

Microgrid Services Tariff (MST) Phase 2: Working Group Meeting #3

Docket 2018-0163

June 16, 2022



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

Agenda

- 10:00-10:10 Review of Objectives & Ground Rules
- 10:10-10:30 Guest Speaker: Joe Paladino, DOE (“Value of Resiliency”)
- 10:30-10:55 Q&A/Discussion
- 10:55-11:00 BREAK
- 11:00-11:15 Guest Speakers: Ken Aramaki, HECO & Katy Waechter, NREL (ETIPP update)
- 11:15-11:30 Q&A/Discussion
- 11:30-11:50 Open Discussion: Development of Hybrid vs Customer MGs
- 11:50-12:00 Review topics/schedule for remaining weeks

Objectives

PUC Phase 2 Objectives:

1. Continue development of the Tariff
 - ❖ Promote self-sufficiency and resiliency among microgrid project operators
 - ❖ Streamline MST
2. Enhance Tariff to support broader use of microgrids in non-emergency situations
 - ❖ At minimum, enable voluntary islanding
3. Further explore opportunities to support resilience through microgrid development
 - ❖ Encourage development of microgrids that can provide power to remote communities and critical facilities such as schools, shelters, and hospitals
4. Identify grid services that can be provided by microgrids
 - ❖ Explore ways related exchanges between the utilities and microgrid operators could happen

Working Group Objectives (not in order of priority – will be discussed at future working group meetings):

1. Coordinate and align with other Dockets to leverage resources and streamline efforts
2. Focus on resiliency
 - ❖ Microgrids and/or other tools/programs
 - ❖ “Low-hanging” fruit, with such considerations as Act 200 goals, practical implementation, “real-world” goals, technical, costs, etc.
3. Understand how the tariff could support microgrid operations in non-emergency situations
 - ❖ Existing microgrid operations
4. Keep costs to all customers in mind (cost equity)
 - ❖ Compensation (e.g., rates, standby rates, exit fees, etc.)
5. Encourage development of grid services

Ground Rules

- ◆ Members will maintain an open mind and be respectful of all views
- ◆ Members will review meeting agenda in advance and complete any pre-reads prior to the meeting
- ◆ Discussion will be kept on agenda topic

Guest Speaker:
Joe Paladino
Office of Electricity
US Department of Energy

MST Ph 2 Priority Issue:

Resilience services and compensation, including societal and environmental value, to inform development of a resilience tariff “value of resiliency”



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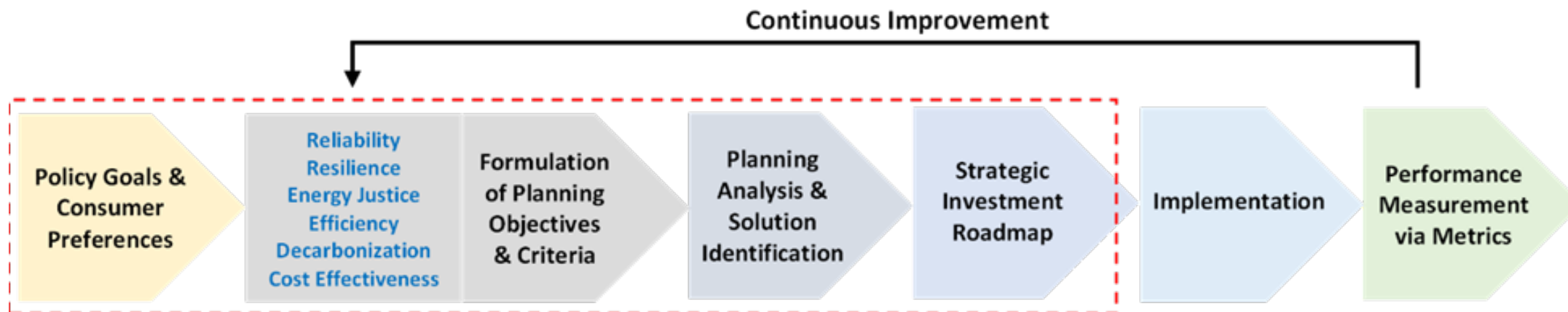
Resilience Planning

Joe Paladino
Office of Electricity
US Department of Energy

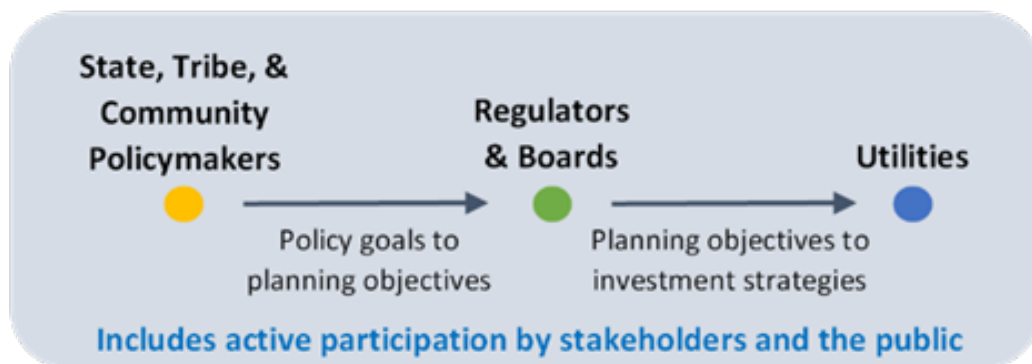
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Strategic Alignment

Alignment of policymakers, regulators, stakeholders, and utilities required to enable holistic grid planning

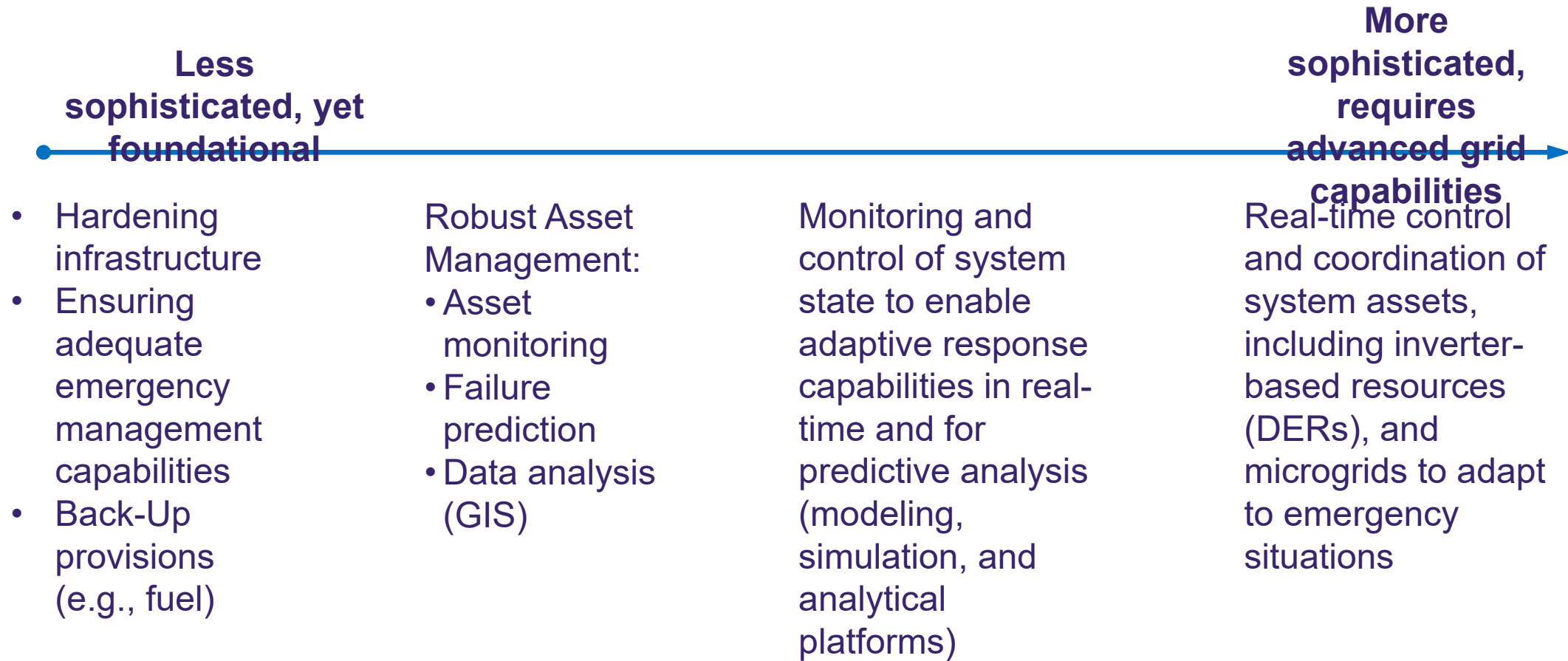


Near-term infrastructure deployment combined with long-term investment strategy



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- Asset hardening & refresh
 - Outage management systems
 - Adaptive protection technology
 - Modeling and simulation tools
 - Secure communications
 - Control/coordination of system assets and DERs
 - Application of energy storage & microgrids

Spectrum of Resilience Measures

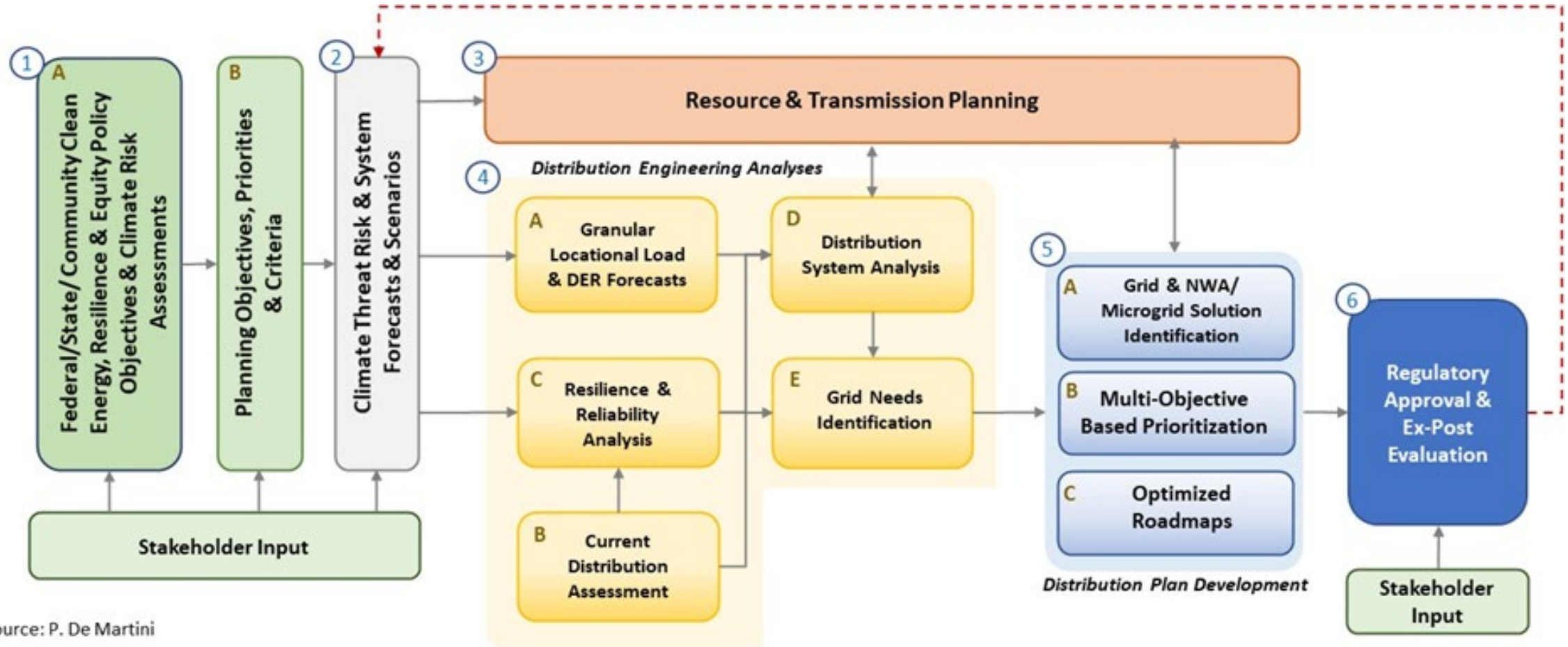


Note: FPL and more advanced utilities undertake continuous improvement of hardening and asset management practices and have built information platforms for emergency crews. Utilities e.g., PJM and Austin Energy are also implementing real-time sensing and controls to mitigate wildfires and control assets under emergency conditions. All the above activities are in play and best practices are available.



Integrated Resilience Distribution Planning Process

IDPs provide a framework for determining grid investment strategies, including grid modernization requirements, to address multiple objectives



Resilience Planning Components

Conducted jointly with stakeholders.* Utilities perform engineering analysis to determine impacts, assess gaps, and develop solution options

Determine planning objectives and metrics

Sample Objectives (from Hawaii RWG):

- Reduce outage risk during severe events
- Increase ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially catastrophic event
- Reduce restoration and recovery time following a severe event
- Optimize cost (including capital and operating costs)
- Return critical and priority customers' power within specified time
- Return power to other customers within specified time

Resilience Metric (from Hawaii RWG): Resilience Index that tracks restoration times with stated targets for critical, priority, and other customers

Identify and prioritize threats

Perform a threat assessment with key federal, state, and local stakeholders, as appropriate, to identify the potential threats and assess the risk of their probable impacts. See: FEMA Comprehensive Preparedness Guide (CPG) 201, Table 1, for a comprehensive list of threats (<https://www.fema.gov/sites/default/files/2020-04/CPG201Final20180525.pdf>)

Develop threat scenario reference cases

Develop reference cases for each threat scenario (e.g., low, moderate, severe) that characterize the threat and its impact on the grid, customers, and other critical infrastructures (e.g., hospitals, water/wastewater treatment, vulnerable individuals/populations, telecommunications, energy, and emergency services). Apply forecasts of future weather/climate threats.

Tiering and prioritization of key customers and infrastructure

Identify and prioritize key customers and infrastructure sectors with focus on system recovery and public safety and well-being:

- Develop and apply criteria for identifying/prioritizing key customers and infrastructure based on priority and urgency. Categorize by tiers, e.g., Tier 1 represents critical customers/infrastructures, Tier 2 represents priority customers/infrastructures, and Tier 3 represents all others. (Hawaii criteria are on page 40.) Criteria development is a shared responsibility of the critical infrastructure sectors.
- Alignment of tiering and prioritization needed with sectors/customers under existing emergency management, homeland security, and hazard mitigation/resiliency frameworks.

Determine capability gaps and solutions

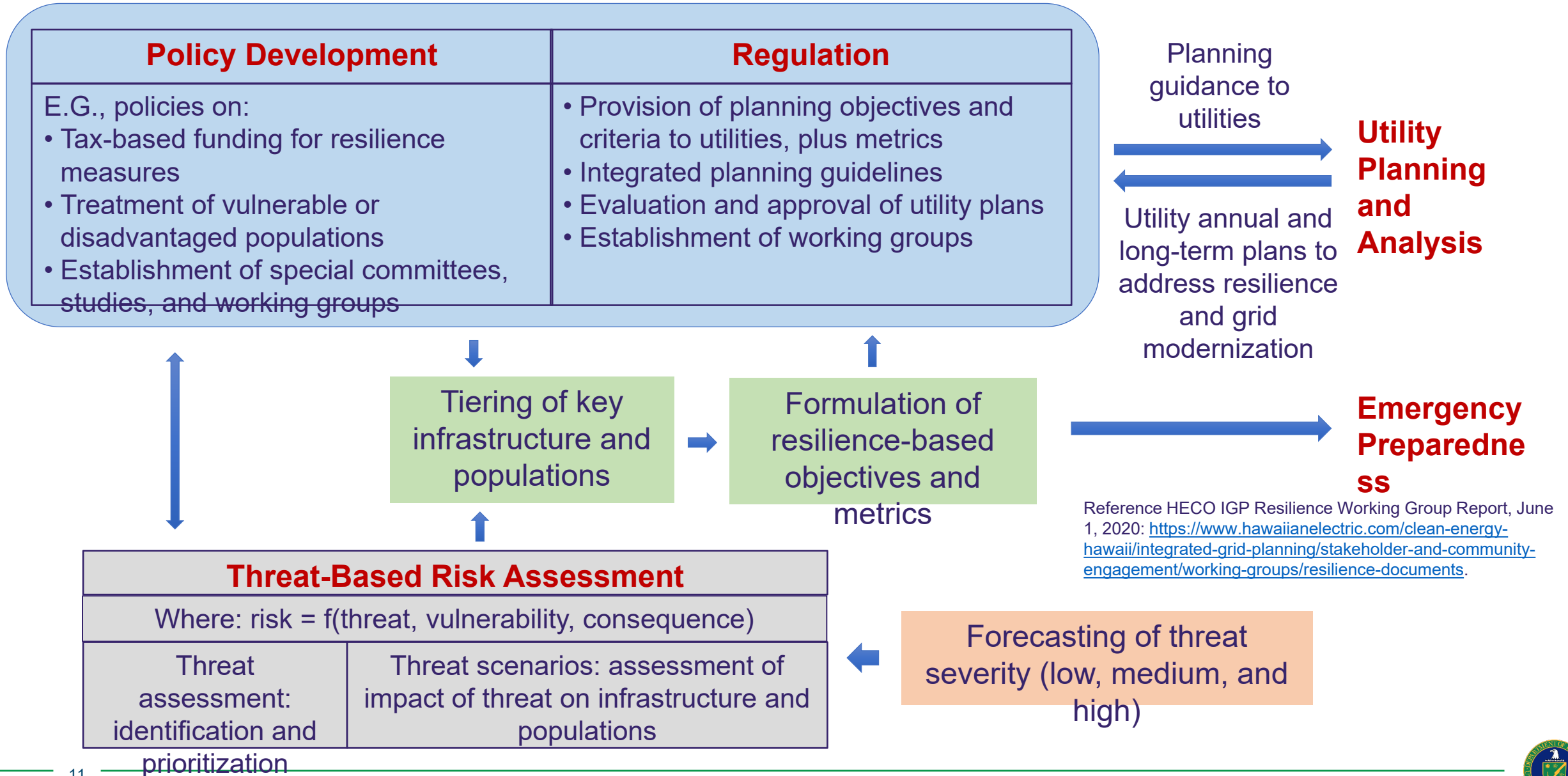
Determine gaps in capabilities, including utility capabilities and self/back-up supply capabilities and requirements, and develop solutions. Apply cost-effectiveness framework (BCA vs least-cost/best-fit). Key customers and critical infrastructure owners/operators partner with utilities, other energy companies, and the government in developing local resilience solutions that can provide resilient power for essential service providers and enhance the overall resilience of the grid for all customers in mutually beneficial projects. Considerations include:

- Implementing asset hardening practices, where needed
- Developing and implementing load management/load curtailment capabilities
- Maintaining ample onsite fuel supplies
- Deployment of temporary emergency power generators
- Partnering with utilities and the government to develop local microgrids
- Utilizing grid-forming inverters so that renewables and DERS can provide a black-start capability
- Ensuring availability of adequate road clearing equipment to speed recovery of key roads, etc.

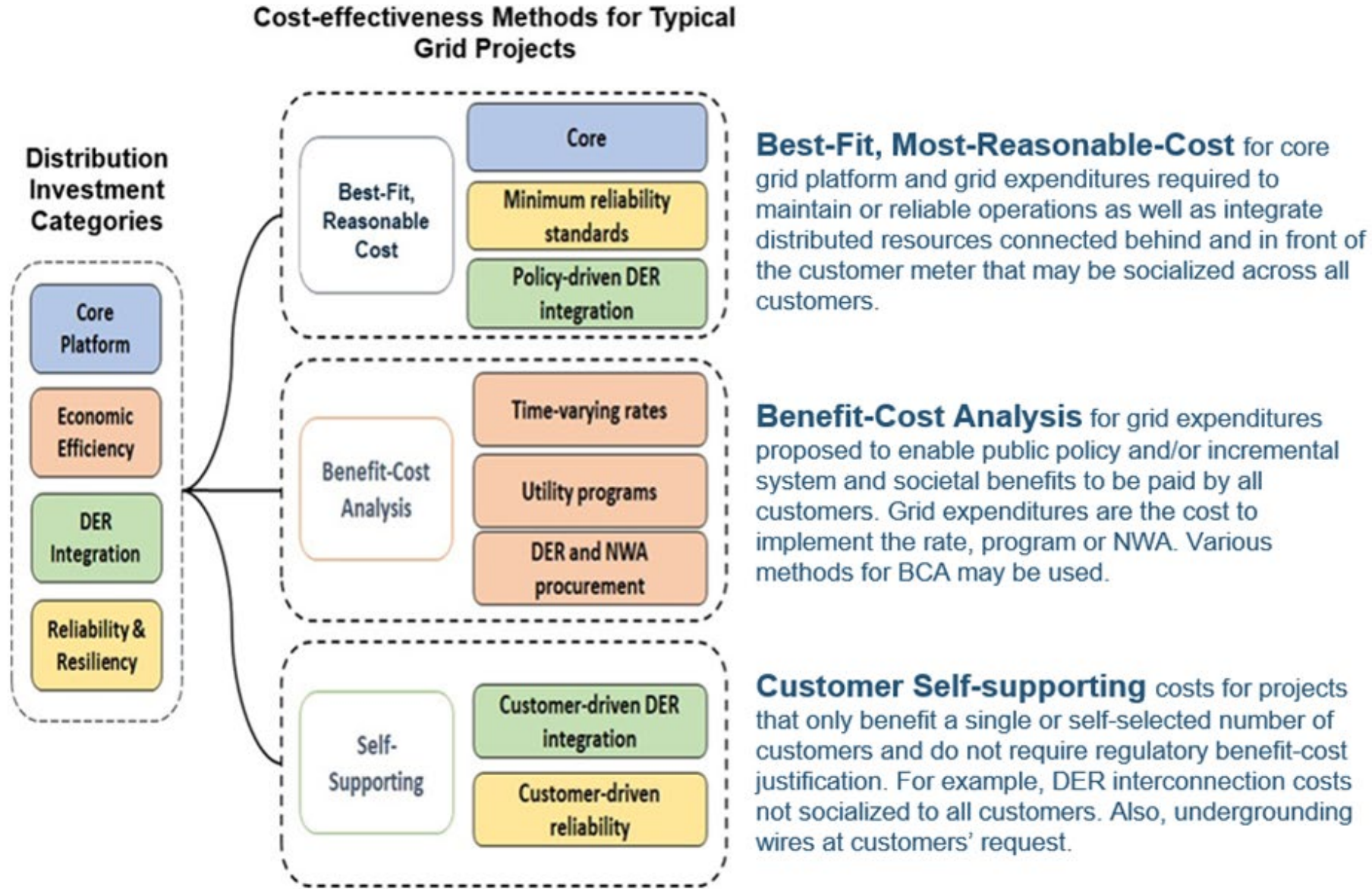
*Hawaii set up a Resilience Working Group. See June 1, 2021 report: <https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning/stakeholder-engagement/working-groups/resilience-documents>



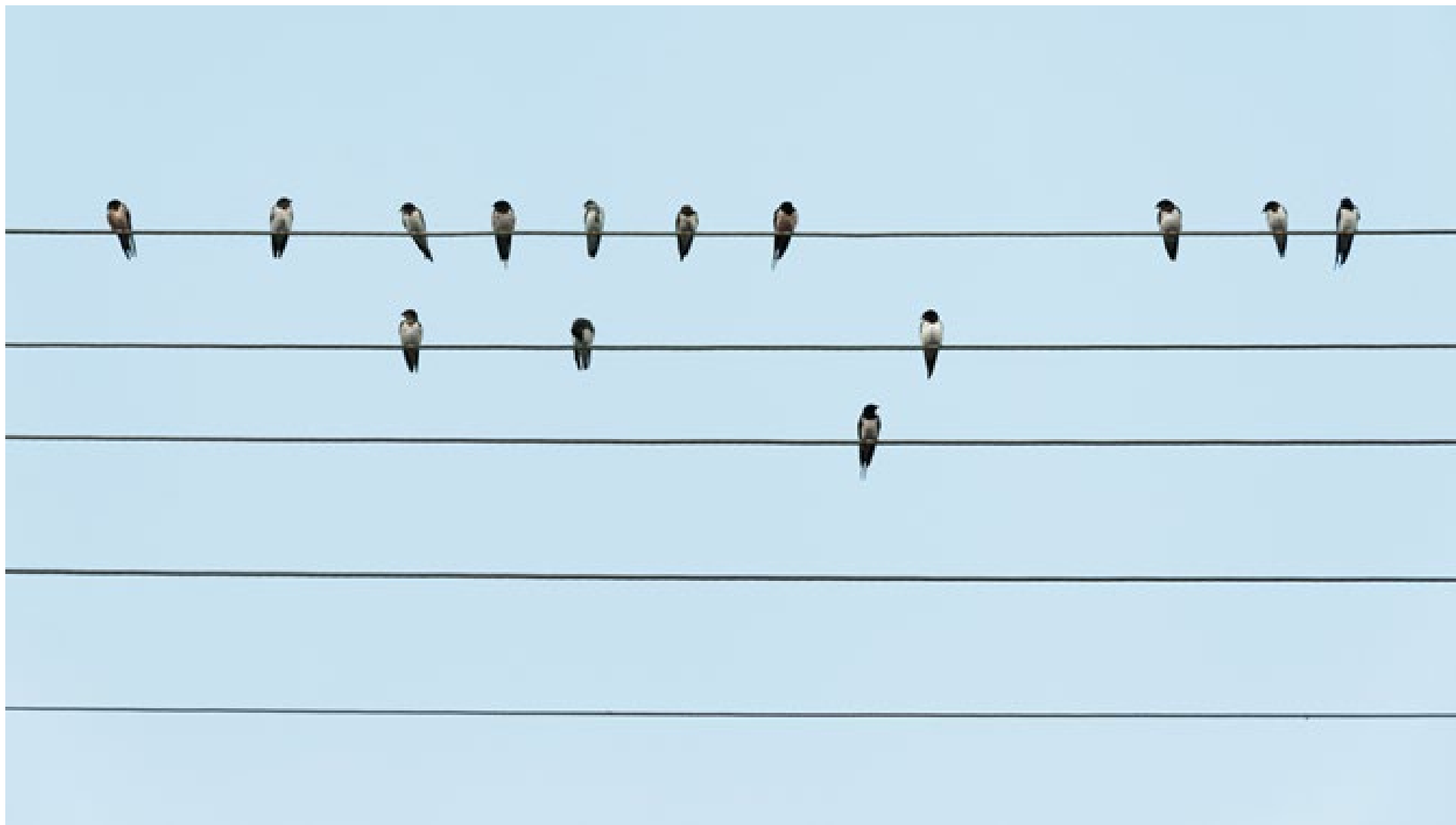
Threat-Based Risk Assessment



Grid Modernization Cost-Effectiveness Framework



Questions



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Q&A

BREAK
(5 min)



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Guest Speakers:
Ken Aramaki (HECO) & Katy Waechter (NREL)
ETIPP Update

MST Ph 2 Priority Issues:
Identifying community needs
Customer education and outreach





Hawaiian Electric Initial Hybrid Microgrid Opportunity Map to Support Community Resilience on Oahu

Microgrid Services Tariff Phase 2 Working Group Meeting

June 16, 2022

Project Timeline

December 31, 2021	Preliminary data delivery
February 15, 2022	Complete data inventory and finalize data requests
July 30, 2022	Labs present draft map to HE and Hawaii Natural Energy Institute
August-November 2022	Community engagement with HNEI, HE, and Hawaii Energy Policy Forum
December 31, 2022	Labs deliver technical report
December 31, 2022	HNEI delivers summary of community engagement activities

Hybrid MG Evaluation Criteria

DERs and Supporting Energy System Infrastructure

- Areas with existing distributed energy resources or areas with ability to accommodate additional DER operating as part of microgrid (based on hosting capacity)
- Clusters of nearby/adjacent customers on 1 feeder that could be connected in a MG with < 3 MW of total load

Hybrid MG Evaluation Criteria

Vulnerability: outage probability

- Areas prone to frequent disruptions and/or prolonged outages
 - Examples: natural hazards, limited existing backup power options, inaccessibility

Criticality: loads, facilities, and services

- Examples: Water and wastewater, hospitals, refrigeration, public safety, military services

Societal Impact: outage impact on services provided

- Examples: Disadvantaged communities, emergency shelters, remoteness, other economic factors

Hybrid MG Evaluation Criteria

Vulnerability

By feeder:

- Annual average median Customer Average Interruption Duration Index (2011-2020)
- Annual average System Average Interruption Frequency Index (2011-2020)

Other:

- Natural hazards (tsunami, flood, landslide, lava flows, wildfire risk)
- Sea-level rise

Hybrid MG Evaluation Criteria

Criticality

HE-provided:

- ~660 critical sites

Homeland Infrastructure Foundation-Level Data:

- Drinking Water Sources, Aircraft Landing Facilities, Cell Towers, EMS, Ambulatory Services, Care Facilities, EOC, Hospitals, Fire Stations, Radio Transmission Towers, Internet Exchange Points, Non-durable goods, TV transmitters, microwave service towers, Dept. of Defense sites

Other:

- Evacuation zones

Hybrid MG Evaluation Criteria

Societal Impact

HE-provided:

- Asset Limited, Income Constrained, Employed aggregation (sub-block)

Homeland Infrastructure Foundation-Level Data:

- Social assistance facilities, schools (public and private)

Other:

- Hawaiian Homelands, emergency shelters, energy burden and social vulnerability index (Census tract), disadvantaged communities*

Analysis Methods

(NREL) Spatial relation, aggregation, and clustering

- DERs
- Loads
- Priority sites (based on evaluation criteria)
- *MG feasibility*

(SNL) Power flow analyses

- By feeder, neighborhood

(NREL) Apply rankings to prioritize MG potential clusters

Community Outreach

Project team's goal is to identify which potential hybrid MG clusters are important to and supported by communities.

- Beginning to plan and open to suggestions on formats and communities

Next Steps

Complete power flow analysis

Plan community engagement activities

Cartography for Oahu hybrid microgrids map

- ◆ Coalescing heat map based on DERs and Supporting Energy System Infrastructure features
 - ◆ Unique colors for categories:
 - ◆ Vulnerability, Criticality, Societal Impact

Next meeting: July 25th

Q&A

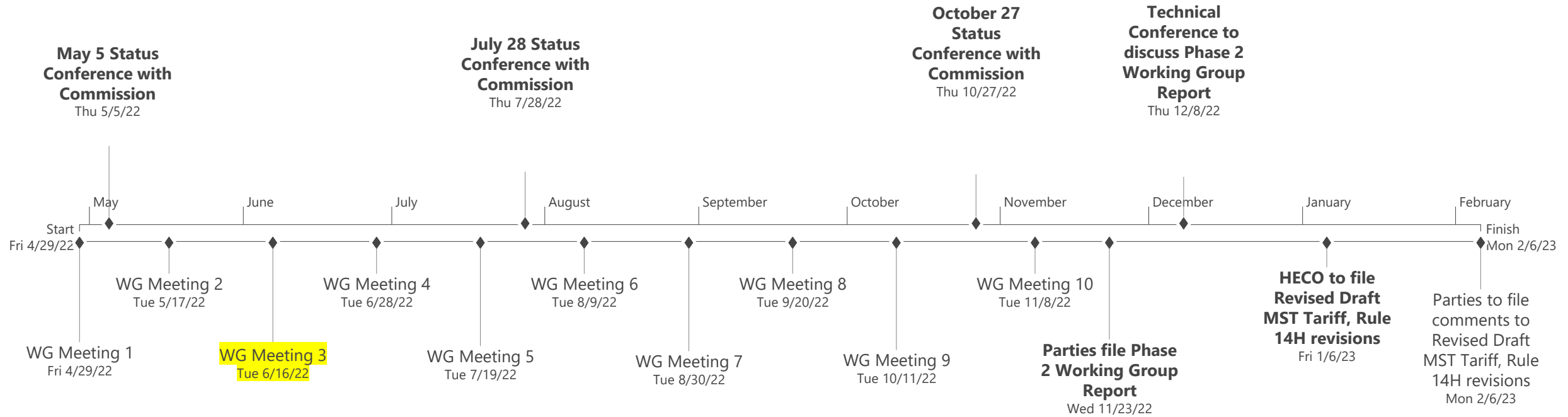
Open Discussion:

MST focus on Customer vs
Hybrid Microgrid Development



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Timeline



High Level Work Plan to Address Priority Issues

Meeting / Deadline	Date	Priority Issues
WG Mtg #1	Friday, April 29, 2022	<ul style="list-style-type: none"> • Confirm WG Objectives, Schedule, & Participants • Discuss High Level Work Plan
Status Conference	Thursday, May 5, 2022	
WG Mtg #2	Tuesday, May 17, 2022	<ul style="list-style-type: none"> • Discuss Ground Rules and WG Participant Responsibilities • <i>Working group coordination with related microgrid and resilience initiatives at Hawaiian Electric and government agencies (see slide 14)</i> • <i>Better understanding barriers to microgrid development and what would make the microgrid tariff more attractive for developers (Guest speakers from Ameresco and Holu Hou)</i> • Discuss how to prioritize issues
WG Mtg #3	Thursday, June 16, 2022	<ul style="list-style-type: none"> • <i>Resilience services and compensation, including societal and environmental value, to inform development of a resilience tariff (Guest speaker from DOE)</i> • <i>Identifying community needs (Guest speaker from NREL re: ETIPP)</i> • <i>Customer education and outreach (Guest speaker from NREL re: ETIPP)</i>
WG Mtg #4	Tuesday, June 28, 2022	<ul style="list-style-type: none"> • <i>MG Compensation and Grid Services</i> • <i>Utility Compensation/Standby charges, exit fees, and/or other charges</i>
WG Mtg #5	Tuesday, July 19, 2022	<ul style="list-style-type: none"> • <i>Identifying critical facilities</i> • Discuss how to prioritize remaining issues • Discuss how to organize report
Status Conference	Thursday, July 28, 2022	

High Level Work Plan to Address Priority Issues (cont.)

Meeting / Deadline	Date	Priority Issues
WG Mtg #6	Tuesday, August 9, 2022	<ul style="list-style-type: none"> • <i>Harmonization with other programs' grid services mechanisms</i> • <i>Customers with existing DER/DR grid service agreements</i> • <i>Customer Protection and Related Considerations</i> • <i>Interconnection</i> • <i>Identifying a variety of funding mechanisms for microgrid development. Including possible state and federal funds that can be leveraged to support pilots and/or demonstration projects</i>
WG Mtg #7	Tuesday, August 30, 2022	
WG Mtg #8	Tuesday, September 20, 2022	
WG Mtg #9	Tuesday, October 11, 2022	
Status Conference	Thursday, October 27, 2022	
WG Mtg #10	Tuesday, November 8, 2022	<ul style="list-style-type: none"> • Discuss how to finalize report and tariff revisions
Parties to file Phase 2 WG Report	Wednesday, November 23, 2022	
Technical Conference	Thursday, December 8, 2022	
HECO to file Revised Draft MST Tariff, Rule 14H revisions	January 6, 2023	
Parties to file comments to Revised Draft MST Tariff, Rule 14H revisions	February 6, 2023	

Mahalo/Appendix



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Phase 2 Priority Issues

1. Microgrid Compensation and Grid Services

- a. Harmonization with other programs' grid services mechanisms
- b. Customers with existing DER/DR grid service agreements
- c. Resilience services and compensation, including societal and environmental value, to inform development of a resilience tariff

2. Utility Compensation

- a. Standby charges, exit fees, and/or other charges

3. Customer Protection and Related Considerations

4. Interconnection

5. Working group coordination with related microgrid and resilience initiatives at Hawaiian Electric and government agencies

- a. Identifying critical facilities
- b. Identifying a variety of funding mechanisms for microgrid development. Including possible state and federal funds that can be leveraged to support pilots and/or demonstration projects
- c. Identifying community needs
- d. Better understanding barriers to microgrid development (e.g., economic, project opportunities, technical expertise) and what would make the microgrid tariff more attractive for developers
- e. Customer education and outreach

Coordination with Related Dockets/Initiatives

Docket/Project	Docket #	Hawaiian Electric POC	Next Step	Timing
DER Docket: Smart DER Tariff	2019-0323	Kaiulani Shinsato	Smart DER Tariff to replace SIA, CGS+, CSS programs	July 2023
DER Docket: Advanced Rate Design (ADR) & Time-of-Use (TOU)	2019-0323	Peter Young	Pending PUC ruling on ADR	Pending PUC D&O
DER Docket: BYOD with Compensation	2019-0323	Yoh Kawanami	BYOD proposal submitted to Commission on April 19, 2022	Pending PUC D&O; tentative program launch July 2023
RFP for Grid Services (Hawaii)	2017-0352	Yoh Kawanami	Grid Services component separated from Stage 3 all resource procurement for Hawaii island. GS RFP will follow after Stage 3.	2024?
RFP for Grid Services (Maui)	TBD	Yoh Kawanami	Draft RFP for Grid Services to be filed to Commission 6/30/22	Q3 2022
Integrated Grid Planning Resilience Working Group (IGP RWG)	2018-0165	Marc Asano	Oahu Grid Needs Assessment	Pending PUC D&O
Performance-based Ratemaking (PBR)	2018-0088			
Interconnection (IXC)	2021-0024			
Climate Adaptation Transmission and Distribution Resilience Program Application	N/A	Riley Ceria Kahikina Burgess	Application filing	July 2022
Energy Transitions Initiative Partnership Project (ETIPP)	N/A	Ken Aramaki Marc Asano	National Labs drafting map of potential hybrid microgrid sites	July 2022