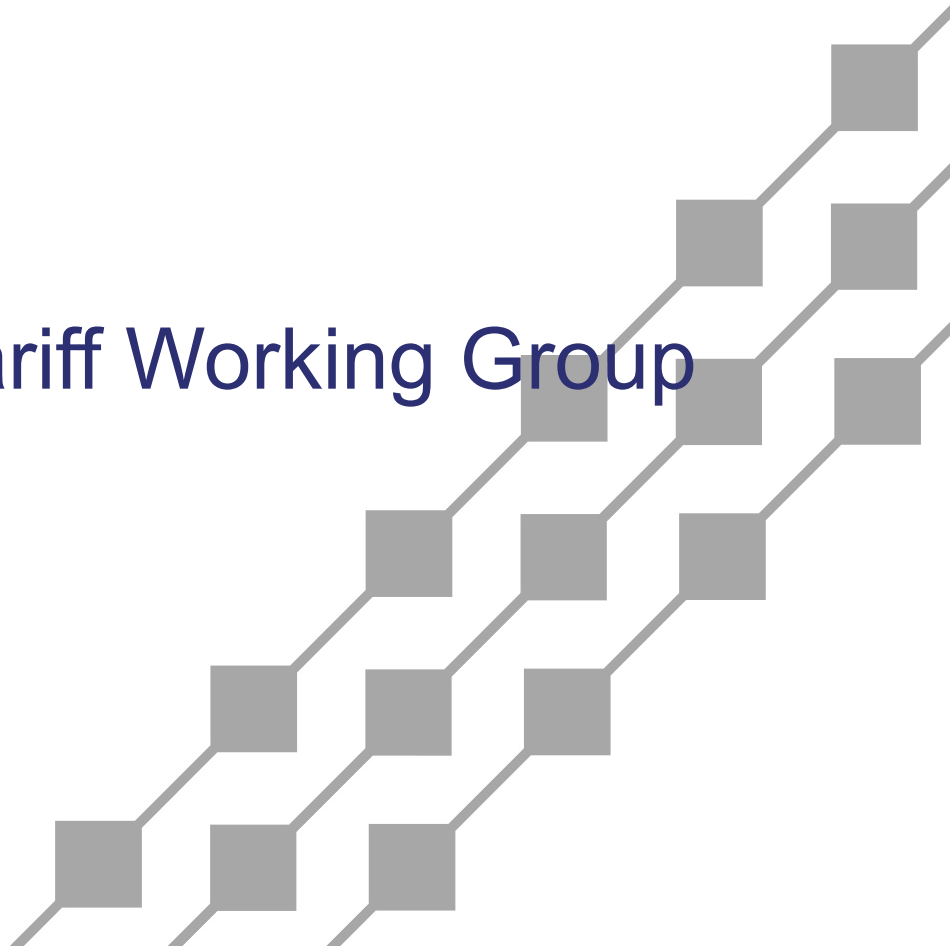




**Hawaiian
Electric**

Microgrid Services Tariff Working Group

February 6, 2020

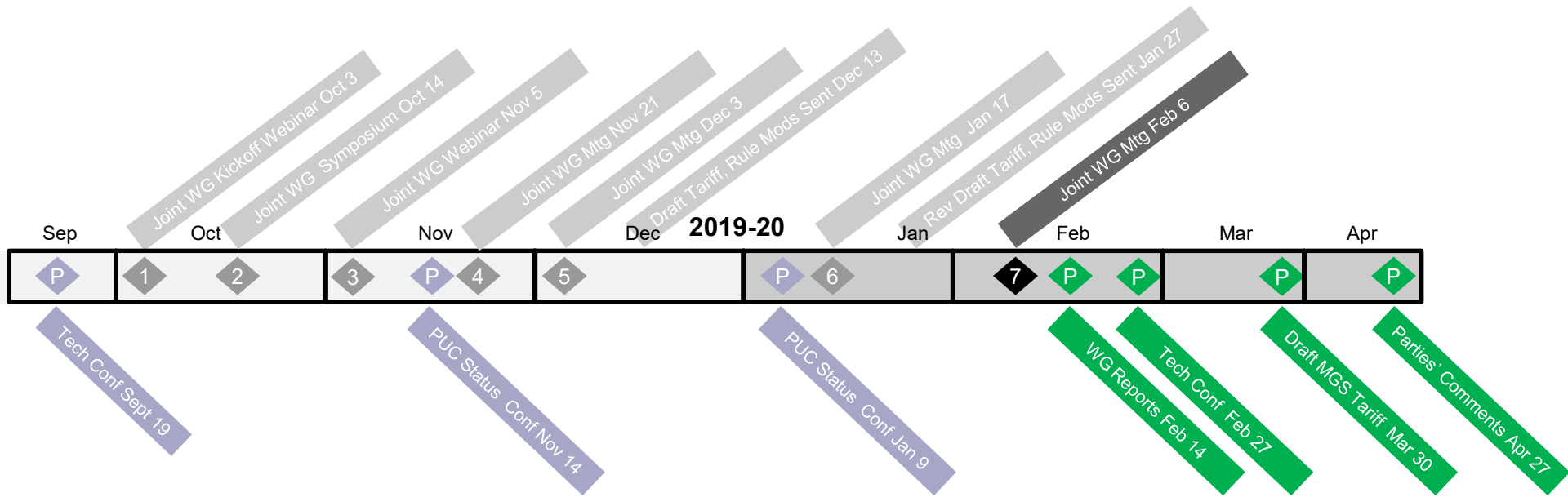


Agenda

Time	Duration (m)	Topic
8:00-8:15	15	Introductions / Timeline
8:15-8:45	30	Review: Scope of Microgrid Services Tariff
8:45-9:30	45	Draft Microgrid Services Tariff
9:30-9:45	15	Break
9:45-10:15	30	Revisions to Rule 14H
10:15-10:45	30	Revisions to Rule 24
10:45-11:00	15	Closing / Next Steps



Timeline for MGS Tariff WGs





**Hawaiian
Electric**

Scope of Microgrid Services Tariff

Sent January 27, 2020

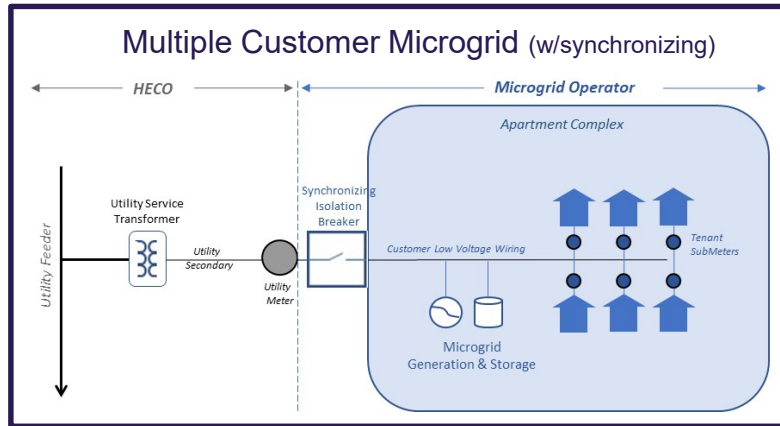
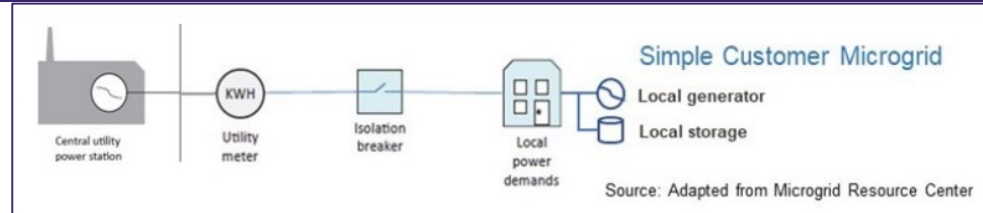


Microgrid Services Tariff Scope

- ◆ Customer Microgrids (examples on slide 6)
 - Single Customer MG
 - Multiple Customer MG (using non-utility assets during emergency)
- ◆ Hybrid Microgrids (example on slide 7)
 - “Simple” Multiple customer MG using utility grid during emergency
 - Note: “Minigrids” Hybrid MGs out of scope for MGS Tariff as too complex for a standard tariff (i.e., PPA-type arrangement would be required) (see slide 12)

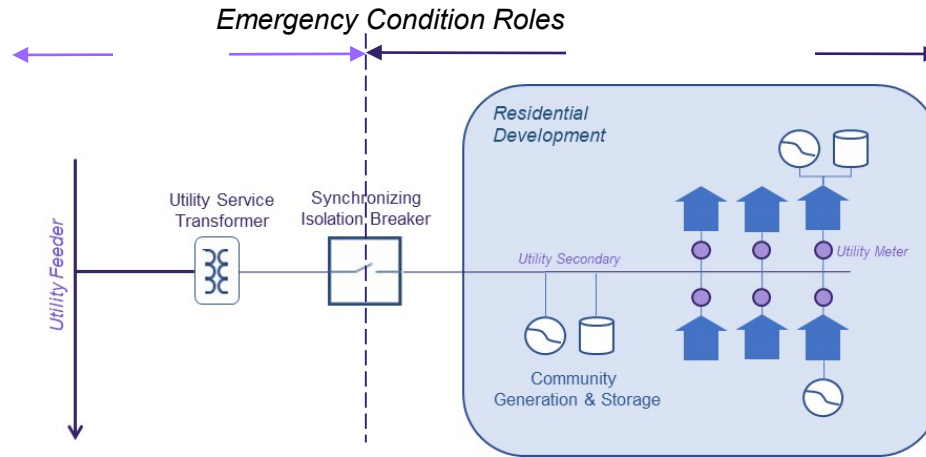


Customer Microgrids Covered under MGS Tariff



“Customer Microgrids” are self-governed microgrids, which involve a Microgrid Facility on the customer-side of the PCC, serving a single customer or multiple customers utilizing non-utility infrastructure through either: (i) own, (ii) lease, or otherwise (iii) use of non-utility distribution wires and other internal infrastructure of the microgrid from non-utility third parties.

“Simple” Hybrid Microgrids Covered under MGS Tariff

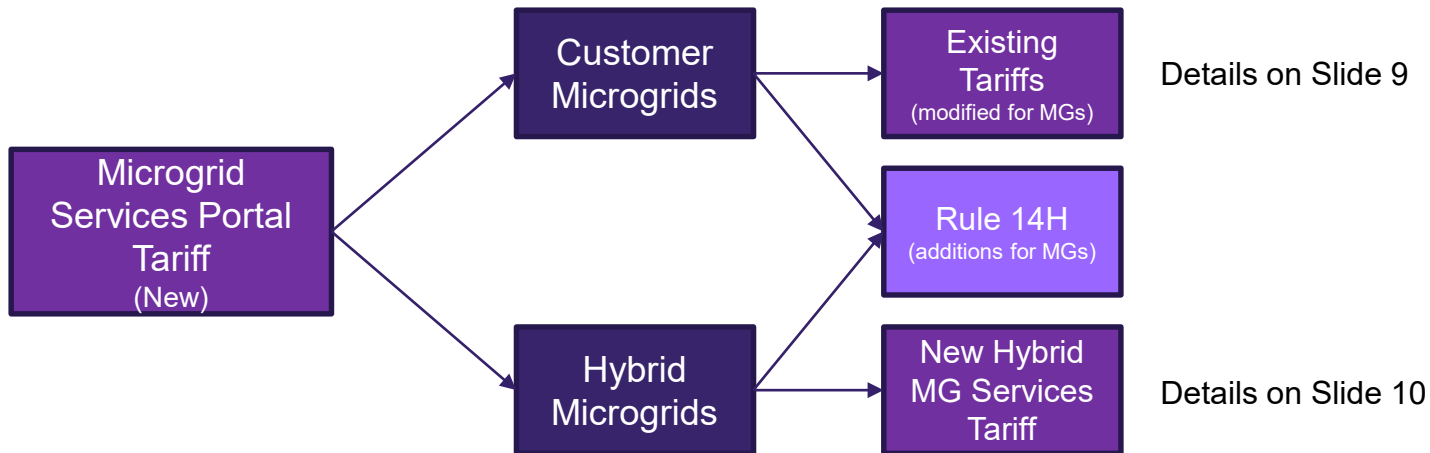


“Hybrid Microgrids” are self-governed microgrids that are developed by customers or third-parties, involving a Microgrid Facility operated by a Microgrid Operator that serves multiple contiguous customers during an emergency within a clearly defined electrical boundary and PCC utilizing utility distribution wires or other utility infrastructure.



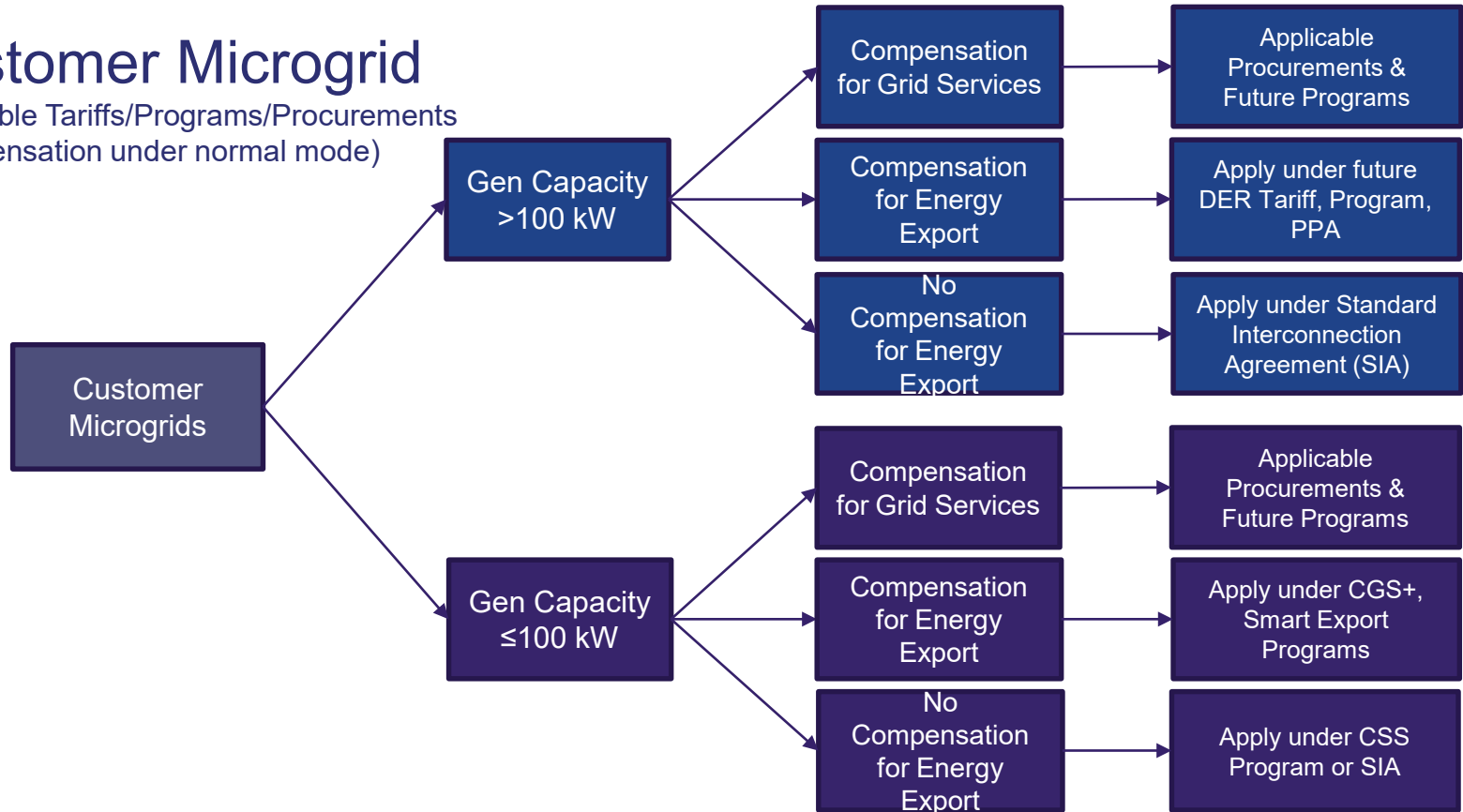
Microgrid Services Portal Tariff

Portal Tariff will provide scope for application, definitions of applicable microgrids & microgrid operator, pointers to applicable existing tariffs/programs for customer MGs and new hybrid microgrid tariff & applicable interconnection requirements in Rule 14H.



Customer Microgrid

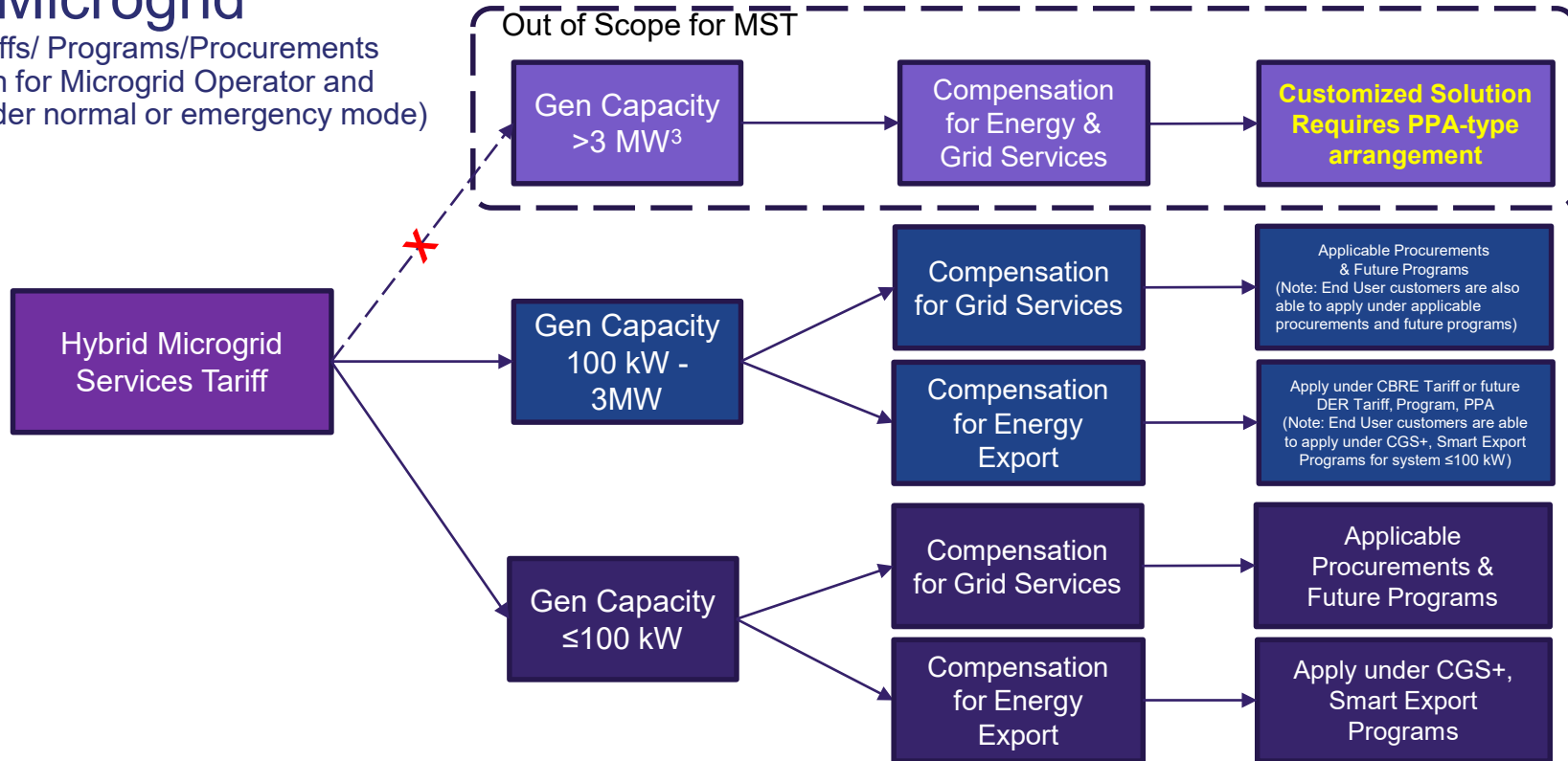
Applicable Tariffs/Programs/Procurements
(Compensation under normal mode)



The above diagram does not show the potential MG Operator compensation by means of a Resilience Service with Hawaiian Electric (e.g., proposal by developer or identified through resilience planning). The Resilience Service compensation in which MG Operator may also independently obtain compensation from MG customers and/or others (e.g., government) for resilience services is shown on slide 11.

Hybrid Microgrid

Applicable Tariffs/ Programs/Procurements
(Compensation for Microgrid Operator and
Customers under normal or emergency mode)

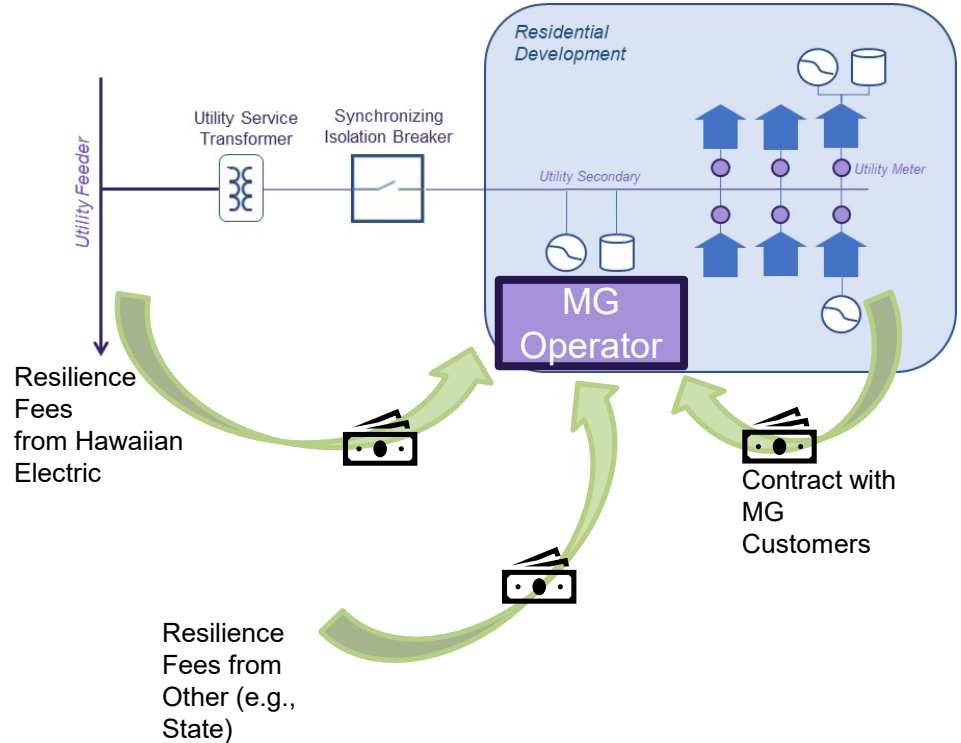


1. Hybrid Microgrids may consist of existing customers (or customer microgrids) under DER Tariffs. "Gross output" applies to the additional DER added during the application of the Microgrid.
2. The above diagram does not show the potential MG Operator compensation by means of a Resilience Service with Hawaiian Electric (e.g., proposal by developer or identified through resilience planning). The Resilience Service compensation in which MG Operator may also independently obtain compensation from MG customers and/or others (e.g., government) for resilience services is shown on slide 11.
3. TBD for Maui, Molokai, Lanai, and Hawaii Island customers.

Hybrid MGS Tariff Compensation for Hybrid Microgrids

Microgrid Services Tariff Sec. D(3)

- In normal/emergency mode, transactions between HECO, Customer, MG Operator remain the same
 - MG Customers pay HECO for electricity, get compensated for production under existing tariffs
 - HECO is paid for electricity used, compensates MG operator and customers for electricity produced under applicable tariffs
 - MG operator compensated for electricity produced under tariff/program
- Resilience or Service fees are an additional layer for MG Operators to be compensated:
 - By Customers – Agreements between MG Operator and Customers
 - By Hawaiian Electric – Proposed Resilience Fee by developer, and/or RFP by HE
 - By Other Entity – Defined resilience or service benefit



Microgrid Types Out of Scope for MGS Tariff

Type	Description	Rationale for Not Including
Mini-grid Hybrid MGs	Mini-grid configuration involves linking various customer and 3rd party resources across utility primary distribution grid with a PCC at the distribution feeder breaker or other point on the primary distribution feeder to form multi-user MG during an emergency.	This is a very complex engineering solution involving significant & unique operational coordination, customer issues and other considerations to operate safely and effectively that cannot be addressed in a standard tariff. A PPA-type arrangement is more appropriate for this type of microgrid.
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.
Utility-Private Partnership microgrids	Microgrid jointly developed through utility - private partnerships which may involve customer or hybrid microgrid architectures.	Utility microgrid related investments and such joint partnerships 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.

Action Items for Working Group Members

- ◆ Review Draft Microgrid Services Tariff
- ◆ Review Rule 14H – Interconnection Requirements
- ◆ Review Rule 24 – Example of changes to existing DER Tariff to include MGs

- ◆ This deck will serve as the basis for WG Report.
- ◆ WG members please submit any comments that should be included in the WG Report on the proposed tariff changes or any alternate proposals that should be included in WG Report.



Expectations of Working Groups

MST Technical Conference – 9/19/19

Working Groups	Tasks	Deliverables	Current Action Items for WG Members
Interconnection Standards	<ul style="list-style-type: none"> Review interconnection standards under existing tariffs Discuss changes to existing interconnection standards to support microgrids and backup power applications Examine examples of interconnection requirements and processes 	<ul style="list-style-type: none"> Draft language modifying Rule 14H regarding interconnection and islanding / reconnection of microgrids 	<ul style="list-style-type: none"> WG Members to review Rule 14H modifications
Market Facilitation	<ul style="list-style-type: none"> Develop MGS Tariff language Consider modifications to existing tariffs or programs Explore new program(s) for microgrid development 	<ul style="list-style-type: none"> Draft MGS Tariff language to enable microgrids that provide backup power during grid outages 	<ul style="list-style-type: none"> Review draft Microgrid Services Tariff
		<ul style="list-style-type: none"> Proposed compensation for use of HECO Companies' distribution system, if necessary 	<ul style="list-style-type: none"> WG members to submit alternate proposals, if necessary
		<ul style="list-style-type: none"> Recommendations to modify existing programs, and/or new programs or services, if necessary, to support microgrid development 	<ul style="list-style-type: none"> Review Rule 24 modifications
		<ul style="list-style-type: none"> Justification for compensation for clearly demonstrated benefits to non-participants, if necessary 	<ul style="list-style-type: none"> WG members to review Microgrid Services Tariff (Sec. D.3) for process to propose compensation, or provide alternate proposals if necessary.

Commission's Determinations for Priority Items

MST Technical Conference – 9/19/19

- ◆ Standardize interconnection process and requirements (Rule 14H, and Microgrid Tariff if necessary)
- ◆ Review/revise existing DER programs as needed to facilitate microgrid development
- ◆ Develop Microgrid Tariff to provide a pathway to enable microgrids to support resilience during grid outages



Draft Tariff and Rule Modifications



Draft Microgrid Services Tariff

- ◆ Revisions to make prior to WG Report?
- ◆ WG Members to provide written comments by Feb. 12 for incorporation into the report
- ◆ WG Members to provide alternate proposals for compensation by Feb. 12 for incorporation into the report



Proposed Revisions to Rule 14H

- ◆ Revisions to make prior to WG Report?
- ◆ WG Members to provide written comments by Feb. 12 for incorporation into the report



Proposed Revisions to Rule 24

- ◆ Revisions to make prior to WG Report?
- ◆ Discuss C. Debone's comment
- ◆ WG Members to provide written comments by Feb. 12 for incorporation into the report

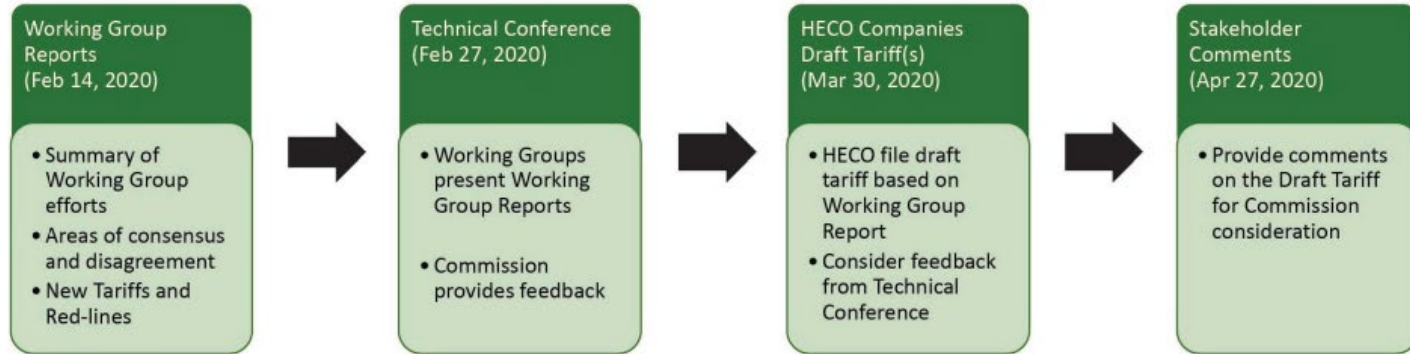


Parking Lot Topics To-Date

- ◆ Change of ownership of Microgrid
- ◆ Standby Charges or Exit Fees
- ◆ 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
- ◆ Gap in tariff for customers greater than 100kW participation & compensation in non-normal, non-island scenarios. Eg, SIA
- ◆ Harmonize compensation with other grid service mechanisms
 - Expanded functionality from MG service and whether should be included in MST.
- ◆ Contractual obligations for other grid services – Customers with existing DER/DR obligations still need to meet performance if included in a MG.
- ◆ Customer approvals – Does a Hybrid MG need a full customer subscription?



Next Steps



Feb 14 WG Report

- Meeting Minutes **[WG Leads]**
- WG Meeting Presentations **[WG Leads]**
- Summary **[WG Leads]**
- Current draft tariff, Modifications to Rule 14H and Rule 24 **[WG Leads]**
- **[WG Members]** to provide written comments, alternative proposals by Feb. 12
 - Submit via email to ken.aramaki@hawaiianelectric.com





Mahalo for your time.

