September 2, 2016

The Honorable Travis Kavulla
President, National Association of Regulated Utility Commissioners
1101 Vermont Avenue, NW
Suite 200
Washington, DC 20005

RE: Comments on NARUC Manual on Distributed Energy Resources Compensation

Dear President Kavulla:

Stem respectfully submits these comments to the draft staff manual on Distributed Energy Resources Compensation. While we are glad for the opportunity to provide input, we also believe the timing has been insufficient and we urge NARUC leadership to consider extending the process in a thoughtful way that will lead to more thorough and productive results.

I. Overview

Stem applauds the recognition by NARUC staff that, while Distributed Energy Resource (DER) adoption is nascent in many states, it is nonetheless worthwhile to develop a manual that provides guidance on policy approaches. States that are in the forefront of the movement towards DER need additional assistance transitioning to the next generation of DER policies as the current policies are reaching their limits. States that are following would benefit from knowing the risks and imminence of the pitfalls others experienced and whether there are effective ways around those challenges. Based on our extensive experience in deploying energy storage systems, our comments are meant to be helpful to States at any stage of this evolution.

II. Stem Background and Experience

Stem is the nation's leading company in the installation and operation of "behind the meter" (BTM) distributed energy storage. We have the most experience dispatching energy storage for the benefit of an energy consumer based on the tariffs and rates available to them. Beyond consumer benefit, we have also pioneered using BTM storage to provide benefits to the grid and to receive compensation for that additional value. For example, Stem was the first company to deliver on a contract with a distribution utility for grid services from an aggregated fleet of BTM storage (HECO program) and is now executing the largest contract for BTM storage in the world (85 megawatts with Southern California Edison). Notably, Stem was the first storage company to bid aggregated BTM storage into a wholesale market (day ahead and real time in the CAISO). Stem contends that cost-effective, intelligent BTM energy storage fundamentally alters the DER Compensation conversation and provides a path forward for regulators to more cleanly design rates according to core principles, separate from technology specific societal goals.

III. Overarching Discussion of Manual

Stem believes that rate design should be technology-neutral and adhere to core principles related to consumption, independent of DERs. The draft manual states: "the regulator should first decide whether

he or she is interested in using rate design options to promote DER"[1] For the majority of regulators, Stem believes that the answer to that questions will likely be "no", unless DER cannot be promoted with non-rate-related policy options. As such, the manual would do well to offer alternatives to DER targeted rate design throughout the document. Compensation for the value of DERs to the end customer is captured in how the customer saves money under their current consumption/demand-based rate design**.** Compensation for the grid value of DERs can be captured in direct utility programs, utility contracts or wholesale market participation**.** Finally, we suggest that compensation for the societal value of DERs be captured in separate mechanisms, not tied to markets or rates. These are typically direct incentives such as rebates or tax credits.

IV. Fundamental Issues in Current Draft

First, we think the treatment of what constitutes a DER should include more than renewable energy generation**.** The manual discusses a broader definition but many of the statements and most of the discussion centers around distributed generation. Case in point, the current definition in the manual[2]--"a DER is 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"--misses the potential for distributed energy storage to **increase demand** (in response to over-generation conditions) or **decrease supply** (reducing the amount of distributed generation exported to the grid).

Another key point that was missed in the manual is the mischaracterization of dispatchability. The manual states: " customer sited DER, especially renewable generation, is generally 'non-dispatchable' and its effects are often localized at the feeder level."[3] Both demand response and storage are dispatchable; in fact, dispatchability is core to the value that these DERs can provide to the grid. Dispatchable distributed storage is already being used to provide substation and bulk system services with as much or more value that the feeder level benefits. Stem's aforementioned project with HECO provides aggregated benefits across the distribution grid on Oahu, while this summer, Stem systems are being dispatched for system Resource Adequacy within California's Demand Response Auction Mechanism (DRAM).

DERs can provide far more benefits than simply energy. The Rocky Mountain Institute identified thirteen distinct value streams for storage.[4] Regulators and grid operators should take all of the potential value streams/benefits into account when considering rate design and other mechanisms to incentivize adoption of DERs.

Figure 1. Value Streams of Energy Storage, Rocky Mountain Institute

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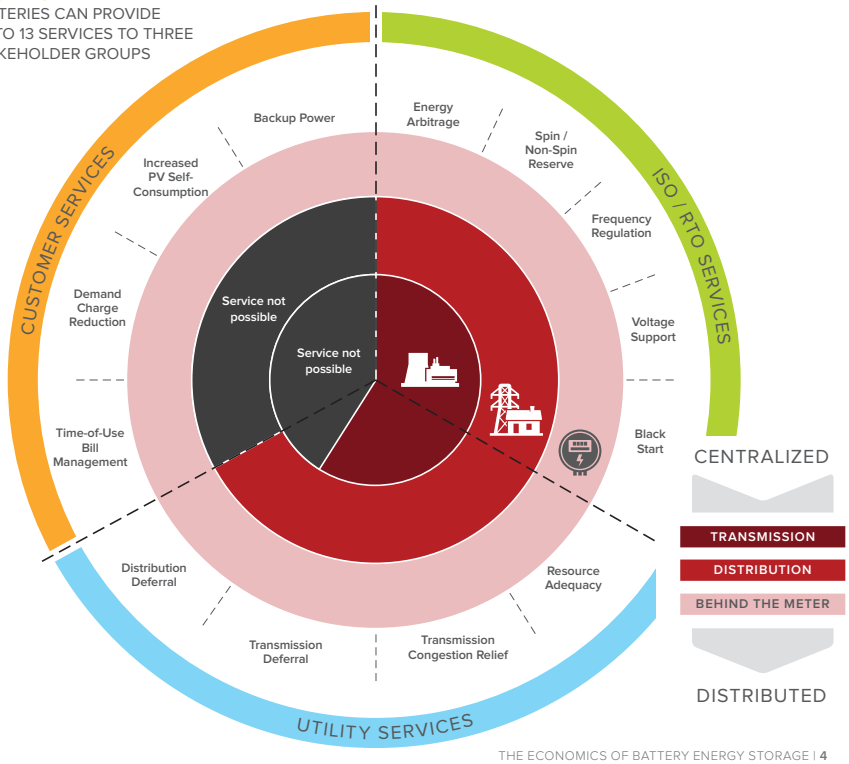
[1] Draft NARUC Manual on Distributed Energy Resources Compensation, prepared by Staff Subcommittee on Rate Design, 2016, page 25.
[2] Manual, page 17.
[3] Manual, page 24.
[4] http://www.rmi.org/electricity_battery_value

FIGURE ES2
BATTERIES CAN PROVIDE
UP TO 13 SERVICES TO THREE
STAKEHOLDER GROUPS



Stem believes that compensation for DERs should be proactive rather than reactive. The manual states "after empirically establishing at what adoption level they will affect the grid, regulators should explore and implement rates and compensation methodologies that will lead to greater benefits for the public, customers, and utilities alike."[5] This statement reflects the fundamentally "reactive" approach to DERs that typically dominates the thinking of policymakers and grid planners. Policy design that simply reacts to what is coming into the market may work for follower markets that are just starting to see DER adoption, but this approach does not take into account more advanced markets that should be switching to a proactive approach. Stem recommends that these more progressive states be encouraged to plan in advance for how much and where they need and want DERs, and then design compensation mechanisms that will achieve those goals.

The Brooklyn Queens Demand Management (BQDM) program in New York provides a useful example of this concept. After determining a need for DERs in a particular part of the distribution grid, the policymakers did not design rates to compensate those DERs and expect consumers to respond. Instead, a compensation mechanism was designed to capture the grid value that the DERs could provide. This further illustrates the distinction between grid value and consumption value, because energy storage systems that are awarded a BQDM contract can also provide bill savings to the host customer with the same DER asset.

[5] Manual, page 15.

V. Expanding on "Design for Market Stage" Concept

The draft manual describes a paper by Lawrence Berkeley National Laboratory on constructing regulatory mechanisms based on "Stages" of DER development[6]. While Stem would define the Stages somewhat differently, we also recognize that it is important to guide regulators on what policy ideas are appropriate for different Stages. Specifically, we believe the manual should acknowledge that rate design, as DER compensation, might not be appropriate for certain Stages. We also recommend that NARUC undertake a broader effort to guide regulators on appropriate DER policies at different Stages and better define those Stages. Many non-rate-related policy mechanisms have been successful in promoting DERs, and Stem would gladly serve as a resource with experience and research to contribute to this effort.

VI. Key Principles of DER Rate Design

Stem recommends that several concepts and principles be incorporated into the manual, at a minimum as alternative methodologies for consideration by regulators. We provide several such ideas here as starting points for conversations:

Regulators should value attributes rather than technologies.

Setting attribute-based goals allows people to solve problems in unique and original ways. Regulators have in some cases effectively reduced emissions in the power sector by valuing clean energy and not necessarily the technology that produced it. There is modest societal value in promoting generation from clean resources *per se*, while much of the value is in the cleanliness itself: the reduction in CO2, SO2, NOX, particulate matter, and air toxics. Similarly, if regulators wish to target and control growing T&D costs, they could consider offering general incentives to technologies that can shave peak demand rather than pre-defined specific technologies. In each case the principle is the same: allow any resource that can meet the need do so.

Rate design should follow principles independent of environmental or technical goals; societal benefits of DER should be separated from design of rates and compensation for grid benefits.

Stem fundamentally believes in the operation of markets to monetize value provided by DERs and those markets do better when the compensation mechanisms are not mixed. Payment for energy consumption is one market, operated typically as rate design within a regulated monopoly. All types of grid benefits that a DER can provide should be in a distinct market that doesn't distort the retail consumption transactions. Societal benefits of DER can be more cleanly captured in their own market with their own sellers and buyers.

*Grid benefits should be compensated at a verifiable value, no matter the resource—and account for full **benefits**, not just the **cost** of DER.*

Multi-use applications (MUA) allow storage to provide multiple services in parallel, that will improve the economics of the asset, increase DER adoption, and offer more grid and consumer benefits. Such "value stacking" is limited today to a relatively small number of situations. Regulators should seek to enable all physically and economically possible value streams to be fully compensated.

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[6] https://emp.lbl.gov/sites/all/files/lbnl-1003797_0.pdf

Intelligent energy storage can provide the predictability and dependability that grid operators need to fully compensate DERs. Grid benefits cited by advocates are often after-the-fact, e.g. a utility realized it could defer a transmission investment only after enough solar PV had been adopted. Instead of encouraging unpredictable adoption through rates, regulators should create market mechanisms that allow utilities to contract with DERs to meet grid needs. For example, adding storage can enhance distributed generation by turning installations into grid assets that can be contracted to provide grid benefits. Instead of relying on individual customer adoption, grid benefits can be procured from a third party to deliver on an aggregation of customer-sited DERs.

If bill savings and grid compensation are insufficient to spur adoption of DERs (to meet state goals, for example), targeted incentives can be developed.

While regulators can create value-based incentives to spur grid modernization, sometimes, stronger cost buy-down is required to meet local or state goals. In these cases, policymakers can create incentives that are separate from rates. Offering funding for research and development, soft cost reductions, and pilot projects drive down the technology cost curve but do not distort prices of the overall market. This approach minimizes price-suppression effects and the prospect of cross-subsides.

VII. Technology Enabling Rate Resign

The NARUC Manual lists smart grid technologies that can help provide more data for rate design, but does not mention how these technologies can also empower consumers to be "smarter" ratepayers, able to accommodate and work with more complex, dynamic rates. It is not just the data that DERs can provide, but also the increased ability that DER adopters have to react to dynamic or complex rates. This gives regulators a much bigger toolbox/set of options for designing rates **in general**, not just DER compensation tariffs.

VIII. Summary and Conclusion

In summary, Stem applauds NARUC for this worthwhile effort, but also feels that key components are missing from the draft. Stem has proposed here a thought process that the manual could incorporate in its guidance to regulators: value attributes rather than technologies; design rates to follow principles independent of environmental, societal, or technical goals; account for and compensate the full range of grid benefits at verifiable value; and, if bill savings and grid compensation are insufficient to spur adoption of DERs, develop targeted incentives. Stem appreciates the opportunity to submit these comments and looks forward to working with and serving as an experienced energy storage expert to Commissioners and staff as NARUC continues important discussions on the value of distributed energy resources.

Respectfully submitted,

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