



# **Microgrid Services Tariff Working Groups Joint Meeting**

*December 3, 2019*



**Hawaiian Electric  
Maui Electric  
Hawai'i Electric Light**

# MGS Tariff WGs Agenda

Time	Duration (m)	Topic
8:00-8:30	30	Introduction <ul style="list-style-type: none"> <li>Review of Nov. 21 Meeting</li> </ul>
8:30-9:00	30	Presentations <ul style="list-style-type: none"> <li>Jorge Camacho – Puerto Rico</li> </ul>
9:00-9:15	15	Break
9:15-10:15	60	Hybrid Microgrid – Interconnection Considerations
10:15-10:30	15	Break
10:30-11:15	45	Hybrid Microgrid – Simplified Tariff Concept
11:15-12:15	60	Lunch Break (on your own)
12:15-1:15	60	Hybrid Microgrid – Tariff Considerations
1:15-1:45	30	Schedule and Next Steps



# Review: Nov. 21 WG Meeting

## Customer Microgrids



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# 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 **during emergency events or grid outages** ~~for resiliency~~.
- ◆ Customer microgrids may involve a single customer or multiple customers 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

- ◆ 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 **during emergency events or grid outages** ~~resiliency~~ within clearly defined electrical boundaries linking associated resources and loads using utility distribution wires or other utility infrastructure.



# 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	<b>Portal Type Proposed</b>	<b>Minor Changes</b> (IEEE/UL microgrid safety standards)	<b>Yes</b> (Via Existing Pricing, Programs & Procurements)	<b>Parties to Propose per PUC Order 3641*</b>	<b>N/A</b>	<b>TBD</b>
	<ul style="list-style-type: none"> <li>WG Agreed to develop a new MG tariff.</li> <li>Tariff will include definitions of customer/synchronizing/hybrid MGs.</li> <li>New Tariff will reference existing tariffs (e.g., CGS+, CSS, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>What changes may be needed, if any to Rule 14H? WG Leads/HECO team to propose.</li> <li>Customer MGs that synchronize reconnection to utility grid after event may need to comply with IEEE 2030.7 and other standards <b>TBD</b></li> <li>Operating Agreement needed for Synchronizing Customer MG? <b>Yes, but will be developed specific to each MG.</b></li> </ul>	<ul style="list-style-type: none"> <li>Export compensation will be through existing and new DER tariffs.</li> <li>All MGs capable of participating in future Grid Svcs.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>WG agreed N/A.</li> </ul>	<ul style="list-style-type: none"> <li>WG agreed no other issues.</li> </ul>

\*Updates from Nov. 21 discussion denoted in red



# Presentations



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# Jorge Camacho, IEEE

## Puerto Rico Update



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# Hybrid Microgrid Tariff Considerations

*(sample\* to start WG discussion)*

## ◆ Customers

- ◆ Request Process: Establishment of a process for a customer to opt-in to a Hybrid Microgrid.
- ◆ Determination of Payment: The method of payment by the customer to Hybrid Microgrid Operator.
- ◆ Quality of Service: What are the Hybrid Microgrid operator's obligations for provision of service to customers.
- ◆ Free-Riders: How do you deal with customers within a microgrid footprint but not willing to pay?

## ◆ Resilience Benefits

- ◆ What public resilience benefits do Hybrid Microgrids provide under various cyber and physical threats?
- ◆ How are any resilience benefits determined and estimated?
- ◆ Who pays for identified resilience benefits?

## ◆ Hybrid Microgrid Configuration:

- ◆ Eligible Services or Facilities: The type, extent and location of hybrid microgrid services/equipment needed.

## ◆ Hybrid Microgrid Interconnection Facilities:

- ◆ Equipment: What are the standard facilities the utility may need to install to enable the project?
- ◆ Determination of Cost: The net cost to the Hybrid Operator/Developer for the grid services/equipment required.
- ◆ Independent Review: Allow for appeal for an independent review of cost and requirements to 3<sup>rd</sup> party.

## ◆ Operational Coordination:

- ◆ Coordination of Hybrid microgrid function with other grid services.
- ◆ In island mode, what is the role of a Hybrid Microgrid operator?
- ◆ In island mode who controls the distribution infrastructure within the microgrid including addressing issues related to post event damage assessment & any repair
- ◆ Fixed vs. Dynamic: What equipment settings are pre-programmed, and what are managed.

## ◆ Tariff Structure:

- ◆ Is a standard tariff an effective structure or are Hybrids unique and best addressed through PPAs/Operating Agreements?

\* Largely drawn from prior WG presentation from Andrew Barbeau





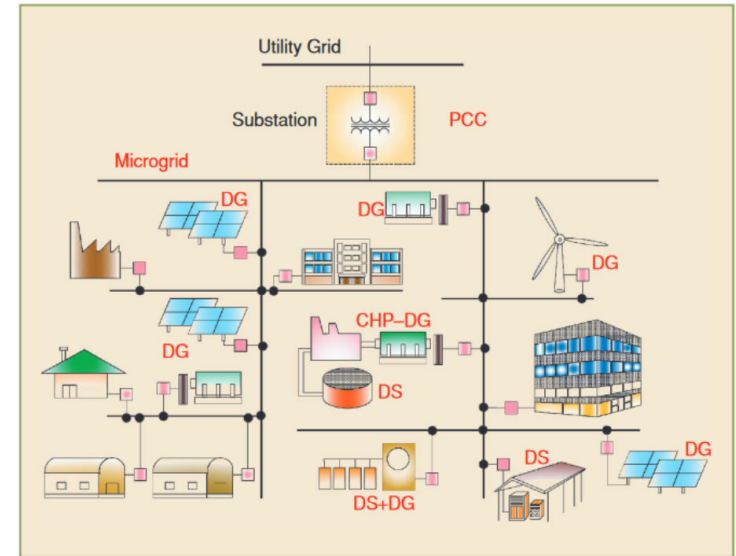
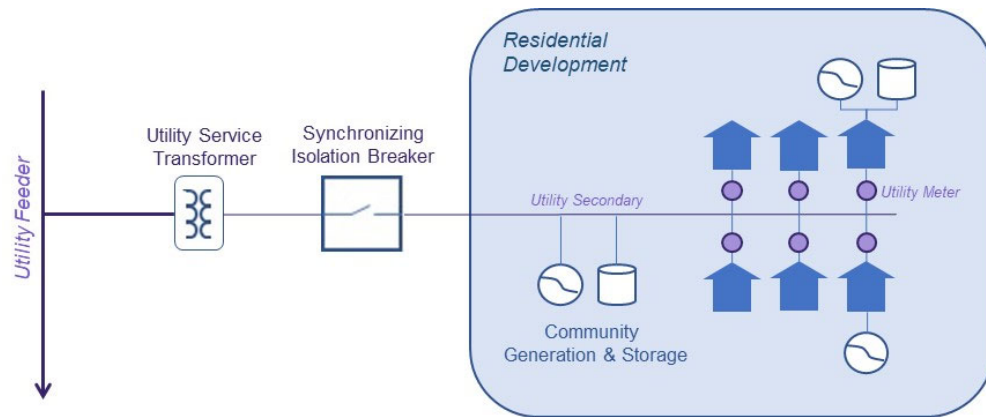
# Hybrid Microgrids

## Interconnection & Operational Discussion



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# Hybrid Microgrids

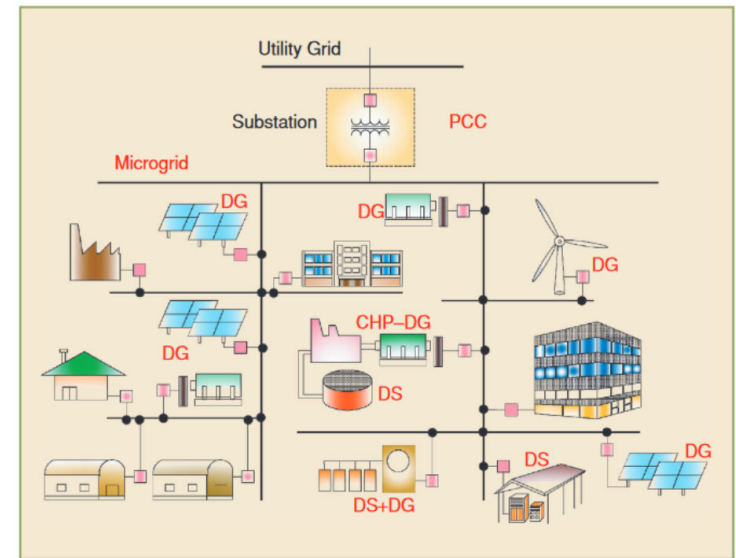
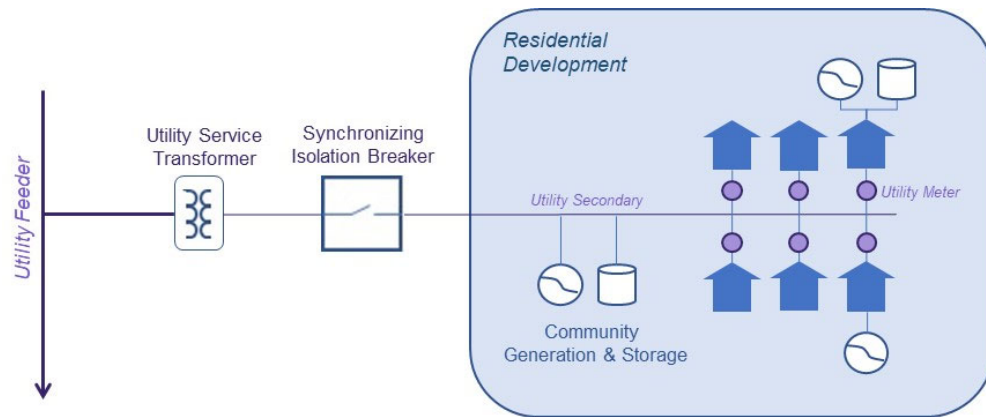


## ◆ Interconnection Facilities:

- ◆ What are the standard facilities the utility may need to install to enable the project?
- ◆ Determination of Cost: The net cost to the Hybrid Operator/Developer for the grid services/equipment required.
- ◆ Independent Review: Allow for appeal for an independent review of cost and requirements to 3<sup>rd</sup> party.
- ◆ Interconnection Requirements Study (IRS) may be required
- ◆ Modify Standard Interconnection Agreement (SIA)?



# Hybrid Microgrids



## ◆ Operational Coordination:

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- ◆ In island mode who controls the distribution infrastructure within the microgrid including addressing issues related to post event damage assessment & any repair
- ◆ Fixed vs. Dynamic: What equipment settings are pre-programmed, and what are managed.
- ◆ Operational Agreement Required?



# Hybrid Microgrids

## Simplified Tariff Concept



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# Hybrid Microgrid Tariff Concept

(adaptation of WG suggestion in Nov 21<sup>st</sup> Mtg)

**An approach to Hybrid MG Services Tariff structure is to simplify the utility-customer-MG operator relationship complexity by :**

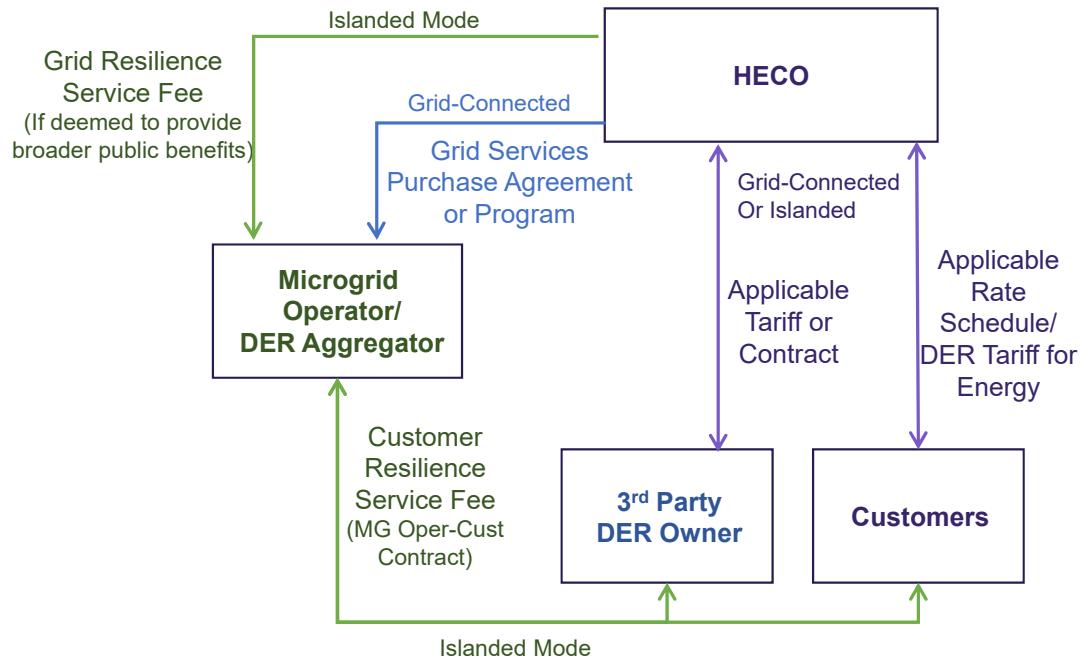
- ◆ Maintaining the same basic utility-customer/DER provider service tariff/program relationships during both normal and islanded modes.
- ◆ Recognize the MG Operator as providing a resilience operational service that temporarily dispatches MG resources to meet loads within MG boundary when islanded during a grid emergency or outage.

**Simplifying approach eliminates the complexity of:**

- ◆ Changing utility-customer/DER provider tariff relationships for energy purchases, sales and grid services and associated billing and settlement during relatively rare and short periods of time.
- ◆ Retail wheeling during island mode and ambiguity regarding operational & safety responsibility for utility distribution infrastructure
- ◆ Complex commercial/operational arrangement for MG Operator by using a simpler grid resilience service approach through the established Grid Services/NWA procurement/program approaches



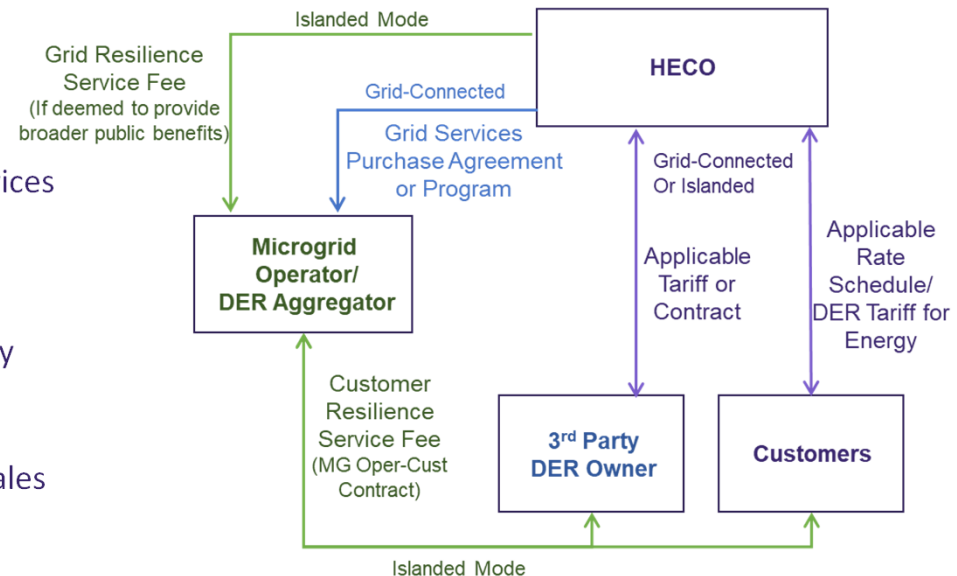
# Proposed Hybrid Microgrid Tariff Concept



# Proposed Hybrid Microgrid Tariff Concept

(adaptation of WG suggestion in Nov 21<sup>st</sup> Mtg)

- ◆ An approach to Hybrid MG Services Tariff structure is to simplify the utility-customer-MG operator relationship complexity by maintaining the same basic service relationships during both normal and islanded modes.
- ◆ MG Operator provides resilience services to customers within MG boundary and potentially to HECO for broader public benefits. (i.e., Operations as a Service)
  - ◆ MG Operator may also act as a DER Aggregator providing grid services to HECO during normal mode outside of MG Tariff
  - ◆ MG Operator may also be a DER owner within MG boundary
- ◆ HECO and customer/3rd Party DER owner relationships regarding energy sales (delivered and received) and distribution service remain the same independent of normal or island mode.
  - ◆ No change to utility metered services and export energy credits/sales
  - ◆ Grid (and NWA) services to HECO may be interrupted during emergency/outage depending on specific service/s provided, grid impacted and hybrid MG configuration.



# Proposed Hybrid Microgrid Tariff Structure & Roles

(adaptation of WG suggestion in Nov 21<sup>st</sup> Mtg)

## Hybrid Microgrid Operator

- ◆ Provides microgrid operations, control of associated MG resources, and single point of operational interface with HECO
- ◆ Provides resilience service to associated MG customers during emergency/outage
- ◆ May provide grid resilience service (where deemed to provide broader public benefits) to HECO during emergency/outage
- ◆ MG Operator may also act as a DER Aggregator during normal mode (i.e., Grid Services Purchase Agreements)

## Customer/3rd Party DER Owner

- ◆ HECO customer billed under applicable rate schedule/DER tariff/program during normal and emergency/outage conditions
- ◆ Customer/DER provider export energy delivered to HECO under applicable DER tariff/program during normal or emergency/outage
  - ◆ No change in transactional relationship
- ◆ Customer/DER Owner has contract with MG Operator for resilience services (includes resilience service fee) and operation and control of resources.

## HECO

- ◆ Customer/DER Owner service relationship during normal mode under applicable rate schedule/DER tariff/program
- ◆ HECO maintains operational responsibility for distribution infrastructure during emergency/outage in coordination with MG Operator
- ◆ HECO continues to buy export energy from customer/DER owner resources during islanded MG mode during an emergency/outage.
- ◆ HECO pays MG Operator a grid resilience fee only if broad public resilience benefits are provided. Grid resilience service and value would be identified in IGP resilience planning and conducted through a programmatic approach.





# Hybrid Microgrids

## Tariff Discussion



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# Hybrid Microgrids

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## 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
  - ◆ Utility-Private Partnership Microgrids
- ◆ Puerto Rico microgrid ruling and related activity and relevance to Hawaii



# Proposed Timeline for MGS Tariff WGs

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

