hawaii examples:

- Keahumoa Place Affordable Housing
- Century West Condominium

Hybrid Microgrid Example: Mini-grid

Nov 5th WG Request for discussion Nov 21st

- **Mini-grid Hybrid Microgrid** involving a 3rd party microgrid operator operating a multi-user microgrid on behalf of itself and/or one or more microgrid participants to meet operational, environmental, reliability, resiliency and redundancy goals of the participants, managing both purchases from and sales of services to the grid. It will manage the microgrid in island mode.
- This mini-grid configuration involves linking various customer and 3rd party resources across utility distribution grid to supply energy to all customers within the electrical boundary.
- In the graphic, the electrical boundary (point of common coupling – PCC) is the distribution feeder breaker at the substation. All loads on the feeder illustrated are within the microgrid.
- This is a relatively complex engineering solution involving significant operational coordination, customer issues and other considerations to operate safely and effectively.



Source: "Microgrids Management" by Katiraei, Iravani, Hatziargyriou and Dimeas, IEEE, 2008

Graphic referenced in BU-NECEC, "Multi-User Microgrids: Obstacles to Development and Recommendations for Advancement", Nov 2018

Microgrid Types Out of Scope for MGS Tariff

Nov 5th WG generally agrees, subject to future discussion in certain areas (e.g., utility/third party microgrid)

Type	Description	Rationale for Not Including
Utility microgrids (e.g., Schofield Generating Station)	Microgrid developed by utility on distribution system that may involve both utility resources (own or contracted) and customer resources providing services.	Utility microgrid related investments are approved through existing regulatory processes.
Remote microgrids	Customer microgrid that is off-grid, not connected to the utility grid in normal mode and unable to connect to the utility grid.	Remote microgrids do not fit Act 200 definition of a microgrid.
Virtual microgrids	Virtual microgrids also known as Virtual Power Plants (VPP) are a set of aggregated resources that can provide grid services under normal operating conditions. Resources are not able to support load within clearly defined electrical boundaries.	Virtual microgrids do not fit Act 200 definition of a microgrid. VPPs already eligible to provide energy and services under existing programs and procurements.

MGS Tariff WGs Scope & Focus Recommendations

Nov 5th WG generally agrees

- Focus MGS Tariff on Customer & Hybrid Microgrids
- Prioritize development of Customer microgrid tariff development first for March draft tariff filing.
- Initiate discussion of Hybrid microgrid tariff issues to minimally frame for a potential second phase given the number of complex issues and lack of time under PUC schedule.
  - WGs considered the input from subject experts working on similar Hybrid microgrid tariffs in Illinois & DC that have worked for a year and still have substantive issues to resolve.

MGS WG Organizing Framework

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

Nov 5th WG generally agrees to use this framework to address the detailed issues in each dimension, subject to future refinement

MG Type	Tariff Structure	Rule 14H & Process Chgs	Energy & Grid Services	Resilience Services	Retail Wheeling	Other
Customer Microgrids	**?**	**Minor Changes** (IEEE/UL microgrid safety standards)	**Yes** (Existing Pricing, Programs & Procurements)	**Parties to Propose**	**N/A**	**?**
Hybrid Microgrids	**?**	**?**	**Yes** (Existing Pricing, Programs & Procurements)	**Yes** (Need service definition & value methodology)	**Yes** (case specific considerations & cost of service study)	**?**

- Initial scoping discussions on each element above have begun – detailed discussion towards proposals for Customer MGs on Nov 21st, Hybrid MGs on Dec 3rd
- No topics proposed yet for "Other" category

Brief Summary of Related Proceedings

- Docket No. 2019-0323 Distributed Energy Resource Policies, includes distributed generation, energy efficiency, demand response, electric vehicles, and distributed energy storage.
  - Topics identified in the Commission's Order No. 36538 Opening the Docket, are as follows:
    - Examining and developing types of new DER programs
    - Advanced rated designs offered to customers
    - Existing DER programs and tariffs
    - Improvements to the interconnection process and technical standards to better facilitate the integration of DER
    - Legacy equipment updates or retrofits
- Docket No. 2018-0165 Integrated Grid Planning, working group meetings are currently on-going
  - https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning
- Docket No. 2018-0135 Electrification of Transportation Strategic Roadmap
  - https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning
- Docket No. 2018-0088 Performance-Based Regulation
- Docket No. 2017-0226 Grid Modernization Strategy
  - https://www.hawaiianelectric.com/clean-energy-hawaii/grid-modernization-technologies/grid-modernization-strategy

WG Discussion of Related Proceedings

- Prioritizing the customer microgrid tariff and subsequently the hybrid microgrid tariff can provide greater transparency for the development of the common type of microgrids in Hawaii.

- Energy & Grid Services:
  - Development of these types of microgrids will allow them to participate in grid services (DER Docket No. 2019-0323)
    - Pricing, procurements, and programs will be linked to the DER Docket and,
    - Grid needs identification and solution sourcing informed by IGP.

- Resiliency Services:
  - Docket No. 2018-0165 Integrated Grid Planning (IGP) – As part of the stakeholder work conducted in the Resiliency Working Group (RWG), priority threats will be identified. The IGP RWG may inform definition as well as potential definition of characteristics that provide broader public benefits.
  - Draft of the report is projected to be available on November 22, 2019, with the final report projected to be completed by December 16, 2019. Information from the report can be used by MGS Tariff Working Group to help develop resiliency services.
  - Part of the next steps of the MGS Tariff Working Group will be identification of resiliency services based on input from Parties and input from the resiliency working group.

Parking Lot Topics To-date

- 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

Draft Agenda for Nov. 21st MGS WG Joint Mtg

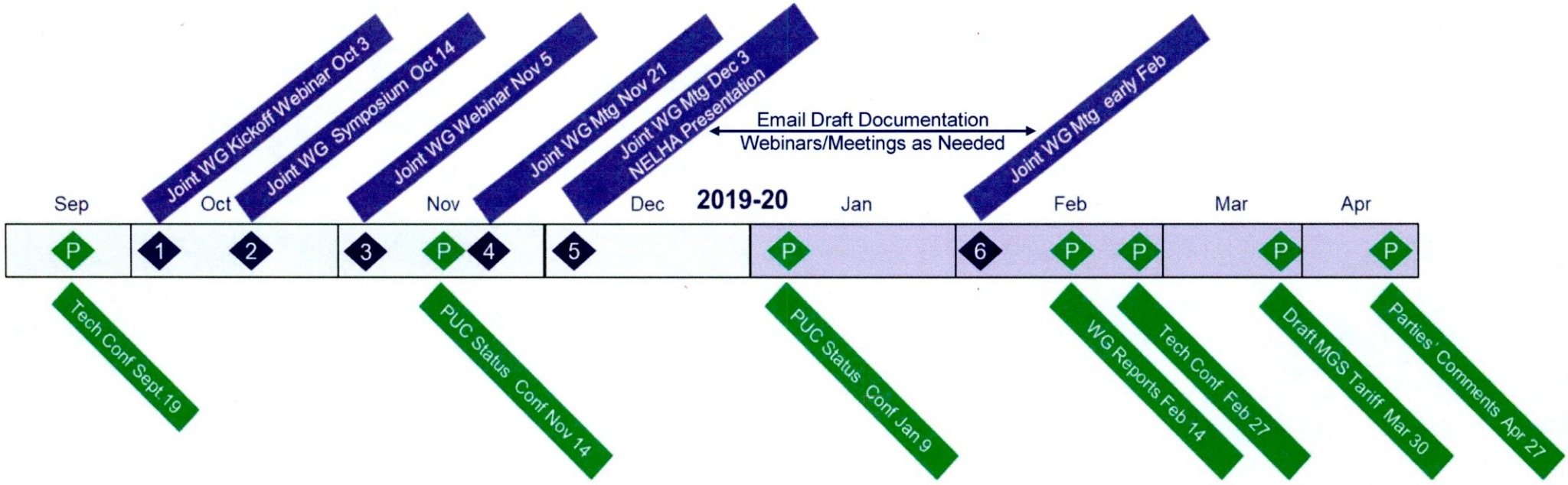
Nov 5th WG agreement

- Introduction
  - Feedback from Nov 14th PUC status meeting
- WG Member Presentation(s)
- Customer Microgrid Tariff
  - Interconnection Changes
    - Applicable Standards (e.g., IEEE 2030.7 and 2030.8 relating to standards and testing procedures for microgrid controllers)
    - Potential process changes
  - MGS Tariff Structure
    - Identify recommended structure
  - Existing Program/Tariff changes
    - Identify recommended changes as needed
  - Other Issues
    - Identified in October WGs Symposium
- Hybrid Microgrid Tariff
  - Identify and prioritize issues to address

Proposed Timeline for MGS Tariff WGs

Adjust as needed based on stakeholders feedback & co-chairs' direction

Nov 5th WG general agreement



Summary

- Agreements/Progress
  - 3 WG Meetings Held
  - Website: https://www.hawaiianelectric.com/about-us/our-vision-and-commitment/resilience/microgrid-services-tariff
  - General Agreement on Definition of Microgrid Architectures in Alignment with PUC's Order
  - WG Framework and Plan to Address Subtopics
- WG Disagreements
  - None