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VIA ELECTRONIC MAIL

National Association of Regulatory Utility Commissioners
1101 Vermont Avenue, NW, Suite 200
Washington, D.C. 20005

Re: Comments on the Draft NARUC Manual on Distributed Energy Resources

To Whom It May Concern:

This firm represents The Microgrid Resources Coalition (“MRC”). The MRC is pleased to submit its enclosed comments in response to the draft NARUC Manual on Distributed Energy Resources.

Please feel free to contact me directly at the telephone number above.

Very truly yours,

C. Baird Brown
Attorney for the MRC

CBB/BC

Microgrid Resources Coalition

Comments on Draft NARUC Manual on Distributed Energy Resources

1. Introduction

The Microgrid Resources Coalition ("**MRC**") is pleased to provide comments to the National Association of Regulatory Utility Commissioners ("**NARUC**") on the draft NARUC Manual on Distributed Energy Resources (the "**Manual**") prepared by the Staff Subcommittee on Rate Design (2016). The MRC is encouraged to see NARUC addressing the important issues for utility ratemaking raised by the proliferation of new distributed energy resources ("**DER**") and strongly supports the effort.

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 currently engaged in a wide variety of microgrid-related activities across the United States and its members are vitally interested in the regulations and rate-structures applicable to microgrids. [1]

[1] The MRC is actively engaged in advancing the understanding and implementation of microgrids across the country. MRC members hold significant energy assets connected to the electric grids, provide energy generation and supply services, and are exploring microgrid construction and ownership in different locations throughout the country. MRC members include: Anbaric Transmission, Concord Engineering Group, ICETEC Energy Services, Inc., NRG Energy, Inc., and Princeton University. 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.

The MRC is concerned, as a threshold matter, that the Manual too often addresses DER as a single category of technology. The policies and policy discussions set out in the Manual often center around simple DER, primarily solar, with limited output controls and no communication to the control area operator, rather than the full array of existing and potential DER types. It also frequently assumes that benefits (such as carbon reduction) or detriments (such as stranded assets resulting from load reduction) can be allocated to and addressed within a single class of customers. The MRC strongly supports unbundling the services provided by DER from sales of power to customers who deploy DER, providing specific compensation for different classes of services whether provided by DER or other resources, and encouraging utilities to explore the range of services that can be provided by sophisticated DER such as microgrids. Applying policies aimed at simple DER to the entire DER category will artificially limit the advancement of DER technology.

DER empowers customers to make choices that efficiently suit their energy needs. Customer goals include obtaining high-quality, reliable, low-cost electricity, but also obtaining heating, cooling, hot water, and steam for specialized processes. They have choices of energy sources, including gas, electricity, geothermal, solar, and biomass, and through thermal and electric storage and equipment optionality (such as steam vs. electric chillers) can optimize among those sources. Customer decisions about usage of other utilities, such as water and sewer services, are often integrated in the decisions about energy use. Those uses may soon expand to include wide use of electric or plug-in hybrid vehicles. Customers also frequently have non-monetary goals, such as decreasing their carbon footprint. Customers generally are the only ones that can effectively make integrated choices between energy sources, between modes of operation, and between monetary and non-monetary goals for their energy usage.

Because customers have incentives to invest in energy solutions to meet their own needs, they are often in a position to provide services to the grid at prices that need not reflect their full cost of capital to provide the service. All grid customers can benefit. Customers deploying DER need to face clear price signals both for their cost of power (such as time of use rates) and for the services they provide to the grid to allow them to make efficient decisions. The pricing of services to and from the grid, in turn, must give appropriate price signals so that the results are efficient for the grid. And tariffs must support utility operations while giving utilities incentives to support third-party deployment of DER.

2. Manual Definitions

The Manual defines DER as "a resource sited close to customers that can provide all or some of their immediate power needs and can also be used by the system to either reduce demand (such as energy efficiency) or increase supply to satisfy the energy or ancillary service needs of the distribution grid. The resources, if providing electricity or thermal energy, are small in scale, connected to the distribution system, and close to load. Examples of different types of DER include photovoltaic solar, wind, and combined heat and power (CHP), energy storage, demand response, electric vehicles, microgrids, and energy efficiency."[2] The MRC is concerned that the definition unnecessarily limits DER potential. The suggestion that DER be "small in scale" is unobjectionable, but the arbitrary cap of 10 MW unnecessarily limits the size of microgrids, aggregated DER, and community-based solutions. While we agree that DER is typically "close to customers" (usually behind the meter), we note that while some services to the

[2] Draft NARUC Manual on Distributed Energy Resources Compensation, 2016, p. 17. ("Manual").

grid are hyperlocal in character, most are not, and DER can be aggregated to provide grid services.[3] The MRC encourages NARUC to avoid artificial limitations.

The Manual defines microgrids as "localized grids that can disconnect from the traditional grid to operate independently and help mitigate grid disturbances."[4] While we agree with the definition to the extent that it describes a micro control area, the definition focuses entirely on the ability to island from the larger grid. The MRC defines a microgrid as "a local electric system or combined electric and thermal system that: (1) includes retail load and the ability to provide energy and energy management services needed to meet a significant proportion of the included load on a non-emergency basis; (2) is capable of operating either in parallel or in isolation from the electrical grid; and (3) when operating in parallel, can provide some combination of energy, capacity, ancillary or related services to the grid." This language captures microgrids' ability to sell services to the larger grid and the opportunity for substantial efficiencies achieved through co-management of electric and thermal loads.

The brief discussion of microgrids in the Manual references services to the grid including grid resilience, mitigating grid disturbances, integrating renewable resources and increasing efficiency.[5] While the description is accurate as far as it goes, the Manual does not seem to consider those services in later discussions, and the MRC suggests NARUC elaborate on the potential of advanced DER in discussions of system values. As a whole, the discussion and definition of microgrids ignores larger scale microgrids and community-based microgrid solutions.[6]

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[3] Id.
[4] Id. at 19.
[5] Id.
[6] MRC and IDEA members own and operate a number of large scale microgrids. For example, Princeton University operates a 15 MW cogeneration microgrid facility, Cornell University recently completed a 37 MW microgrid and Rutgers University's cogeneration facility produces roughly 13.5 MW.

3. The Spectrum of DER

All DER are not created equal. DER covers a vast range of technologies, from "dumb" and unresponsive to smart and flexible. For example, the typical rooftop solar PV installation does not communicate to the grid in real time and is unable to modulate production in response to signals from the grid or its owner. At the other end of the spectrum, microgrids are typically smart and responsive – able to communicate with the grid operator and respond with finely tuned output. They bid into day-ahead and real-time markets not only for demand response, but for regulation and other ancillary services, and the existing markets in the most advanced Regional Transmission Organizations ("**RTOs**") do not exhaust their capabilities.[7] The ancillary services that are needed by the grid today may not be the ones needed tomorrow.

A modern microgrid can communicate directly to the grid and adjust its performance in response to grid signals. Using electric and thermal storage capabilities, a microgrid can locally manage variable renewable generation, particularly on-site solar. By "smart" management of thermal loads, microgrids can effectively use buildings themselves as thermal storage to manage load shape. These and similar efficiency and energy management strategies not only save money but also significantly reduce the environmental impact of providing energy services. In addition, customers served by microgrids typically make substantial investments in energy efficiency. They adopt passive measures that reduce energy consumption, and more efficient HVAC and other systems that, when coupled with sophisticated controls, allow them to manage their load shape as well as further reduce load. These investments are made to operate in tandem with their generating and thermal generating systems. The microgrid context makes them economic.

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[7] The Princeton microgrid provides demand response and regulation to PJM and would be capable of providing spinning reserve if PJM rules allowed. MRC member ICETEC has helped numerous microgrids sell into RTO markets, including PJM, NYISO and ISO New England.

Microgrid operators frequently also invest in operational or switching capabilities to enhance resiliency or reliability, such as black start and “islanding’, especially for mission-critical load clusters such as research institutions, healthcare or manufacturing facilities where costs of interruption can be damaging economically and functionally. The ability to maintain operations during severe weather events or extreme temperature conditions are obviously beneficial to the host facility, but additionally provide regional benefits by alleviating triage costs or the urgency for emergency response for distribution utilities, enabling service restoration to occur more uniformly since mission-critical needs are already being met.[8]

Microgrids’ ability to adjust their generation and load to shape their aggregate load profiles permits them to provide more finely tuned services (“Profile Products”) than traditional demand response or ancillary services. Microgrids moderate power prices and grid congestion by efficiently shifting load to times of lower demand and pricing and by locating generation closer to loads. Profile Products can be delivered in response to real-time dispatch or market signals but also pursuant to long term contracts with utilities. Microgrid Profile Products can be unique, customizable solutions to localized planning and operational challenges. Microgrids employing multiple energy management technologies can simultaneously provide multiple services using multiple dynamic objective functions. The MRC believes that this diversity of capabilities cannot be integrated with the grid through a one-size, DER-specific tariff but only though valuation of the particular services provided by a particular DER resource.

The Manual’s discussion of rate classes is focused on distinctions between DER as a class and other customers[9] and does not distinguish between levels of DER technology. Rather, the discussion assumes that DER adoption is concentrated in non-communicative and

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[8] For example, Princeton University’s microgrid allowed the University to provide hot meals, hot showers and cell phone charging to emergency responders during Hurricane Sandy.
[9] *See, e.g.,* Manual, p. 29.

unresponsive technologies and that advanced, smart DER is yet to come.[10] In practice, microgrids, smart communication, and advanced resource controls are operating effectively today and consequently are seeing rapid uptake. Rate-making policies should account now for the growth of smart, responsive DERs and their associated grid services rather than leaving the discussion for the future, or the future may never arrive. A single rate class will never capture the diversity of DER and will improperly discriminate against microgrids.

4. Unbundling and Valuation

The MRC agrees with the suggestion in the Manual that non-discriminating tariffs for DER will require unbundling of DER provided services from each other and from power purchases by customers who deploy DER.[11] An effective tariff should also separate non-grid services including environmental values (such as low carbon emissions attributed to renewables) and social benefit charges. These are important values, which the MRC supports, but DERs are only one mechanism for implementing these social policies, and should not be treated differently than other mechanisms for achieving the same values. Accordingly, the MRC strongly supports the Manual's discussion of the value of services approach, including the recommendation for functional unbundling.[12]

By contrast, the valuation of resources approach discussed in the Manual, though it begins with a useful discussion of valuation, lumps together benefits to the customer, to the grid, and to society.[13] It tends to put each resource in a unique class and makes it difficult to allow competition among different classes of resources.

[10] Id. at 15.
[11] Id. at 47.
[12] Id. at 46-47.
[13] Id at 45.

Finally, the functional unbundling of services should distinguish distribution-level services from regional transmission organization ("**RTO**") services. The recent decision in FERC v. EPSA clarified that FERC holds jurisdiction over demand response transactions as part of the wholesale market[14] and generally suggests that RTOs can acquire services from DER through aggregators or directly. Rate designs that lump grid services with power purchases can only reduce competition in the RTO markets to the detriment of all customers.

5. Utility-Private Partnerships

The Manual deals only briefly with issues of ownership and control of DERs and generally treats third party ownership as problematic, stating that increased adoption of DER "can be driven by third party business models which are responding to price signals that compensate strictly on the basis of total energy production and not grid benefits (or costs)."[15] It continues by noting, "The lack of visibility into the current state of any DER and the lack of ability to control the DER when it is exporting to the grid, while two very distinct issues, give rise to many of the physical problems with incorporating DER into the grid." [16] The MRC suggests that efforts to reform tariff design should not confuse third party ownership with problems caused by poor rate design in the first place. The quoted passages are primarily aimed at exports that are non-communicative and unresponsive. As a service, such exports may have a low or negative value for the system, and the MRC supports for paying for all services at fair, competitive values. The problem is not third party ownership or level of adoption but incentive rates for services that are not tied to system value. Where products such as ancillary services are well designed, and especially where they are delivered in competitive markets, third party

[14] *Federal Energy Regulatory Commission v. Electric Power Supply Association* (*EPSA*), 136 S. Ct. 760 (2016).
[15] Manual at 27
[16] Id.

ownership as such does not pose risks, and increased levels of penetration generally reduce costs for all consumers. Smart, responsive DER such as microgrids should not be tarred with this brush.[17]

Third party ownership structures should be integrated with long-term utility planning to identify locations for DER, potentially paired with processes allowing for technology-neutral utility RFPs seeking solutions to operational and planning needs. Private respondents to RFPs often have more information about local, integrated electric and thermal technical solutions than utilities. In addition, because DER providers may themselves be major customers or have long-standing relationships with major customers, they may well have more information about the economics of solutions that depend on optimizing one or more customer systems to respond to utility planning and operational needs while also meeting customer needs.

In addition to RFPs, the MRC also suggests consideration of a process for unsolicited proposals from DER providers to meet needs identified in a utility 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 applicable Public Utility Commission or Public Service Commission would either directly approve, or give policy guidance on when 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.

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[17] The MRC recognizes that some of the tariffs in question have been mandated by state legislatures. Never-the-less, attempting regulatory workarounds that capture too large a class of DER will likely do more harm than good.

Whether the utility initiates an RFP or responds to an unsolicited proposal, the result will be negotiated contractual arrangements that form a "partnership" between the utility and the DER provider. This "utility/private partnership" is analogous to public/private partnerships that are often used to provide crucial infrastructure for municipal services and transportation. These contractual arrangements spell out not only the infrastructure to be constructed but also the terms of operation including the services to be provided by a microgrid and the compensation for those services – essentially a negotiated tariff. It will be important not to force such arrangements into a rigid set of service definitions. As discussed above, microgrids can provide Profile Products that are at least as varied as can be provided by a generator, including rapid response, steady state operation, timed ramping, and providing regulation around any agreed load and/or generation profile. These "Distribution Support Solutions" can be designed to meet the particular needs of the distribution system in emergencies or in daily operation.

As an example, a utility could accept proposals from three microgrids to provide generation/load reduction to support a substation during critical periods as an alternative to distribution system reinforcement. The contract could call for response in a local crisis (not just peak system demand) and require that maintenance schedules between the three resources be coordinated. Such contracts can also specify specific liquidated damages for non-performance, which can provide a much finer tuned response than permanent adjustment of demand charges. More broadly, utility/private partnership contracts can allocate the risks and benefits of long term investment appropriately among the parties. While the contract may provide specific payments for services that are guaranteed for the financing term of the project, the investment will also be supported by value provided to microgrid customers, and ratepayers bear less risk of stranded assets. Utility/private partnership projects would attract more risk-taking capital from third parties and also more patient capital from certain utility customers than utilities themselves can attract. Under this construct, payments by the utility for microgrid Distribution Support Solutions would be fully recoverable from ratepayers.[18]

The MRC suggests utilities must be made financially indifferent between physical upgrades to the distribution system and long term contracts that avoid or reduce the cost of system upgrades. One way to accomplish this is to treat these contracts as capital assets on a similar basis to the treatment of physical upgrades. The underlying physical asset may be producing value for particular customers as well (which is why the utility can get attractively priced services from the DER provider), but there is no need to make any artificial allocation, as the utility values the regulatory asset based on its cost to acquire the services (the contract payments) not the underlying asset value. The utility should be able to earn a return on an investment in such a contract. A well-structured tariff should make the utility indifferent as to whether the solution is a DER contract or a "wires" solution, without the need for the Commission to attempt to balance incentive ratemaking payments against a direct return. Payments under such contracts should not be subject to reopening in subsequent ratemaking proceedings, or they will fail to serve as a basis for financing DER.

6. Other Rate Design Issues

a. Net Energy Metering

Much of rate design discussion in the Manual focuses on net energy metering. The MRC strongly supports the availability of time of use ("**TOU**") rates for all customers and believes it would be appropriate for NARUC to consider TOU as a requirement for DER interconnections,

[18] Regarding the rate design aspect of such partnerships, the MRC supports returns on utility-private partnership contracts. The Manual raises other possibilities for flexible revenue bases which are worth exploring, including increased return on operation and maintenance. Manual at 23.

at least above a low export threshold. This would tend to reduce differences in the relationship between LMP and the tariff rate and align customer behavior with the needs of the system, so that customers reduce their usage at times when the system (especially distribution) is stressed and in need of relief. The MRC suggests that time-insensitive NEM is appropriate for very small residential installations, but it is critical that more accurate values be established for the services provided to the grid by larger and more sophisticated installations. [19]

b. Resource Quotas

The MRC strongly discourages attempting to solve grid problems by limiting customer rights. For example, the Manual states that "Regulators will need to create rules or tariffs regarding appropriate sizes of community solar gardens that are allowed to interconnect…"[20] Similarly, the Manual discusses utility efforts to discourage third party leasing of rooftop solar.[21] Actively discouraging or limiting the size of interconnected or aggregated DER is the opposite of empowering customers and will do little to resolve underlying issues. Rather, the growth of interconnected DER should trigger forward planning for grid improvements and focused DER service payments to support the grid. Already, too many non-rate regulatory barriers exist for microgrids and other advanced DER, and rate design should strive to avoid further burdens.[22]

c. Aggregation

Many of the benefits of common resource control found in microgrids can also be achieved through local or virtual aggregation. The California Independent System Operator

[19] Alternatively, services that are currently structured as net metered might be treated as incurring the avoided cost of storage on a collective basis. Exports not needed by the grid are not services to the grid, but a service provided by the grid – i.e. avoided cost of storage.
[20] Manual at 18.
[21] Id. at 27.
[22] Non-rate regulatory barriers imposed by states on microgrids include, for example, restrictions on non-utility power sales, restrictions on service to multiple customers, limits on retail distribution of thermal energy, and limites on connecting microgrids across property lines or roadways.

("**CAISO**") recently filed tariff revisions with the Federal Energy Regulatory Commission ("**FERC**") to facilitate participation of aggregated DER in the CAISO markets.[23] The MRC intervened in support of tariff provisions that would permit distributed energy resource aggregations to provide a net response at the pricing node level as opposed to an individual distributed energy resource location in order to capture the value aggregation provides at the transmission-distribution interface. This illustrates that resource control and communication with the control area operator can be achieved on an aggregated basis not only within a microgrid but also externally, and tariff structures need to account for the actual effect on the grid of the controlled group of resources rather than one resource at a time. Aggregators of multiple DERs that employ control systems and/or storage capabilities, will also be able to 'smooth' the interactions of their customer base with the grid, and provide additional grid support when needed. For low income consumers, DER may only be available through community programs, virtual net metering or other forms of aggregation. To increase access, rate design needs to look forward to community microgrids and multifamily development microgrids.

d. Cost Allocation

The Manual specifies that costs of DER not recouped by per kWh due to lower usage may be considered stranded costs and that a rate design should strive to recover such losses. [24] The MRC disagrees with this statement. There are many factors that may result in lowered net kWh rate base, such as the closure of industrial facilities, energy efficiency measures, or shifting patterns of customer use, as the Manual acknowledges. No customers "signed up" to bear

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[23] California Independent System Operator Corporation, *Distributed Energy Resource Provider Initiative—Docket No. ER16-1085-000*, March 4, 2016.
[24] Manual at 31-32.

stranded costs and singling out a particular class of customers to bear stranded costs would be an inappropriate subsidy of other customers.

The Manual also raises the specter that increased DER will accelerate the need for updated distribution systems to avoid overloading feeders with customer generated electricity reversing usual flows.[25] The accompanying policy discussion suggests recovering those costs from customers through rate adjustments. However, when feeder upgrades are required due to increases in load, such costs are spread across all customers. Assuming the excess delivered energy is correctly priced, utilities should consider protecting the system, through increased storage,[26] either through utility investments or incentivized as part of long-term planning and utility/private partnerships. The MRC shares the Manual's concern that utility efforts to increase fixed charges should be viewed with skepticism[27] and believes that assuring revenues by burdening a particular class deserves the same scrutiny.

7. Conclusion

The MRC thanks NARUC for considering the above comments in response to the Manual. We hope this brief discussion of issues is helpful to NARUC and its staff and would be happy to discuss in further detail if helpful. Overall, the MRC wishes to stress that advanced DER such as microgrids encounter strong barriers to entry under state law and very limited compensation opportunities for providing services to the grid. We encourage an approach in which all services (including all net exports to the grid) are valued and compensated separately from customer purchases of energy. This is the only approach that is consistent with non-discriminatory opportunities to provide grid services and the empowerment of customers.

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[25] Id. at 31.
[26] This can be through thermal storage where a customer uses electric chillers to move peak cooling consumption.
[27] Manual at 31