

Microgrid Services Tariff Working Group Symposium

October 14, 2019



Hawaiian Electric
Maui Electric
Hawaii Electric Light

Welcome and Opening Remarks



Hawaiian Electric
Maui Electric
Hawai'i Electric Light

Housekeeping

- ◆ Restrooms – Code: 3698
- ◆ Emergency Exits



Symposium Agenda

Purpose today is to develop a more detailed action plan for the MST WGs, including identifying detailed issues, sequence and priorities to achieve the “deliverables.”

8:30-9:15 Introduction

- ◆ Scope & Deliverables
- ◆ Framework for WGs’ Activity

9:15-10:30 Microgrid Archetypes

- ◆ Identify Archetypes in Relation to WG Scope
- ◆ Identify Specific MST Related Topics for WGs to Address for Each Archetype

10:30-10:45 Break

10:45-12:00 MGS Tariff Structure

- ◆ Identify Structural Considerations Based on Archetypes
- ◆ Identify Specific MST Topics for WGs to Address

12:00-12:15 Working Lunch

12:15-1:30 WG Work Planning

- ◆ Identify Additional Topics to Address
- ◆ Identify WGs’ Action Items
- ◆ Determine Meeting Schedule

Note: Invited guest presenters will share relevant insights from other states during the morning segments



Introduction



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MST WG Focus & Scope

There are many potential topics, but the Act and Commission have narrowed the WGs' focus

Focal Point of Docket 2018-0163

“To better focus the commission's and Parties' near-term efforts on activities that can support the intent of Act 200, the commission's **initial priority** in developing the microgrid services tariff *is to facilitate applications of microgrids that improve energy resiliency, particularly the islanding of microgrids during emergency events and grid outages to provide backup power to customers and critical energy uses.*”

(See Order 36481 at 48.)

Commission Determinations for Priority Items

- 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

MST WG Focus & Scope

Expectations of Working Groups

Working Groups	Tasks	Deliverables
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
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 Proposed compensation for use of HECO Companies' distribution system, if necessary Recommendations to modify existing programs, and/or new programs or services, if necessary, to support microgrid development Justification for compensation for clearly demonstrated benefits to non-participants, if necessary

MST WG Deliverables

Status Reports and Status Conferences

- Co-chairs provide status reports or presentations detailing the Working Group's progress thus far, and summarizing unresolved issues and challenges
- Written status reports or presentation slides will be made a part of the docket record
- Status Conferences will be facilitated by Commission Staff



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Final Working Group Report

- Final Working Group Reports must be filed by February 14th, 2020
- Reports should identify areas of consensus and disagreement
 - For areas of consensus, necessary language for tariff modifications (with red-lines) or a new tariff should be provided
 - For areas of disagreement, participants should provide their individual perspectives
- Tariff modifications or new tariffs should be attached to the Reports as Exhibits
- Reports will be utilized by the HECO Companies in creating a Draft MGS Tariff and in updating language to other tariffs



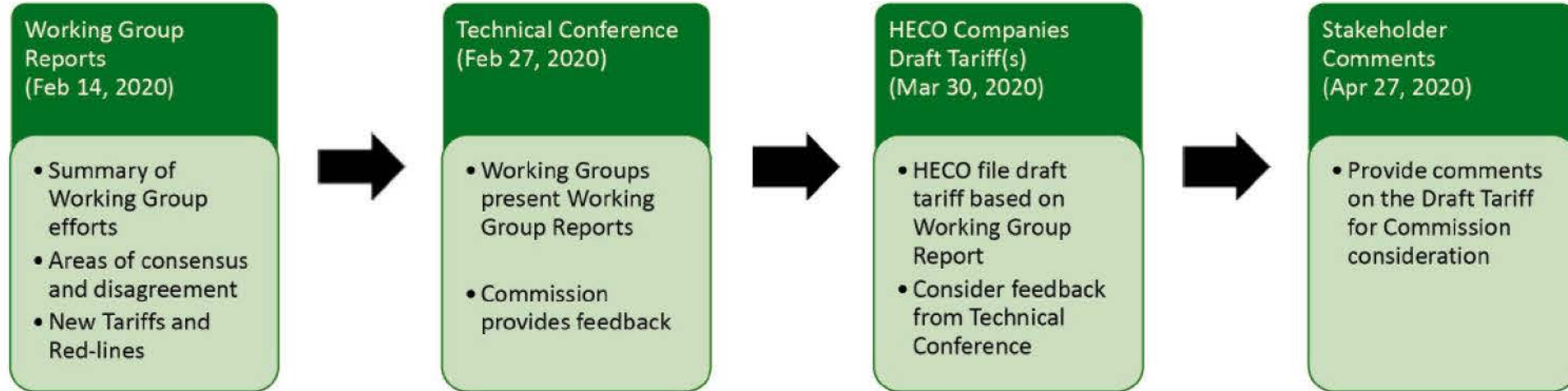
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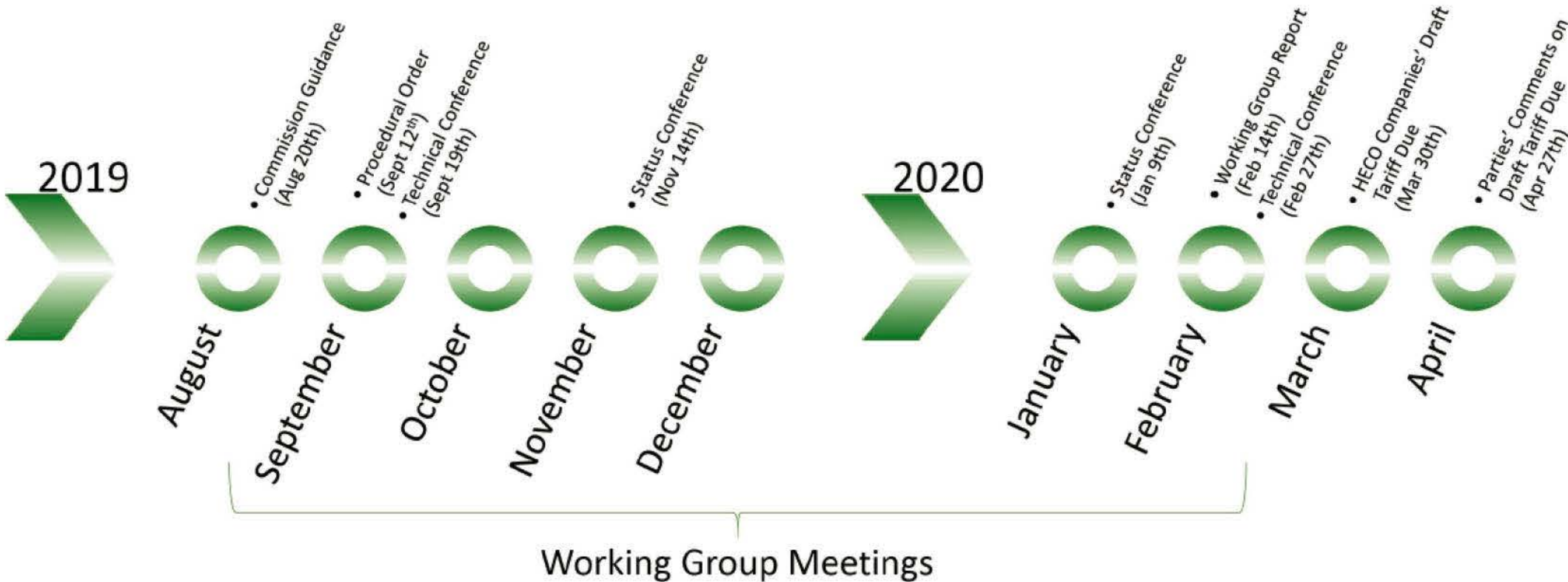
Steps After Working Group Reports



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Schedule



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Microgrid Services Tariff Framework - Insights from DC

Jared Leader

Manager, Industry Strategy
Smart Electric Power Alliance (SEPA)



Microgrid Services Tariff Framework



Services and Functions

What are the different value streams that microgrids can operate in?

What microgrid services or functions should be considered in developing a microgrid services tariff?

Microgrid Classifications

What characteristics and classifications of a microgrid should be included in the microgrid services tariff?

Microgrid Assets

What newly created and existing assets make up the microgrid and should be considered for the tariff?

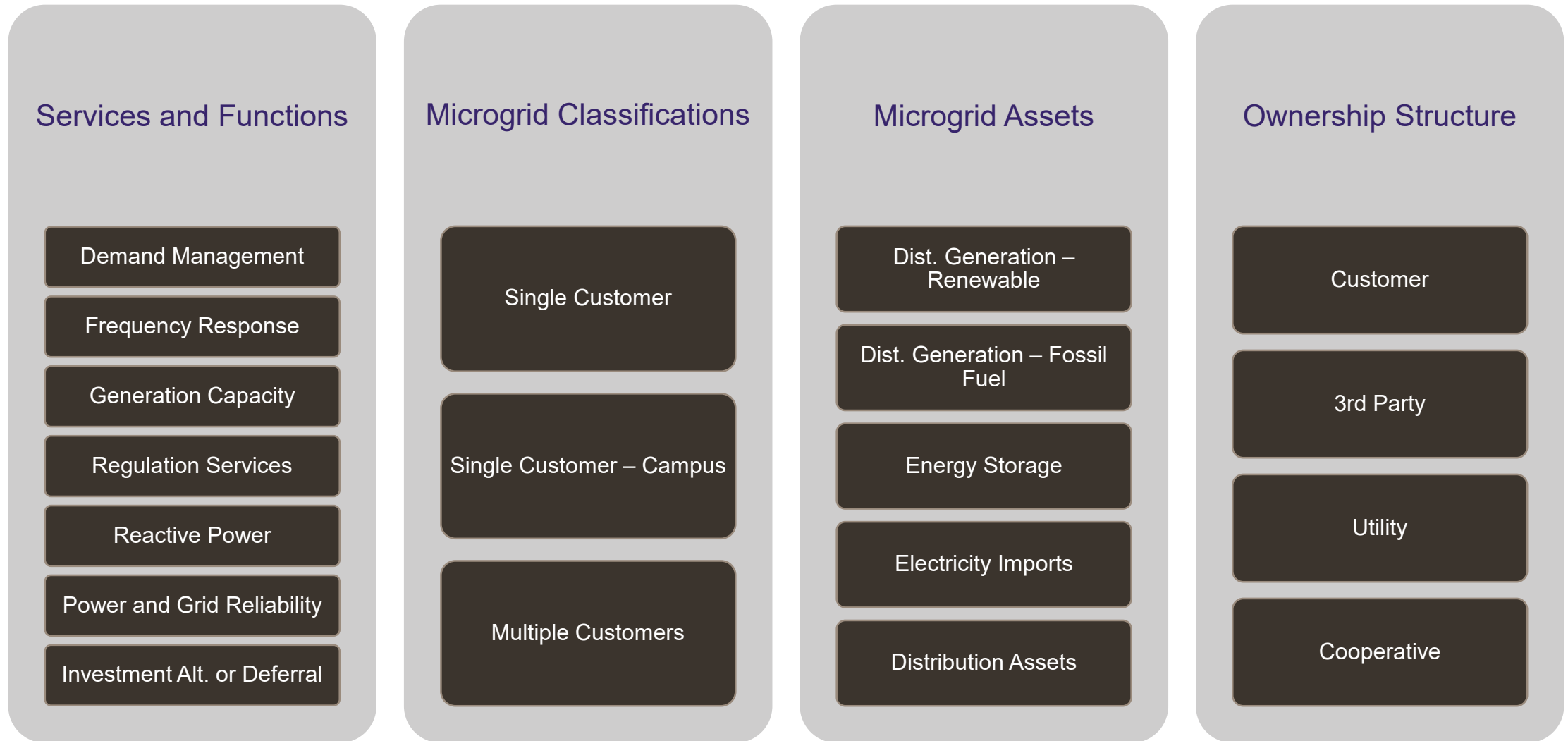
Are there preferred generation resource types or sizes?

Ownership Structure

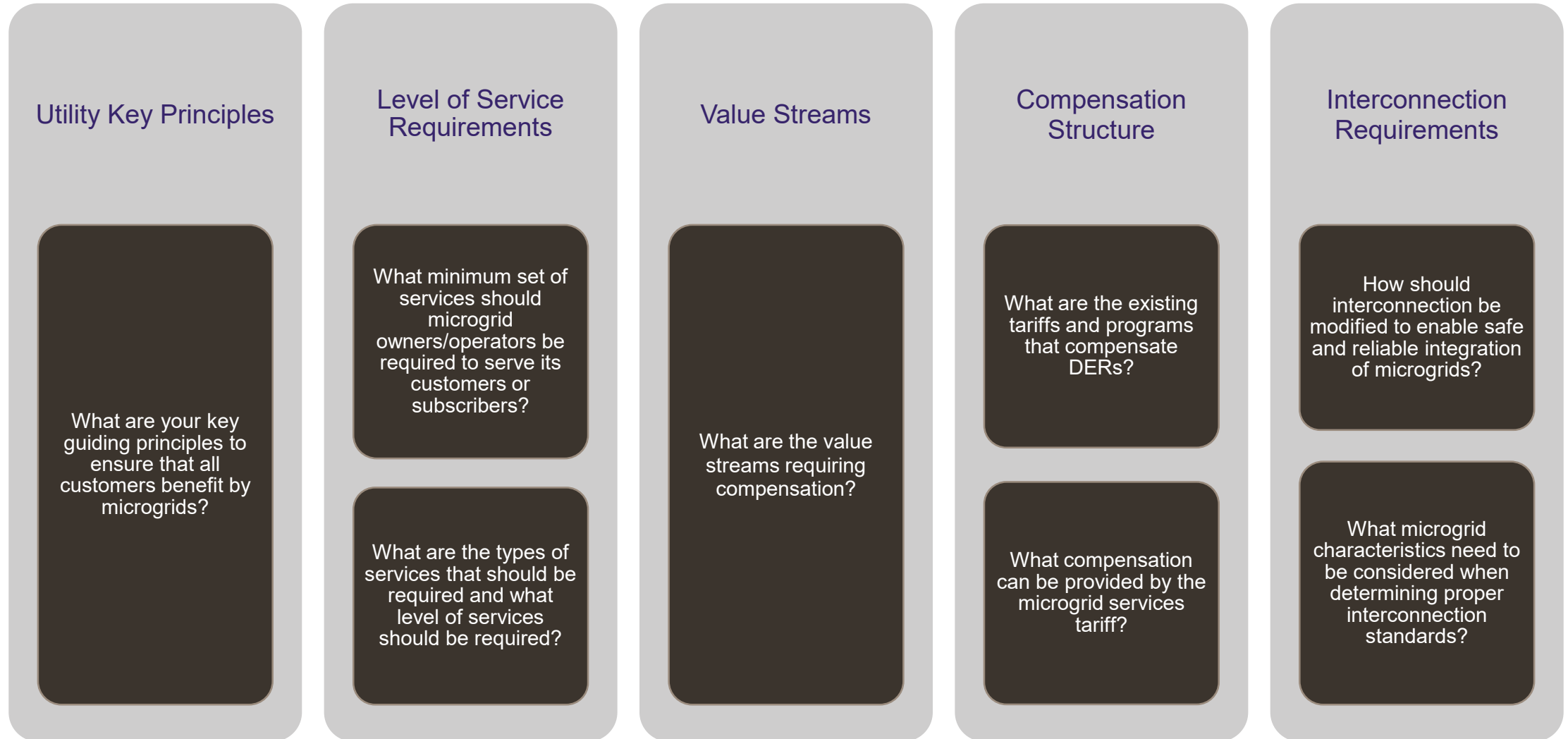
What ownership structures are there for microgrids?

What different entities can own different assets of the microgrid?

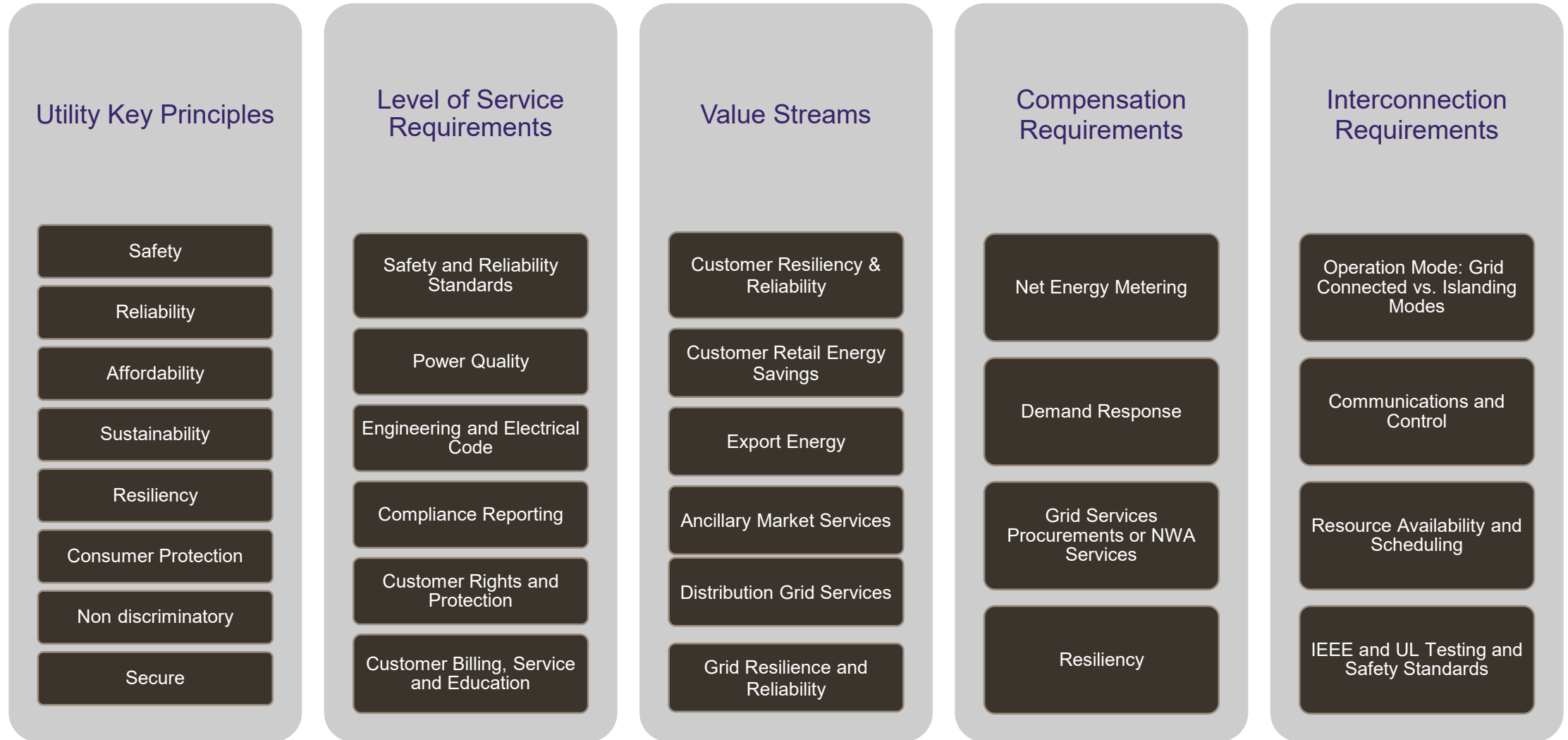
SEPA Microgrid Services Tariff Framework



SEPA Microgrid Services Tariff Framework



SEPA Microgrid Services Tariff Framework



Microgrid Services Tariff Topics

Today's Discussion

Microgrid Architectures

What types of microgrid architectures and characteristics should be included in a standard microgrid services tariff?

Microgrid Tariff Structure

What types of microgrid tariff structure/s may be needed?

Interconnection & Coordination Requirements

How should interconnection be modified to enable safe and reliable integration of microgrids?

What operational coordination considerations are needed for various types of microgrids?

Services and Functions

Do existing tariffs programs and procurements enable microgrid provided energy and grid services?

What utility services or functions should be considered in developing a microgrid services tariff?

Compensation Structure

What are the existing tariffs, programs and procurements that compensate DERs?

What compensation can be provided by the microgrid services tariff?

Source: Adapted from SEPA



Discussion Questions

- ◆ What considerations related to the MGS scope should be considered for these WGs and required deliverables?
- ◆ MGS scope is potentially very large and may take longer than time allowed to address all aspects in detail – how should the WGs address topic areas that may require more time and supporting analysis than allowed?
- ◆ MGS scope will likely raise issues that are within the scope of other dockets, how should these be addressed?
- ◆ Is this framework approach agreeable to use for organizing the WG discussion topics?
- ◆ What framework refinements should be incorporated?



Microgrid Archetypes



What Microgrid Archetypes are Within the MGS Tariff Scope?

A "microgrid project" is defined by HRS 269-46 to mean;

“a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as single controllable entity with respect to the utility's electrical grid and can connect to public utility's electrical grid to operate in grid-connected mode and can disconnect from the grid to operate in island mode, and that:

- (1) Is subject to microgrid services tariff; and
- (2) Generates or produces energy.”

Source: HPUC D&O 36481 p.3



Microgrid Archetypes - Insights from Illinois

Andrew Barbeau

President

The Accelerate Group



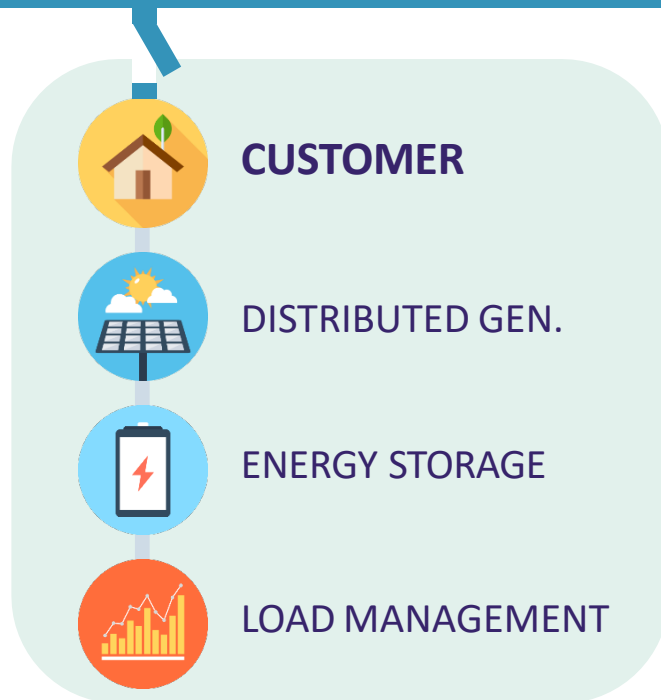
Off-Grid Microgrid

Utility Microgrid

Virtual Microgrid

3rd-Party Microgrid

Distribution Feeder



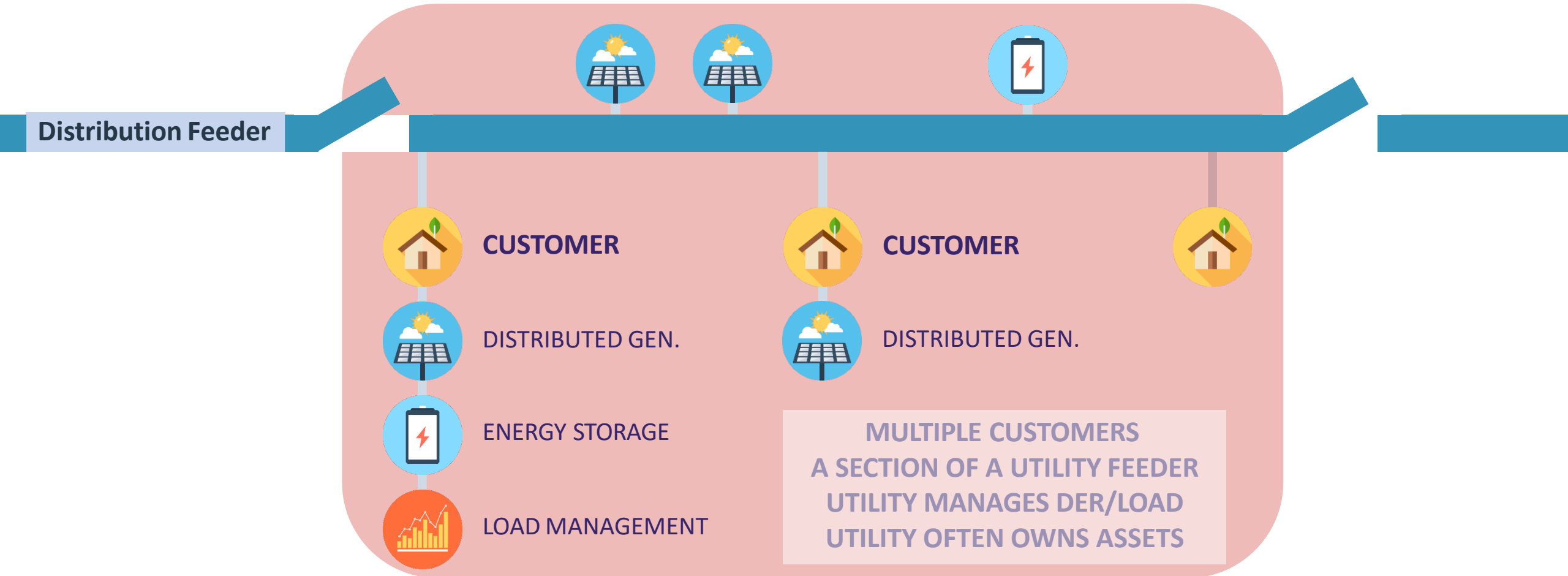
**SINGLE CUSTOMER
CAN ISLAND ITSELF
3RD PARTY MANAGES DER/LOAD BEHIND METER**

Off-Grid Microgrid

Utility Microgrid

Virtual Microgrid

3rd-Party Microgrid



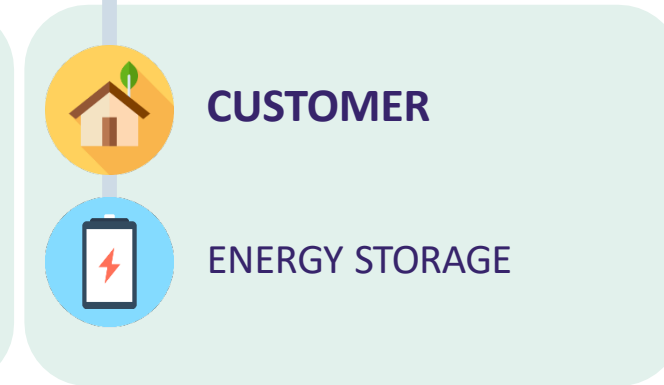
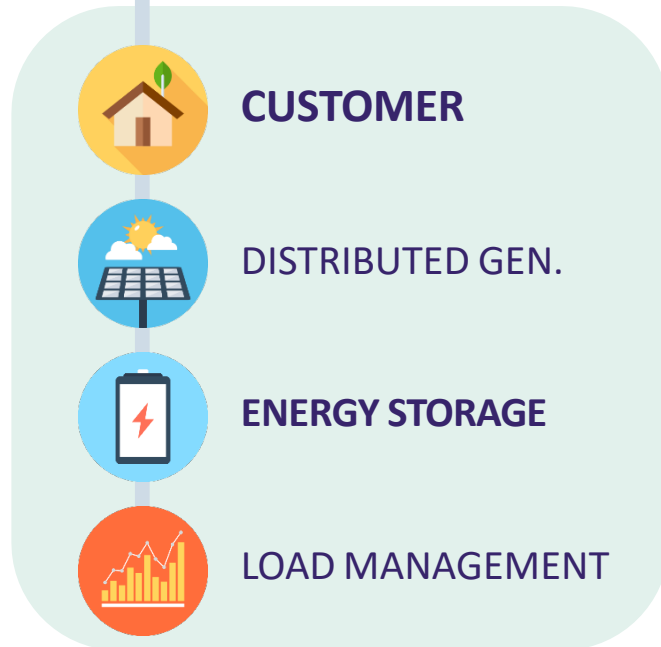
Off-Grid Microgrid

Utility Microgrid

Virtual Microgrid

3rd-Party Microgrid

Distribution Feeders



**MULTIPLE CUSTOMERS
PRIMARILY A FINANCIAL ARRANGEMENT
CANNOT ISLAND**

Off-Grid Microgrid

Utility Microgrid

Virtual Microgrid

3rd-Party Microgrid

Distribution Feeder



CUSTOMER



DISTRIBUTED GEN.



ENERGY STORAGE



LOAD MANAGEMENT



CUSTOMER



DISTRIBUTED GEN.



CUSTOMER



ENERGY STORAGE

**MULTIPLE CUSTOMERS
CAN ISLAND A SECTION OF A UTILITY FEEDER
3RD PARTY MANAGES DER/LOAD
COORDINATES WITH UTILITY**

Off-Grid Microgrid

Behind the Meter

Single Point of Connection

Limited Regulatory Approach Needed

Interconnection Requirements

Utility Microgrid

Utility-Owned and Managed DER

Individual Approvals

Proposed to Serve Critical Infrastructure

Research and Learnings

Virtual Microgrid

Typically Not Connected or on Same Feeder

Provide Coordinated Grid Services

Organized by Aggregator

3rd-Party Microgrid

Multiple Customers on Same Segment of a Feeder

DER/Load Managed by Third-Party

Utility Manages Grid Equipment

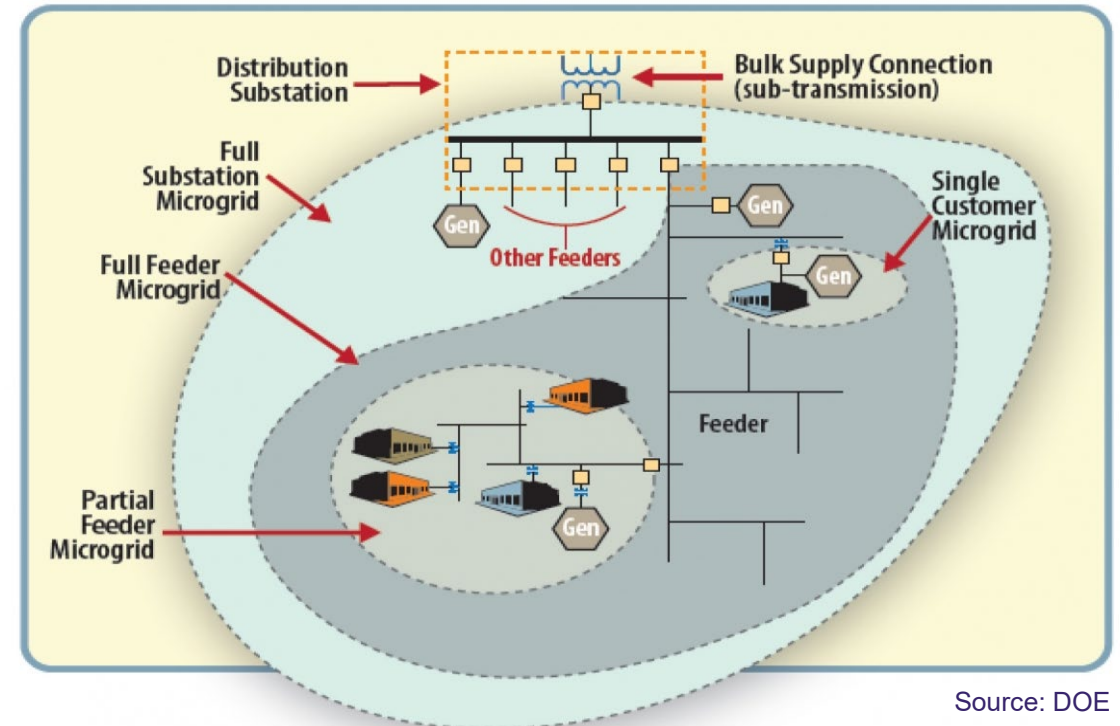
MORE COMPLEX ARRANGEMENT BETWEEN CUSTOMER/UTILITY

Microgrid Archetypes

Which general types of microgrids are in scope for MGS Tariff scope consistent with Act 200?

Examples for discussion

- ◆ Single Customer/Campus microgrids
 - ◆ Behind the utility meter interconnection microgrid
 - ◆ Serving single customer premises, or
 - ◆ Campus type
- ◆ Multi-user microgrids
 - ◆ Multiple customers and resources interconnected by utility grid within clearly defined electrical boundaries that can disconnect from the larger grid to operate in island mode
 - ◆ For example,
 - ◆ Community minigrid
 - ◆ HOA with single utility tap line/low voltage distribution network



Source: DOE



MGS WG Organizing Framework

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

MG Type		Tariff Structure	Interconnection Rule 14H	Interconnection Process Chg	Energy & Grid Services	Resilience Services	Retail Wheeling	Other
BTM Microgrid	Single Customer							
	Multiple Customer - Campus							
Multi-user Microgrid	Multiple Customer - HOA							
	Community - Minigrid							



Discussion Questions

- ◆ Are these basic archetypes helpful for framing the specific detailed issues to address?
- ◆ Are there other types of MGs to consider that do not fit these archetypes?
- ◆ How should the basic types of MGs inform the detailed topics that need to be addressed in a MGS tariff and Rule 14H?
- ◆ What is the expectation on the development of MGs in Hawaii regarding these archetypes?
 - ◆ Is there a need to consider prioritizing the limited WG time available for this effort to focus on the most prevalent types of microgrids?
 - ◆ Is there the possibility to limit discussion on some MG types to issues that can be addressed in the short term and identify the issues that will need more time to fully address or may be more appropriate to another docket?



Microgrid Tariff Structure/s



Microgrid Tariff Structure/s - Insights from DC

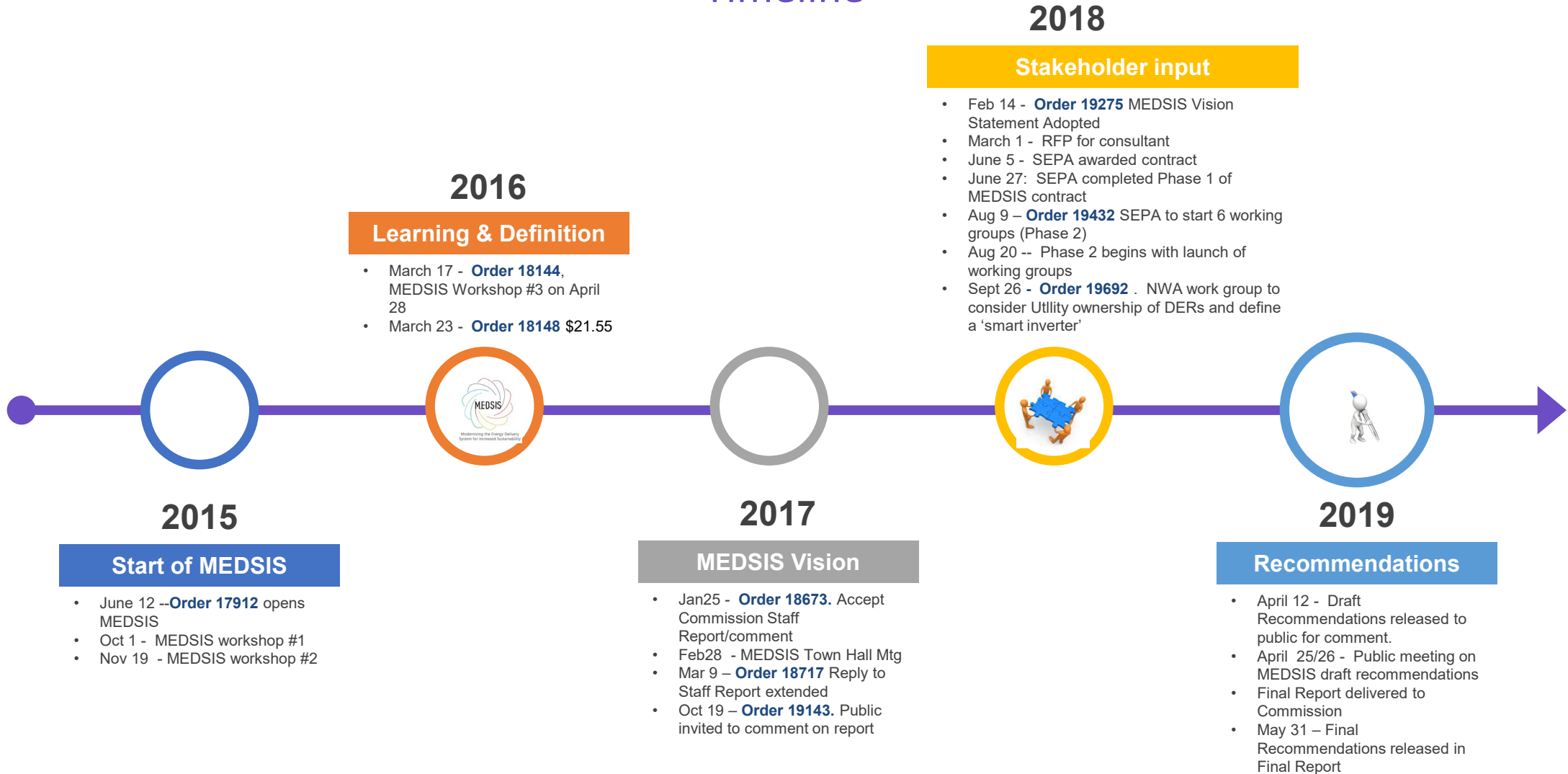
Jared Leader

Manager, Industry Strategy
Smart Electric Power Alliance (SEPA)



MEDSIS (Formal Case 1130)

Timeline



PowerPathDC (formerly MEDSIS) Update



- ♦ **May 31, 2019:** MEDSIS Working Groups submitted report to DCPSC with 32 actionable recommendations and 10 learnings across the 6 working groups
- ♦ **August 2, 2019:** DCPSC releases Staff Order adapting/adopting recommendations made in the working group report.
- ♦ **September 16, 2019:** First Round of Comments on Order
- ♦ **October 1, 2019:** Reply Comments on Order
- ♦ **TBD:** DCPSC Release Final Order on Recommendations

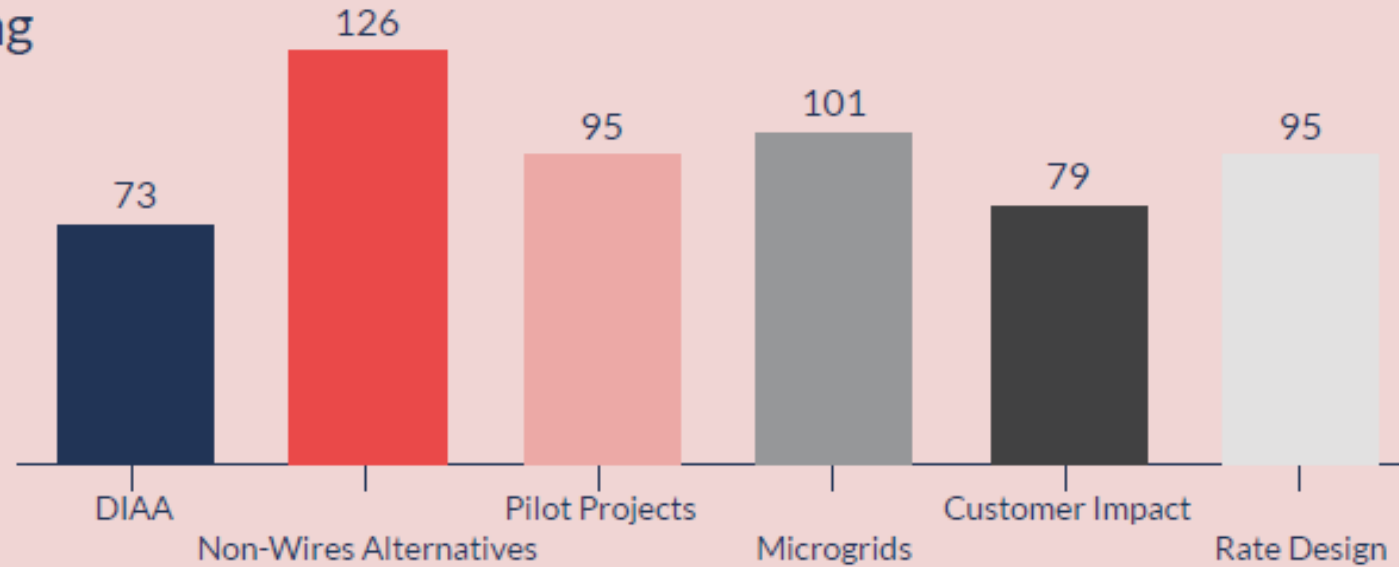
[For more information on Power Path DC](#)

By the Numbers

6 Unique Working Groups

1 Vision

"The District of Columbia's modern energy delivery system must be sustainable, well-planned, encourage distributed energy resources, and preserve the financial health of the energy distribution utilities in a manner that results in an energy delivery system that is safe and reliable, secure, affordable, interactive, and non-discriminatory."



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Stakeholder
Strawman Proposals



32

Actionable
Recommendations



50

Working Group
Meetings Held



250+

Participants in Total



300+

Action Items
Completed



460+

Individual Stakeholder
Documents Shared

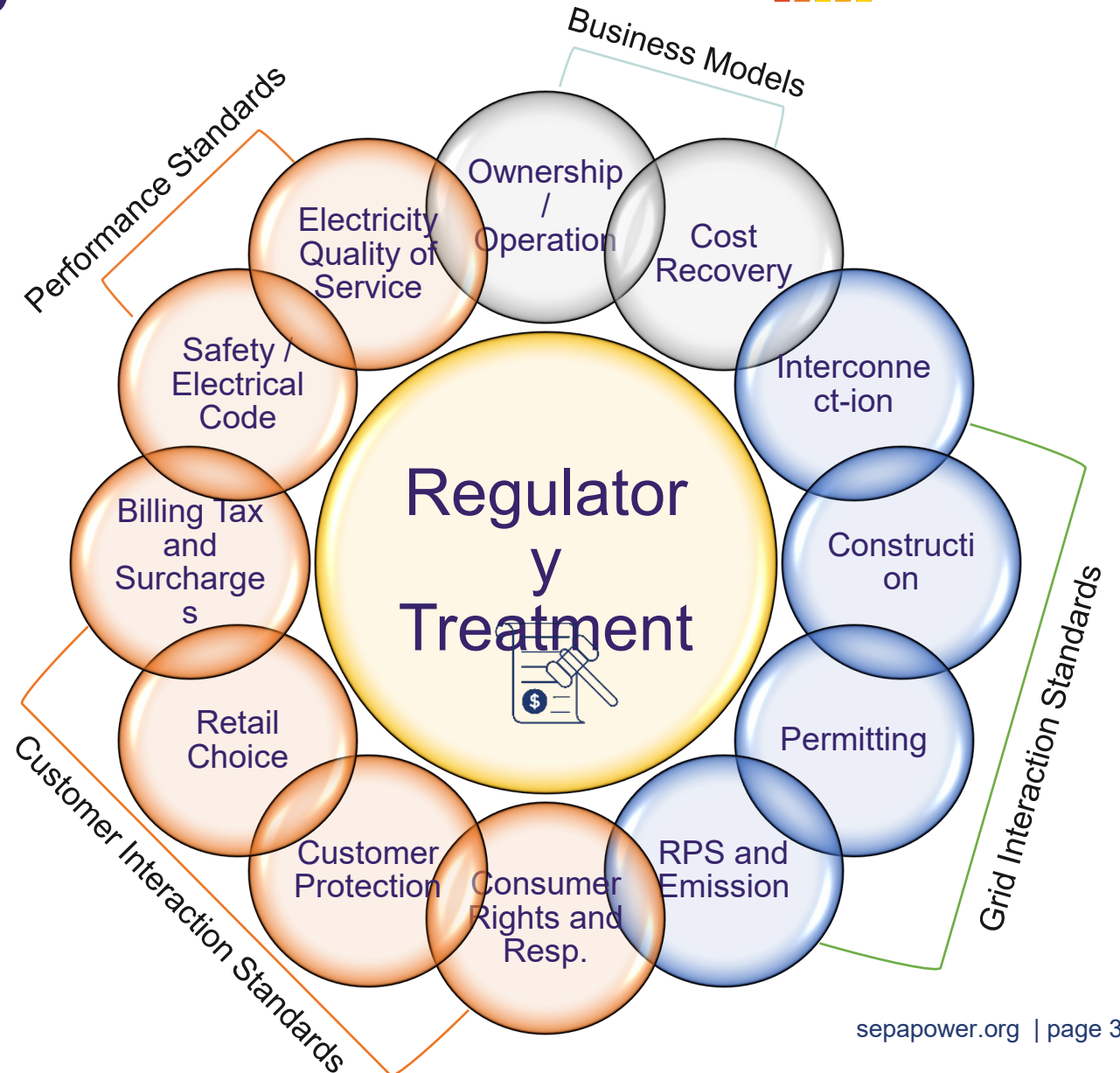
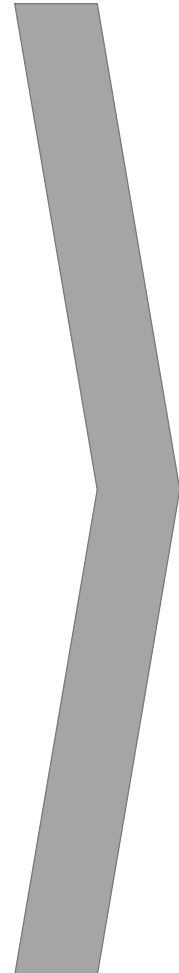
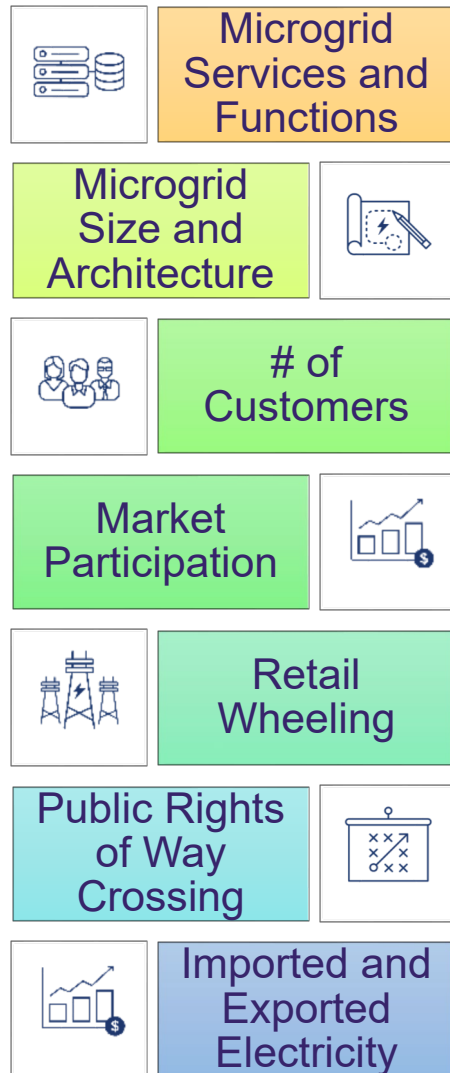


Microgrid Recommendations to DCPSC



1. ID Microgrid Assets and Classifications in the District
- 2. Establish a Regulatory Framework in the District and Leveraging Existing DCPSC & DC Government Standards**
- 3. Establish New Regulated Entity of "Microgrid Operator"**
- 4. Direct the Utility to Establish a Customer Microgrid Schedule (*similar to HECO MST*)**
- 5. Establish Rules on Utility Cost Recovery of Microgrid Assets**
6. Define Resilience at the Distribution Level
7. Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage
8. Define a Customer Complaint Process for Assets that are Leased or Operated by Third-Party

Establish a Regulatory Framework in the District



Customer Service



Multi-Customer Microgrids: DCPSC should apply Consumer Rights and Responsibilities and Customer Protection standards parallel to the standards applicable to Electricity Suppliers and Electric Companies as outlined in Title 15 of DCMR.

Single Customer Microgrids: No regulatory oversight, through contractual agreements.

Electrical Service



Multi-Customer Microgrids:

- Microgrid Development, Public Interest Groups, Clean Energy Advocates: Electricity quality of service should be handled directly through contractual requirements between microgrid operator and its customers.
- Utility Industry and Ratepayer Advocates: Electricity quality of service should be held to the same standards as electric companies.

Single Customer Microgrids: No regulatory oversight, through contractual agreements.

Retail Choice



Multi-Customer Microgrids: Private contract with microgrid-specific disclosure provisions is sufficient for retail choice and should be subject to compliance review regarding such provisions by DCPSC. If the DCPSC decides that private contract is sufficient, DCPSC should ensure appropriate use of microgrid-specific private contract disclosure provisions can allow for safe harboring of such private contracts from advanced DCPSC review. Safe harbor provisions regulated by the DCPSC could include but are not limiting to full disclosure of long term retail choice, restrictions on the ability for individual customers to exercise customer choice for imported electricity separately from the microgrid operator's decision, appropriate customer disclosure of the microgrid itself and the associated long-term commitment.

Single Customer Microgrids: No regulatory oversight

Define Resilience at the Distribution Level

Utility Perspective

- Customer-hour outage
- Customer energy not served
- Customers experiencing outage
- Cost of damages

Community Perspective

- Critical infrastructure served
- Provision of power to public good services
- Not one agreed upon method for assigning dollar amount
- Different tiers of critical

Business Perspective

- Cost of an outage
- Value to surviving certain time of an outage
- Value of loss load
- Easy to quantify for a single business, not to justify socializing costs to all

Microgrid Tariff Structure/s - Insights from Illinois

Andrew Barbeau
President
The Accelerate Group



Microgrid Services Tariff Components

Core Components of a Tariff should describe the roles, responsibilities, and processes for the implementation of the microgrid.



Applicable Customers: Which customer classes are eligible.



Request Process: Establishment of a process for a customer to opt-in to a multiple-customer microgrid.



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



Determination of Cost: The net cost to the customers for the grid services/equipment required.



Independent Review: Allow for appeal for an independent review of cost and requirements to 3rd party.



Determination of Payment: The method of payment by the customer.



Coordination: Coordination of microgrid function with other grid services.

Microgrid Services Tariff Open Questions

More discussion is needed to identify challenges of opt-in Microgrid Services



Free-Riders: How do you deal with customers within a microgrid footprint but not willing to pay?



Who Operates: In island mode, what is the role of a 3rd party operator?



Net Costs: How do you calculate the net cost premium of equipment over standard expense.



Net Benefit: What net benefits can 3rd Party Microgrids provide to support the grid as a whole?



Equipment: What are the standard facilities the utility can install to enable the project?



Differentiated Quality of Service: Ensure utility obligations for equal provision of service.



Fixed vs. Dynamic: What equipment settings are pre-programmed, and what are managed.

Discussion Questions

- ◆ What type of microgrid tariff structure/s should be considered?
 - ◆ Tariff for each general type of microgrid?
 - ◆ BTM MG
 - ◆ Multi-purpose MG
 - ◆ Tariff Structure (Stakeholder comments below)
 - ◆ “Path 1 would be that the microgrid services tariff stands alongside the existing export or non-export tariffs as a separate tariff.”
 - ◆ “Path 2 would be that the microgrid services tariff layers on top of the existing tariffs, in the same way that Rule 14H is the foundation for the existing tariffs.”
 - ◆ “Portal” Tariff
 - ◆ Others?
- ◆ What other aspects should be considered regarding structure?



MGS Tariff WGs Work Planning

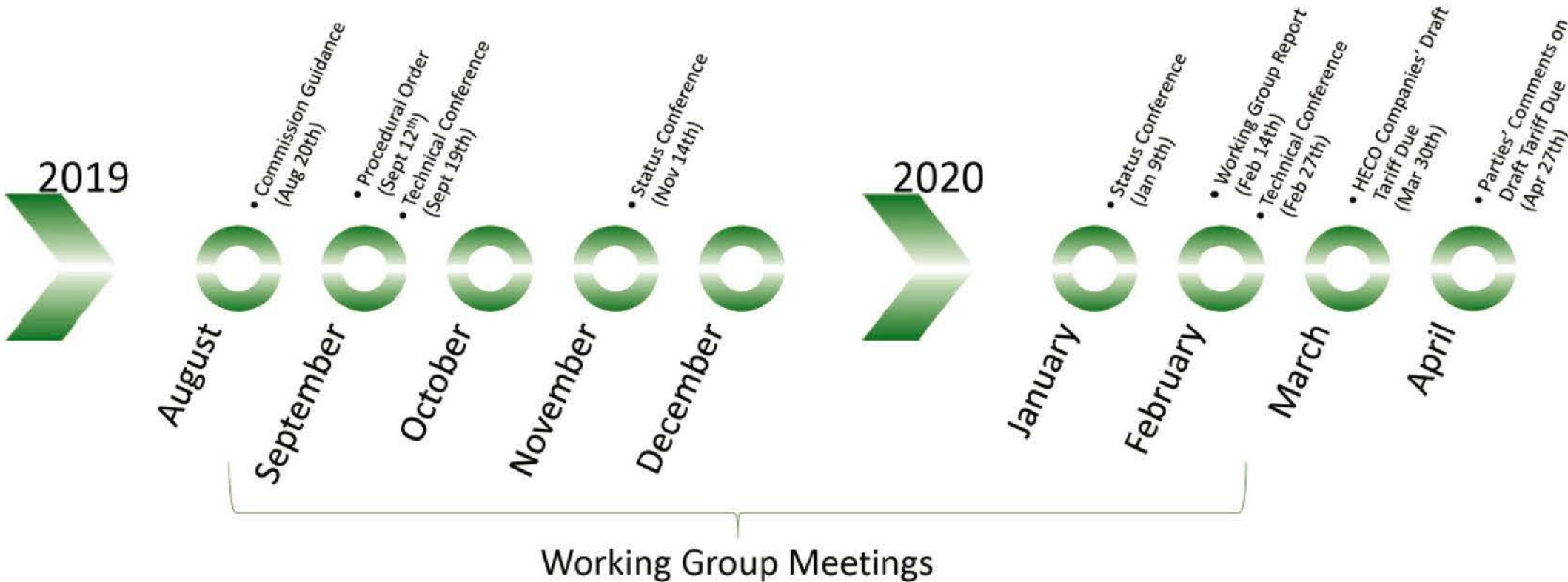


MST WG Focus & Scope

Expectations of Working Groups

Working Groups	Tasks	Deliverables
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
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 Proposed compensation for use of HECO Companies' distribution system, if necessary Recommendations to modify existing programs, and/or new programs or services, if necessary, to support microgrid development Justification for compensation for clearly demonstrated benefits to non-participants, if necessary

Schedule



State of Hawaii
Public Utilities Commission



MGS WG Organizing Framework

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

	MG Type	Tariff Structure	Interconnection Rule 14H	Interconnection Process Chg	Energy & Grid Services	Resilience Services	Retail Wheeling	Other
BTM Microgrid	Single Customer	?	Minor Changes (IEEE/UL microgrid safety standards)	?	Yes (Existing Pricing, Programs & Procurements)	?	N/A	?
	Multiple Customer - Campus	?	Minor Changes (IEEE/UL microgrid safety standards)	?	Yes (Existing Pricing, Programs & Procurements)	?	N/A	?
Multi-user Microgrid	Multiple Customer - HOA	?	?	Yes	Yes (Existing Pricing, Programs & Procurements)	?	Yes (case specific considerations & cost of service study)	?
	Community - Minigrid	?	?	Yes	Yes (Existing Pricing, Programs & Procurements)	Yes (Need service definition & value methodology)	Yes (case specific considerations & cost of service study)	?



Microgrid Services Tariff Topics

Nov – Feb Working Group Mtgs

Microgrid Architectures

What types of microgrid architectures and characteristics should be included in a standard microgrid services tariff?

Microgrid Tariff Structure

What types of microgrid tariff structure/s may be needed?

Interconnection & Coordination Requirements

How should interconnection be modified to enable safe and reliable integration of microgrids?

What operational coordination considerations are needed for various types of microgrids?

Services and Functions

Do existing tariffs programs and procurements enable microgrid provided energy and grid services?

What utility services or functions should be considered in developing a microgrid services tariff?

Compensation Structure

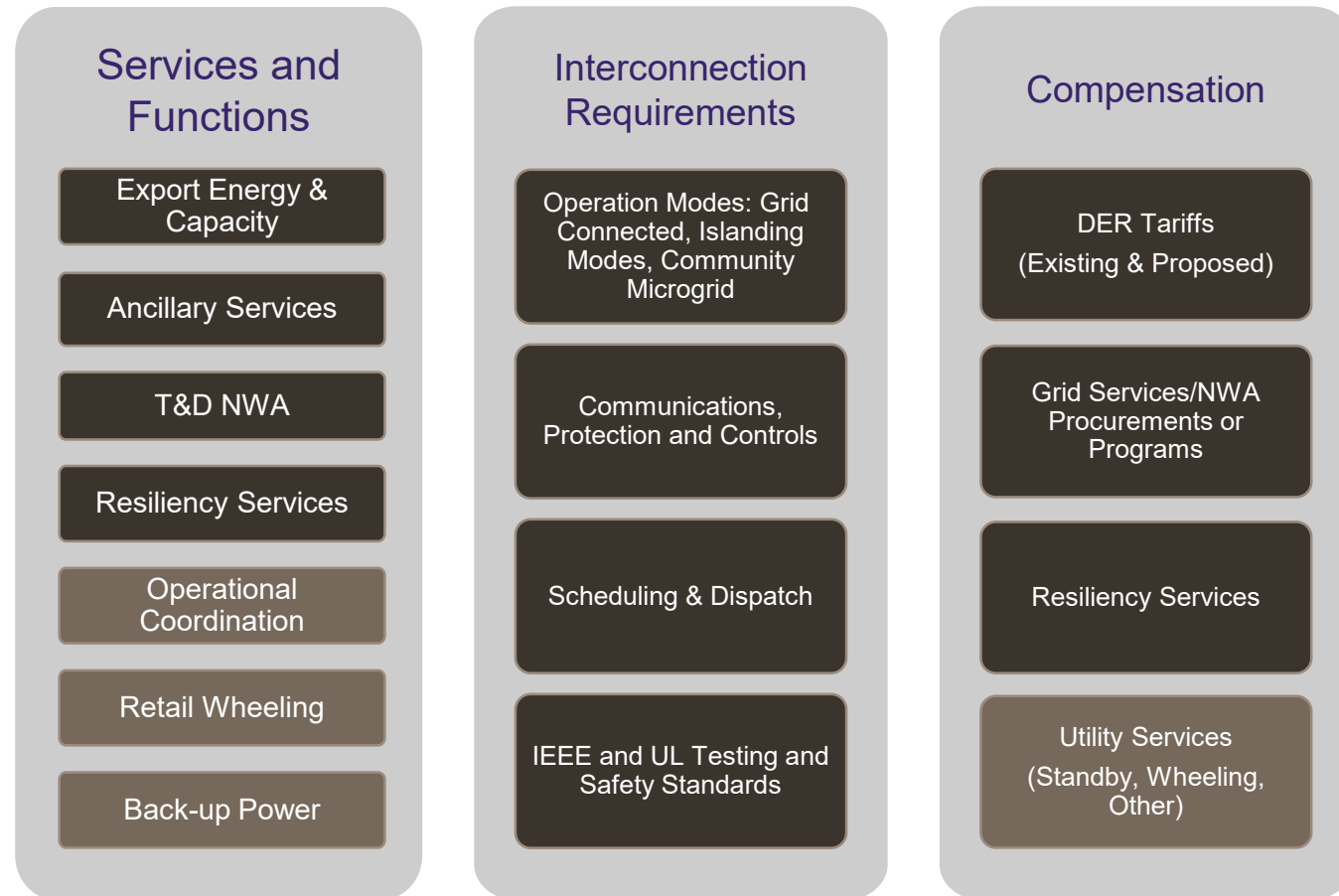
What are the existing tariffs, programs and procurements that compensate DERs?

What compensation can be provided by the microgrid services tariff?

Source: Adapted from SEPA



Microgrid Services Tariff Subtopics



Source: Adapted from SEPA



Discussion Questions

- ◆ What are the key topics & subtopics that need to be addressed in the WGs?
- ◆ What are the priority topics and sequence for the discussions?
- ◆ Any suggestions to organize the discussions and feedback on topics?
- ◆ What are effective approaches to developing the WG report given the short timeline?
 - ◆ Who will draft: stakeholder volunteers, co-chairs, others?
 - ◆ Review process: How to solicit and capture comments on WG report?
 - ◆ Form: powerpoint or word document
 - ◆ Other considerations?
- ◆ WG Status reports
 - ◆ Ok for Co-chairs to develop?
 - ◆ If needed, how could WG review of status be conducted in timely manner?
- ◆ MSG WG meetings
 - ◆ Are joint meetings structured to address the required topics acceptable?
 - ◆ Are webinars, as needed, acceptable to use in between in-person meetings?
- ◆ Other organizing considerations?



Proposed Topics & Sequence for Next WG Meetings

What set of topics should be covered in the next meetings?

◆ Nov 2019:

- ◆ Rule 14H Changes
 - ◆ BTM MG
 - ◆ Multi-user MG
- ◆ Tariff Structures
 - ◆ Existing tariffs/programs & procurements
 - ◆ New structures

◆ Dec 2019:

- ◆ Interconnection Process Changes
 - ◆ BTM MG
 - ◆ Multi-user MG
- ◆ MG & Utility Services
 - ◆ Resilience Services
 - ◆ Retail wheeling & other utility services

◆ Feb 2020:

- ◆ Review draft MGS tariff (annotated outline)
- ◆ Finalize WG Reports



Proposed Action Items by Next WG Meeting

What are the action items for next meeting?

◆ Action Items:

- ◆ Identify any specific stakeholder/expert presentations for WG meetings
- ◆ Revise MG organizing framework based on feedback
- ◆ Develop draft approach to MG tariff structure/s
- ◆ Prepare prep material (relevant documents) for next meeting
- ◆ Prepare briefing deck for Nov 14th WG Status Check
- ◆ Nov. 21 – Need a conference room
- ◆ ?



Proposed Timeline for MST WGs

Adjust as needed based on co-chairs' direction

