

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of)
)
PUBLIC UTILITIES COMMISSION)
) Docket 2018-0163
Instituting a Proceeding to)
Investigate Establishment of a)
Microgrid Services Tariff)
_____)

OPENING BRIEF OF THE MICROGRID RESOURCES COALITION

and

CERTIFICATE OF SERVICE

Co-Counsel to the Microgrid Resources Coalition



C. Baird Brown
eco(n)law LLC
230 S. Broad St, 17th Floor
Philadelphia, PA, 19102
Office: 215-586-6615
baird@eco-n-law.net

OPENING BRIEF OF THE MICROGRID RESOURCES COALITION

I. Introduction

The Microgrid Resources Coalition (**MRC**) welcomes the opportunity to provide this opening brief and response to preliminary questions in the Hawaii Public Utilities Commission (**Commission**) proceeding investigating establishment of a microgrid services tariff. The MRC is a consortium of leading microgrid owners, operators, developers, suppliers, and investors formed to advance microgrids through advocacy for laws, regulations and tariffs that support their access to markets, compensate them for their services, and provide a level playing field for their deployment and operations. In pursuing this objective, the MRC intends to remain neutral as to the technology deployed in microgrids and the ownership of the assets that form a microgrid. The MRC's members are actively engaged in developing and operating advanced microgrids in many regions of the United States, including Hawaii.¹

II. Background

The MRC strongly supports the Commission's efforts to develop a tariff that responds to the unique capabilities and characteristics of microgrids. Because of their numerous benefits already identified in this docket, microgrids will have a major role in the grid of the future, particularly in Hawaii. In its 2014 white paper "The Commission's Inclinations on the Future of Hawaii's Electric Utilities" (the **Commission's Inclinations Report**),² the Commission provided an outline of a new business model for Hawaii utilities. That model included (i) reforming the generation system to replace oil-fired generation with new clean energy resources, (ii) creating modern transmission and distribution grids, and (iii) reforming rate structures to provide appropriate incentives to meet the first two goals. The MRC believes that microgrids will achieve a crucial role in meeting the first two goals and that this proceeding should be viewed as a part of the larger task of remaking regulatory incentives to achieve the third goal.

The legislature recognized in authorizing this proceeding, that microgrids have a unique role in the resilience of the grid through their ability to island and continue to function when the utility grid is disrupted.³ This not only preserves electric service for the customers of the microgrid but also reduces the burden on the utility grid in responding to an emergency and can preserve crucial non-electric services for the surrounding community. MRC Member Princeton

¹ The MRC is actively engaged in advancing the understanding and implementation of microgrids across the country. MRC members own significant energy assets connected to the electric grids, provide energy generation and supply services, and are undertaking microgrid construction in different locations throughout the country. MRC members include: Anbaric Transmission, Clearway Energy, Commonwealth Edison, Concord Engineering Group, Eaton, ENGIE, ICETEC Energy Services, Inc., Massachusetts Institute of Technology, NRG Energy, Inc., Princeton University, Thermo Systems, University of Missouri, and University of Texas at Austin. The MRC is affiliated with the International District Energy Association ("IDEA"), which connects members from all over the country operating combined heat and power plants and microgrids. This filing reflects the position of the MRC as an organization and should not be construed to reflect the positions of any individual member.

² Hawaii Public Utilities Commission, *The Commission's Inclinations on the Future of Hawaii's Electric Utilities*, published 2014. (hereinafter "Commission's Inclination Report") The legislature has now asked the Commission to go forward and implement its vision. *See*, Haw. Rev. Stat. §269-16.1 (2018).

³ *See* H.B. 2110, 29th Legislature (Ha. 2018).

University not only kept the lights on (and the research labs running) during the weeklong blackout caused by hurricane Sandy in 2012, but also provided hot meals, hot showers and cell phone charging to first responders from the surrounding community.⁴

Microgrids typically manage not only included electric loads but other energy use and utility consumption within their boundaries as well. Co-managing thermal loads and water usage with electrical loads can provide substantial efficiencies in fuel use that assist in reducing greenhouse gas emissions. As a part of that effort, microgrids often include advanced building and process controls and both thermal and electric storage that not only create fuel efficiencies but also permit load shaping in response to grid needs or price signals. Microgrid demand response is an integrated response including generation, storage and load.

The ability of microgrids to manage their integrated resources allow them to inherently address other forms of variability. Microgrids can balance intermittent solar and wind production and can also integrate vehicle charging loads. Hawaii used more fuel oil for land transportation than it did for electric generation in 2018.⁵ Meeting Hawaii's carbon emission goals⁶ will require transformation of the transportation sector as well as the electricity sector and will result in substantially greater overall electricity demands. Microgrids can provide a structure for meeting charging loads and potentially harness energy from vehicle batteries and other sources in an emergency.

Resilience is inherently local. Communities and customers understand their critical needs for health, safety, and the preservation of economic activity. Reliability analysis of the utility power system treats all local uses alike – no distinction is made between cooling a movie theater, a critical care nursing facility or refrigerated research specimens – and collective measures such as aggregate loss of load or average outage duration do not capture resilience where it matters. The goal of resilience planning must be to ensure that the entire grid system works to protect our communities. Thinking from the community up will result in the evolution of grid architecture. Self-managing microgrids are the fundamental building blocks of a resilient system. Utilities will implement distributed energy resource management systems (**DERMS**) that can reconfigure the distribution system in response to disruption and allow local resources to support critical substations and circuits. The ability of the distribution system to act as a first line of defense in disruptions by incorporating local generation and storage, intelligent emergency load shedding by customers and communities, and local, temporary reconfiguration of the grid will define the next generation power grid.

Hawaii, along with Puerto Rico and the District of Columbia, are leading the effort to integrate microgrids into their overall scheme of regulation. The MRC hopes it can be helpful in that process.

⁴ Daily Princetonian, *Princeton's Cogeneration Plant Provides Power During Hurricane*, YOUTUBE (Nov. 1, 2012), <https://www.youtube.com/watch?v=WtjIj91imSQ&feature=youtu.be>.

⁵ The ground transportation sector uses twenty seven percent of all petroleum consumed in Hawaii, and the electric power sector uses twenty five percent. Hawaii State Energy Office, *Hawaii Energy Statistics*, available at <http://energy.hawaii.gov/resources/dashboard-statistics>.

⁶ See Office of Information Management, *Green House Gas Mitigation*, visited Feb. 6, 2019, available at <https://dashboard.hawaii.gov/stat/goals/5xhf-begg/ezet-axai/edup-hdhh>.

III. Commission Questions

The MRC provides the following answers to the Commission's initial questions:

1. How should the term “Microgrid” be defined for purposes of the microgrid services tariff?

We suggest adopting the definition directly from HB 2110,⁷ essentially without qualification, as follows:

“Microgrid’ means a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the utility's electrical grid and can connect to a public utility's electrical grid to operate in grid-connected mode and can disconnect from the grid to operate in island mode, and otherwise meets the requirements of this tariff.”

2. What characteristics of microgrids (e.g., islanding capability, generation resource types, size, etc.) should be included in the definition of microgrid?

We do not suggest including other characteristics in the definition as such. The MRC does suggest the adoption of additional qualifications for participation in the Microgrid Tariff by requiring that a microgrid:

- a) Support Most Included Load. The microgrid’s generation must be capable of meeting a substantial proportion of the included load on a sustained basis (a backup generator is not a microgrid, though a microgrid may include backup generation). Otherwise resilience is not accomplished.
- b) Is an Effective Control Area. The microgrid controller must be capable of managing the included load (including shedding internal load as needed) so that the included generation and storage resources can safely and consistently balance in island mode.
- c) Meets Grid Standards. The microgrid must meet interconnection and grid communication technical standards so that it can operate safely while islanding and resuming parallel operation and while providing services that it elects or is selected to

⁷ HB 2110 defines “microgrid project” as follows: "Microgrid project" means a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the utility's electrical grid and can connect to a 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 a microgrid services tariff; and
- (2) Generates or produces energy.

We are not sure what is added by clause (2), and clause (1) is captured by the final clause of our proposal.

provide to the grid.

- d) Has a Single Point of Responsibility. A single entity should speak for and be financially responsible for the microgrid (the **Microgrid Operator**). The utility and the Commission should be entitled to rely on the Microgrid Operator for communications and obligations of the microgrid. The Microgrid Operator can be an owner, an operator, a homeowners' or community association or other entity, so long as it is duly constituted, and, if it takes on obligations to provide grid services, can meet credit criteria for participation.

We generally oppose other types of limits with certain exceptions:

- e) Generation Resource Type. Hawaii has adopted policies to achieve 100 percent renewable energy by 2045. In general, we support applying the same standards to microgrids as to all other generation. However, there may be situations where it makes sense for a microgrid cogeneration facility to be fueled by LNG. Modern cogeneration facilities can achieve 85 percent efficiency compared with around 55 percent for modern gas-fired electric-only generation and around 35 percent for United States generation on average.⁸ LNG-fired cogeneration facilities for large thermal loads such as industrial or medical facilities should be considered to avoid waste heat from thermal only fuel conversion without diminishing the 100 percent RPS. The cogeneration plant at MRC Member Princeton University provides frequency regulation to the PJM grid with a two second response time in addition to providing power, heating and cooling (with steam chillers) to its campus.
- f) Size. We do not support size limitations. MRC member University of Texas at Austin operates a microgrid with over 100 MWs of capacity. Household microgrids with solar, batteries and comparatively simple controls may be limited to grid participation through an aggregator, or to products and services for which they have sufficient communications and controls as suggested in c) above,⁹ but they should not be excluded.

3. What ownership structures should be included in the microgrid services tariff (e.g., customer-owned, cooperative, third-party, utility-owned, etc.)?

The MRC recommends that the microgrid services tariff should focus on microgrids developed and owned by customers or by third-party providers for the benefit of the customers. The tariff should establish the relationship between the utility and the Microgrid Operator for each microgrid. HB 2110 specifically provides that “Any person or entity may own or operate

⁸ Center for Climate and Energy Solutions, Climate Techbook: Cogeneration/Combined Heat and Power (CHP), available at <https://www.c2es.org/technology/factsheet/CogenerationCHP>; EPA Combined Heat and Power Partnership, Efficiency Metrics for CHP Systems: Total System and Effective Electric Efficiencies, available at https://www.arb.ca.gov/cc/ccei/presentations/chpefficiencymetrics_epa.pdf; U.S. Energy Information Administration, *Form EIA-860, 'Annual Electric Generator Report'*, Table 8.2. Average Tested Heat Rates by Prime Mover and Energy Source, 2007 – 2017, available at https://www.eia.gov/electricity/annual/html/epa_08_02.html.

⁹ This is consistent with the HECO Customer Grid Supply Plus Program, a summary of which is available at <https://www.hawaiianelectric.com/products-and-services/customer-renewable-programs/customer-grid-supply-plus>

an eligible microgrid project.”¹⁰ We suggest that the form of private ownership should not be a source of distinctions,¹¹ but the purpose of the tariff should be to establish the terms for and to encourage privately owned microgrids.

- a) Private Investment. Private ownership of microgrids provides many benefits to ratepayers, utilities, and the microgrid customer. We have discussed the benefits to customers at some length in the Part II (Background). Those benefits lead private parties to develop, own, and operate microgrids using private investment. Privately supported microgrids, in turn, provide a range of services to the utility grid, ranging from relief of local stress to gridwide energy and ancillary services, at prices below what standalone facilities (or additional wires assets) would be able to provide. This saves money for all ratepayers. Private investment also shifts operation and maintenance cost and risk away from the utility and the general rate base onto the Microgrid Operator.
- b) The Microgrid Tariff. The primary purpose of the microgrid tariff, in addition to providing interconnection standards, would be to establish a framework for delivery of services from the microgrid operator to the utility. As suggested below, the framework could include¹² (i) flat or formula priced services tariffs such as HECO’s Smart Export Program,¹³ (ii) structure for auction markets for specific services, and (iii) procedures and requirements for individualized grid support services contracts between a microgrid and a utility. It would include microgrid operational requirements (discussed further below) that a microgrid operator must meet in order to provide particular services under the tariff to assure safe and seamless operation with the utility. It could establish financial security requirements for microgrid operators providing services and the consequences of failure to perform. The risk of performance is on the microgrid, and the benefits flow to the utility and the ratepayers.
- c) Operational Benefit. To attract private investment, the microgrid operator must be able to operate principally for the benefit of the microgrid customers, but subject to the incentives of the microgrid tariff. The Microgrid Operator can island the microgrid, manage the integrated energy efficiency of the load, generation and storage within the microgrid, and sell services to the utility all to optimize the price and service to its customers. A customer-operator can simply implement its own choices, or a third-party operator can act under a concession contract with its customers. A concession contract will typically involve mandatory standards and incentive terms to guide the operator and/or provide a degree of direct customer control. The utility cannot, without conflict of interest with its other customers, perform this management function, or, indeed, take non-electric management or community resilience into account. Pricing mechanisms

¹⁰ See Haw. Rev. Stat. §269-46(b) (2018).

¹¹ So long as the Internal Revenue Code offers tax credits for solar and certain other forms of renewable energy, there will be reasons for the tax-owners of microgrid projects (or portions of them) to be persons who are neither the operators nor the customers of the microgrid. In addition, considerations of risk and finance may lead even large sophisticated customers to seek a third-party owner-operator to develop a microgrid for them. The Commission should not make distinctions between such microgrids.

¹² Or it could incorporate by reference.

¹³ Hawaii Electric Company, *Smart Export*, available at <https://www.hawaiianelectric.com/products-and-services/customer-renewable-programs/smart-export>

established in the tariff (or incorporated from other more general tariffs) will provide incentives for microgrid behavior that benefits grid customers as a whole. The operator can then maximize the benefits for itself or its customers based on the incentives provided by the tariff.

- d) Technology Advance. Finally, private ownership allows for greater flexibility and better risk management in implementing changes in technology. Grid support service contracts of 10 to 20-year duration accommodate potential technological advancements that may be developed in the future. Instead of long-term fixed capital investment by the utility whose costs may be borne by ratepayers for 30 to 40 years through the rate base, a smaller investment is made with a shorter-term contract. Technology is rapidly advancing and making 30-plus year investments less practical than they once were. Microgrid technology is advancing very rapidly. Microgrid Operators should plan for a shorter capital investment cycle. Third party Microgrid Operators are specialists in their field and can adapt to changes in technology more quickly than utilities, keeping operating services in-house and training their existing employees on new technologies. This model will foster greater innovation, drive down costs, and help achieve true market transformation to the benefit of the grid and all ratepayers.

- e) Hybrid Microgrids. One role that utilities may play in the microgrid arena is through utility-private partnerships for hybrid microgrids. Typically, the utility provides the use of its distribution wires to a private third-party developer who owns or controls the included generation and storage and manages the microgrid for the benefit of the customers. For most purposes this microgrid should be treated as a privately-owned microgrid under the tariff, subject to the same terms as any private microgrid. There are, however, two additional issues that arise which it may be appropriate to manage through the tariff.
 - i.) The tariff or a separate contract governed by the tariff must establish terms and conditions for the use of the of the utility's wires. This includes construction and operation of the islanding switchgear, and the use of the portion of the distribution system included in the microgrid when it operates in island mode. In island mode the microgrid operator, not the utility, is acting as the control area operator for the microgrid. These charges should reflect actual cost and a fair return on capital to the utility, and the tariff should establish a mechanism for insuring that costs are not inflated. It is reasonable to ask the microgrid to pay the initial cost of installing the islanding switchgear and to provide its own financing.

 - ii.) For billing purposes, the Microgrid Operator is the retail energy supplier to its included customers.¹⁴ The microgrid as an entity would be the wholesale customer for any import of power and would be the wholesale seller for any export of power. In a retail choice jurisdiction on the mainland, the utility (which owns the meter as well as the wires) could retain the billing responsibility for

¹⁴ The customers could range from a consortium of large customers in an industrial district to a geographic segment of the grid with a full range of customers. We discuss further below what that means for residential and small business customers.

customers included in the microgrid and would bill as a pass-through the microgrid's energy and other charges as well as the utility's own charges for the distribution system. The Commission may wish to include such a process in the tariff to enable hybrid microgrids.

Other kinds of hybrid microgrids may implement more complex contractual structures with mixed incentives and may require individual tariffs or grid support services contracts as further described below.

4. What microgrid services or functions should be considered in developing the microgrid services tariff?

We have described relevant microgrid functions in broad terms in the Part I (Background) above. Those functions allow the Microgrid Operator to deliver a wide variety of services. Regional Transmission Organizations (**RTOs**) on the mainland procure energy and capacity and a wide variety of ancillary services, including reserves, load shifting, frequency response, and voltage control,¹⁵ through auction markets. These services support the operation of the bulk power system over wide areas. Similar markets at the level of individual utilities are comparatively rare but could certainly be implemented at an appropriate scale and scope. HECO currently implements fixed tariff programs including (i) its Smart Export Program, a fixed-price energy purchase program during hours when solar energy production is low, (ii) its Customer Grid Supply program, which is phasing out, and (iii) its Customer Grid Supply Plus Program, which requires resources to be capable of monitoring and dispatch.¹⁶ These programs are aimed primarily at residential rooftop solar; they provide inflexible price signals; and they are aimed only at energy production. They do not begin to take advantage of the flexible capabilities of microgrids.¹⁷

While it is important to develop utility markets, they need not take the same form as current RTO markets. As an example, where local resources can improve the stability of a substation or decrease pressure on a radial circuit, or support essential community and distribution grid control services, the MRC has suggested that the utility run a Request for Proposals for resources that can provide “**grid support services.**” Procuring customized services on a mid- to long-term contracted basis often provides a cost-effective alternative to a utility implementing a traditional physical system capacity upgrade (often called a **wires solution**). Competition for long-term contracts assures fair pricing, and respondents to RFPs may well have more knowledge around technical solutions and the economics of those solutions that depend on optimizing customer systems to respond to the grid's planning and operational needs. Such contracts provide strong support for financing. Services under the contract can be tailored to meet the particular needs of the distribution system in emergencies or in daily operation. The Commission can

¹⁵ See HB 2110, *supra* note 3 at Section 1.

¹⁶ For a summary of the program, see Hawaiian Electric, *Customer Grid Supply Plus*, available at <https://www.hawaiianelectric.com/products-and-services/customer-renewable-programs/customer-grid-supply-plus>.

¹⁷ Similarly, we do not view the PPA process under Haw. Rev. Stat. §269-27.2 as providing an appropriate, flexible process for capturing the benefits that microgrids can provide.

permit the utility to treat the long-term contract as a regulatory asset with a return that makes them indifferent to implementing a wires solution.¹⁸

The California Public Utilities Commission has taken the lead in requiring that distribution utilities identify the locations on their system where DERs can make a contribution and is exploring how to compensate distribution utilities so that they are indifferent between the distribution support service solution and the wires solution.¹⁹ The Potomac Electric Power Company's filing with the Maryland Public Service Commission for public purpose microgrids, proposes to acquire generation resources for the microgrids through RFPs and to treat the contracts for microgrid generation services as regulatory assets.²⁰ The MRC supports these approaches.

The MRC also suggests consideration of a process for unsolicited proposals from DER providers to meet needs identified in a distribution system plan. In particular, we suggest a model based on Virginia's Public Private Transportation Act, which allows private developers to make unsolicited proposals to resolve transportation system issues identified in state and regional transportation plans. This statute permits but does not require that unsolicited projects be bid out before they are awarded, in the discretion of the relevant public planning agency. In this context, we assume that the Commission would either directly approve or give policy guidance on when a supplier would be permitted to proceed with a non-competitive procurement based on factors such as the quality of the proposal and the urgency of the need. This has been a successful model in Virginia for over 20 years.

5. Should microgrid owner/operator be required to provide minimum set of services to its customers/subscribers? If so, identify those services, including level of service, where applicable.

The basic requirements for a microgrid are suggested by the definition provided in response to Question 1 and our further response to Question 2 above: it reliably meets the energy needs of its customers and it can operate as an island when the utility grid is disrupted. No other services should be required, though they should be encouraged. Integrated management of thermal and electric energy and other utility services should be strongly encouraged but may be beyond the Commission's jurisdiction in some instances. For microgrids operated to benefit a single large customer or for a group of large customers, the customer(s) can be anticipated to be responsible for serving their own needs or contracting for third parties to adequately serve them. One obvious conclusion from the Commission's technical conference held January 9, 2019, is that there is a competitive market in the state to provide microgrids for such customers. The MRC believes that letting sophisticated customers make their own deals will best promote the expansion of microgrids.

¹⁸ In the experience of MRC members, some utilities use RFP processes as vehicles to obfuscate and delay. Incentive ratemaking should be based on actual contracts entered that bring value to ratepayers, not numbers of RFPs launched.

¹⁹ *California Independent System Operator Corporation's Distributed Energy Resource Provider Initiative*, 155 FERC ¶ 61,229 (June 2, 2016).

²⁰ Potomac Electric Power Company, *Updated Proposal for a Pilot Program to Create and Evaluate Public Purpose Microgrids*, Maryland Public Service Commission Case No. 9361, February 15, 2018.

6. How should existing tariffs/programs (e.g., Smart Export, Demand Response, CERE, etc.) be coordinated and harmonized with the microgrid services tariff, if at all? The Parties are encouraged to map out and identify the existing tariffs and programs already addressing and/or providing guidelines for services relevant to microgrid.

As an initial matter, statutory restrictions on implementation of microgrids are perhaps the biggest barrier to expansion. To the extent that the Commission can work with the legislature, it should seek to assure that there are no legal barriers to sale and delivery of power by microgrids to their included customers. The Hawaii utility code exempts from the definition of “public utility” a renewable energy system that (i) is located on a customer’s property, or (ii) operated by a landlord for its tenants.²¹ It will often make sense for technical, economic or resilience reasons for a microgrid to serve multiple co-located customers who do not share a property ownership or a tenancy relationship. The restrictions imposed by the public utility definition relating to exclusion of landlords would also interfere with creative hybrid microgrids described above in part e) of our response to Question 3. In addition, as described above, a microgrid is far more than simply a “renewable energy system” and is likely to include storage, demand response, non-renewable backup generation that is required by law, or needed for black start capability, and, where permissible, cogeneration.

The Commission should work to assure that definitional barriers do not prevent advanced, multi-customer microgrids from being established. We suggest that the definition of utility should simply exclude microgrids. Microgrids should also not be subject to utility-style regulation.²² Where the customers are all sophisticated commercial and industrial customers, they should be entitled to establish their contractual relationship with the Microgrid Operator on their own terms. Where a Microgrid Operator is a governmental unit, community association or homeowner’s association, or a third-party under contract to such a group, the group should also generally be able to act for itself. Where a microgrid has residential or small business customers that are not collectively represented, it may make sense to retain price protection and disclosure requirements similar to those contained in the Hawaii landlord exception.

The MRC strongly supports the Commission’s approach in the Commission’s Inclinations Report that DER customers should “pay for grid services they *utilize* and receive compensation for various grid support services they *provide*.”²³ The Commission should move to conform existing programs to this standard. This will necessarily require unbundling of services, which we believe is broadly consistent with incentive ratemaking. We believe that the Smart Export Program barely reaches this bar. We agree that prior net metering programs did not meet it at all. Our discussion above about auction markets and procurement processes are

²¹ Haw. Rev. Stat. § 269-1 (2018), definition of “utility” exemptions (M) and (N).

²² We respectfully disagree with the approach taken by Puerto Rico, which requires microgrids operated by third parties to be subject to rate review on a traditional utility basis and imposes something akin to an obligation to serve for customers located near the microgrid. Puerto Rico “Regulation on Microgrid Development,” Sections 5.13 and 5.10. See <http://energia.pr.gov/wp-content/uploads/2018/05/Resolution-Adoptation-of-Microgrid-Regulation-Final.pdf> The MRC believes that this approach will impose substantial impediments on the development and financing of microgrids.

²³ Commission’s Inclinations Report at 25.

intended to suggest ways forward to more nearly achieve this goal.

- 7. How should interconnection standards and procedures be modified, if at all, to enable the safe and reliable integration of microgrids with Hawaii's electric grids (including development of new standards and procedures if necessary). The Parties are directed to answer, with specificity and supporting details, the following questions, at minimum: What guidelines should be included in the microgrid services tariff with respect to interconnection? How would the Hawaiian Electric Companies' Rule 14.H., "Interconnection of Distributed Generating Facilities with the Company's Distribution System," need to be modified, if at all?**

The MRC recommends that the microgrid tariff include guidelines for interconnection of microgrids that deal with particular capabilities of microgrids.

- a) A Microgrid should be allowed to negotiate an interconnection capacity that is less than the aggregate capacity of the included generators (and storage discharge capability) based on the ability of the microgrid's hardware and/or software to control to a chosen capacity point or to a signal from the utility (the latter should be a compensated service).
 - b) A microgrid should not pay standby charges for load it is capable of shedding internally. A multi-customer microgrid will have internal contractual arrangements for priority in internal load shedding. Such rules, which could involve separate pricing regimes, should be respected. They do not constitute customer service failures, but intended modes of operation considering the capabilities of the microgrid.
 - c) Flexibility should be allowed in the metering solution to utilize virtual metering (or an algorithm) and existing infrastructure where possible.
 - d) When grid connected, inverter-based devices should operate in compliance with UL-1741-SA.
 - e) In situations requiring restoration of the utility grid, timing for reconnection should be coordinated with the utility or subject to a utility-promulgated protocol.
 - f) Hawaiian Electric Companies' Rule 14.H should be updated by adding the definition of a microgrid and referencing the technical requirements of the microgrid tariff. The Interconnection Process discussed in Section 4 should have a bullet "e" added to reflect that microgrid interconnections should follow the process for Distributed Generation Facilities described above in steps a – d, but that, accommodations should be made to account for how microgrid capacity is calculated and how microgrid controls will limit the parameters of microgrid operation.
- 8. What other provisions, if any, should be considered in developing microgrid services tariff?**

The MRC suggests that the Commission adopt two specific tariff provisions to support microgrid development: a public benefit type payment for the benefits of islanding capability and a basic, optional grid support services tariff. The purpose is to establish reasonable certainty for microgrid developers as to the economics they can expect. The role of the utility must evolve to take advantage of the capabilities of microgrids.

- a) **Part 1 – Public Benefit Payment.** This payment would be made in recognition of the resilience benefit of microgrids and the ability to island in response to a grid emergency.
 - i.) Part one is a payment to microgrids capable of operating as an island based on the included load that is islanded. This could be based on an annual average load in the microgrid served by both internal and external sources. (Alternatively, it could be based on average imports or some measure of peak load.) No distinction should be made between load served and load shed in island mode, but an application for the payment could require credible ability to serve critical internal loads. The criteria would also include a minimum islanding capability of, for example, two to five days (not just a battery or a back-up generator). There could be a bonus for longer capabilities. Other minimum capabilities such as telemetering and grid communication should be considered.
 - ii.) Selection of microgrids for payment would be made from an annual budget or budget maximum to prevent rate shock. The budget would be allocated through a combination of screens. Any Microgrid Operator could apply for annual payments for a period of years up to a maximum number of years (e.g fifteen years). The maximum annual payment per islandable kWday could vary depending on whether the microgrid included FEMA identified critical loads, but we are reluctant to suggest limiting the program to “public purpose” microgrids, because the aim is spread microgrids broadly. We also don’t suggest limiting the scope of microgrids to single critical facilities where broader ones would make sense.
 - iii.) The budget for the year would be allocated through a combination of (i) initial minimum qualifications, (ii) preference for lower cost (per kWday) offers, (iii) some minimum proportion based on a regional allocation process (such as by distribution service territory on the basis of total load) and (iv) a preference mechanism for FEMA critical loads. Since long-term payments are contemplated, the budget would grow with time, and that would have to be contemplated and managed. Funds could be allocated on a quarterly cycle to permit timely processing of applications. The hope is to have a semi-automatic process with as little red tape as possible.
 - iv.) Funds for the budget could be raised through a public benefit charge or could also come from state budgets or dedicated sources such as a carbon tax.
 - v.) Once an award is made it would be effective for the term awarded. The award would lapse if the islanding capability and capacity is not maintained.

- vi.) The policy behind this proposal is to drive the entire grid toward tiled microgrids, perhaps over a specific timetable.
- b) Part 2 – Basic Grid Support Services.
- i.) The second microgrid support tariff element would be a basic grid support services agreement for which any microgrid meeting minimum criteria as described above would be eligible. Eligibility would not be limited to microgrids receiving support under Part 1, and previously existing microgrids would be eligible. This tariff would provide payments to any microgrid that agrees to provide basic grid support services based on the same aggregate measure of capability described in Part 1. The minimum service would be (i) agreement to coordinate with the grid operator while entering or leaving island mode and (ii) agreement to be dispatchable down (reducing the microgrid’s load served by the grid) to any level, including zero, up to a maximum number of hours per year (say 100) during emergencies (but not longer at any one time than the microgrid’s stated duration capability).
 - ii.) Being dispatchable down should not affect load measurement for purposes of allocating transmission or standby charges. A microgrid would be permitted to reduce load below the dispatch point when dispatched and also reduce when not dispatched.
- a) The Utility Platform. The role of the utility is to deploy grid control infrastructure such as DERMS that can take advantage of the capabilities of microgrids. In moving forward with implementation of the Commission’s Inclinations Report, the Commission, should adopt incentives tied to measures of microgrid deployment and utility progress in adapting the grid to take advantage of the services provided by microgrids.

IV. Conclusion.

Microgrids can provide many benefits to individual customers, utilities, and ratepayers in the state of Hawaii. A microgrid services tariff will enable quicker and more efficient deployment of these technologies, leverage private investment to provide a public service, shift risk away from the utility and general rate base, and help Hawaii achieve its aggressive climate policy goals. Microgrids support the development of a decentralized, decarbonized, and resilient electric grid that is critical to ensuring Hawaii can reach its goal of 100 percent renewables by 2045 to help mitigate the impacts of climate change and provide a sustainable quality of life for all Hawaiians. Hawaii is the leader in clean energy development and sustainability and serves as a model for the rest of the U.S. to follow.

MRC applauds the Commission on its leadership in working towards decarbonization and sustainability in Hawaii and appreciates the opportunity to provide comments in this important docket.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the OPENING BRIEF OF THE MICROGRID RESOURCES COALITION was duly served as follows: certified U.S. mail, postage prepaid of the original plus eight hard copies to the Commission, two copies to the Consumer Advocate and the Hawaiian Electric Companies, and first class U.S. mail, postage prepaid of one copy each to the remainder.

RANDALL IWASE, CHAIRPERSON
PUBLIC UTILITIES COMMISSION
465 South King Street, Room 103
Honolulu, Hawaii 96813

DEAN NISHINA
EXECUTIVE DIRECTOR
DIVISION OF CONSUMER ADVOCACY
DEPT. OF COMMERCE & CONSUMER AFFAIRS
P.O. Box 541
Honolulu, Hawaii 96809

KEVIN M. KATSURA
MANAGER, REGULATORY NON-RATE PROCEEDINGS HAWAIIAN
ELECTRIC COMPANY, INC.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

ERIK KVAM
PRESIDENT
RENEWABLE ENERGY ACTION COALITION OF HAWAII, INC.
4188-A Keanu Street
Honolulu, HI 96816

CHRIS DEBONE
PRESIDENT
DISTRIBUTED ENERGY RESOURCES COUNCIL
Hawaii Energy Connection
99-1350 Koaha Pl.
Aiea, HI 96701

CARLITO P. CALIBOSO
DAYID A. MORRIS
YAMAMOTO CALIBOSO
1100 Alakea Street, Suite 3100
Honolulu, HI 96813
Council for THE ENERGY FREEDOM COALITION OF AMERICA, LLC

WILLIAM J. ROLSTON
DIRECTOR - ENERGY ISLAND
73-4101 Lapa'au Place
Kailua Kona, Hawaii 96740-8424

HENRY Q. CURTIS
VICE PRESIDENT OF CONSUMER AFFAIRS
LIFE OF THE LAND
PO BOX 37158
Honolulu, Hawaii 96837-0158

HENRY CURTIS
VICE PRESIDENT FOR GOVERNMENTAL AFFAIRS
r PUNA PONO ALLIANCE
P.O. Box 37313
Honolulu, Hawaii 96837-0158

GERALD A. SUMIDA
ARSIMA A. MULLER
Carlsmith Ball LLP
ASB Tower, Suite 2100
1001 Bishop Street
Honolulu, HI 96813
Attorneys for ULUPONO INITIATIVE

DATED: Philadelphia, PA, February 8, 2019



C. Baird Brown
eco(n)law LLC
230 S. Broad St, 17th Floor
Philadelphia, PA, 19102
Office: 215-586-6615
baird@eco-n-law.net