



September 2, 2016

Commissioner Travis Kavulla, President
National Association of Regulatory Utility Commissioners
1101 Vermont Ave NW # 200, Washington, DC 20005

RE: Comments on NARUC Distributed Energy Resources Compensation Manual

Dear President Kavulla:

Rocky Mountain Institute (RMI) offers the attached comments in response to the draft of the NARUC Distributed Energy Resources Compensation Manual, issued July 21, 2016.

We commend NARUC and the Staff Subcommittee for undertaking this important work. The U.S. electricity system is undergoing a historic transition, evolving from centralized fossil fuel powered generators of the last century to a more distributed, clean energy network. Informed, well-considered regulation is critical to managing the grid's evolution to achieve the maximum benefit to customers and society. Few issues are more important right now than establishing the fair and accurate compensation of distributed energy resources.

The draft manual includes helpful discussion of many key issues impacting DER valuation, and provides valuable guidance on some leading approaches under consideration. We are concerned, however, that the manual inadequately describes many topics, and provides confusing and uncertain takeaways on important issues.

Now more than ever, utility commissioners need well-structured input with clear framing of the decisions before them. We hope that the attached comments support revisions to the compensation manual that deliver on that need. In an attempt to provide constructive feedback, our comments are organized around the following three suggestions:

1. Clarify the available options and design choices for DER compensation
2. Promote a more complete evaluation of DERs' costs and benefits
3. Revise discussions to identify key takeaways and be clear where there remains uncertainty

We appreciate the opportunity to provide input on this important work. We would gladly be available to discuss these or other points further, as useful to you or the committee.

Sincerely,

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Comments of Rocky Mountain Institute on NARUC's Draft Manual on Distributed Energy Resources Compensation

RMI offers the following suggestions and input to improve the NARUC manual to make it a valuable reference for utility commissioners and regulatory staffs throughout the U.S.

RMI has been a thought leader and active participant in the clean energy transition for more than thirty years. Our perspectives on DER compensation are informed by ongoing collaboration with stakeholders from across the electricity sector, including regulators, utility managers, DER developers, and low-income advocates. Those activities include RMI's convening the Electricity Innovation Lab (e²Lab) since 2012, and our role as advisor to the New York Public Service Commission in the Reforming the Energy Vision and the Value of DER proceedings. In addition, RMI publications on rate design, evolving utility business models, and integration of DERs are widely regarded as insightful and balanced treatments of leading questions facing the electricity sector.

Our review of the manual and preparation of these comments was jointly supported by the following RMI staff.

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Our suggestions are organized around three primary themes:

1. Clarify the available options and design choices for DER compensation
2. Promote a more complete evaluation of DERs' costs and benefits
3. Revise discussions to identify key takeaways and be clear where there remains uncertainty

1. Clarify the available options and design choices for DER compensation

While the manual covers a broad set of issues ranging from vertically-integrated versus restructured markets to decoupling and costs of metering, it is most important that it deliver on its core purpose to provide a clear and constructive assessment of available options for DER compensation. To strengthen that focus, we offer three suggestions, each of which is discussed further below:

- a) Broaden the menu of options for addressing DER value and cost recovery
- b) Distinguish rate design options from compensation mechanisms
- c) Distinguish between technologies and their available services

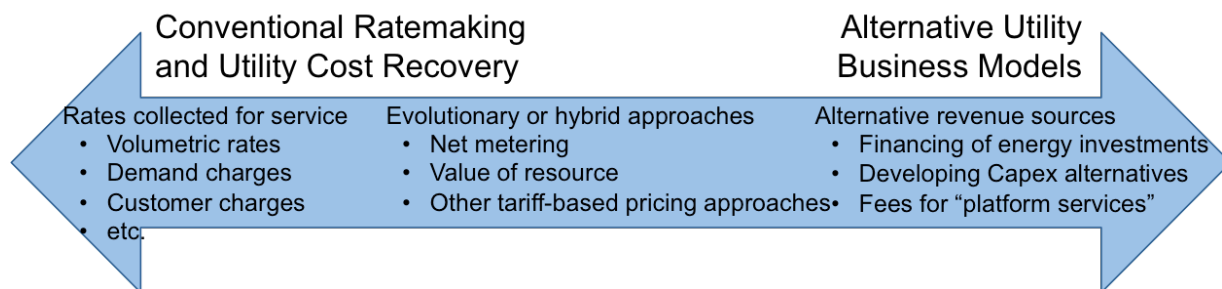
a) Broaden the menu of options for addressing DER value and cost recovery

The draft manual successfully identifies the most common and immediately available tools for valuing DERs. While we agree that the tools described in the manual (i.e., modifications to rate design, net metering, value of resource assessments) are the most immediately relevant, we suggest framing these in the context of a larger suite of available approaches.

For example, the section *Valuation Methodology* presents options including value of resource, value of service, and transactive energy; however, it omits other possible approaches beyond the scope of conventional ratemaking and utility cost recovery. We suggest that the section should also include alternative approaches that would evaluate the DER value proposition in new ways, such as platform services being considered in New York and Illinois,¹ or incentives for DERs as infrastructure alternatives (sometimes referred to as capex alternatives or non-wires alternatives).²

By omitting emerging utility business models, valuation methods, and cost-recovery mechanisms, the manual presupposes a limited option-set for regulators. It therefore risks perpetuating the self-limiting perception that valuation of DERs must begin from the perspective of the potential threat these resources present to utility cost recovery, which must be addressed through incremental revisions within the existing ratemaking paradigm. This is not necessarily the case, and a constructive discussion should start by placing options within a larger context.

Below we offer a representation of the range of cost-recovery and business model options that may be available to utilities and regulators.



¹ See, for example, Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision, *Order Adopting a Ratemaking and Utility Revenue Model Policy Framework*, May 19, 2016. Also *Chicago's REV: How ComEd is reinventing itself as a smart energy platform*; Gavin Bade in UtilityDIVE, March 31, 2016.

² This approach is being deployed in Consolidated Edison's Brooklyn Queens Demand Management (BQDM) program (Case 14-E-0302, *Order Establishing Brooklyn/Queens Demand Management Program*, December 12, 2014); the concepts are also described in a proposal by Commissioner Michel Florio in California (Case R.14-10-003, *Assigned Commissioner's Ruling Introducing a Draft Regulatory Incentives Proposal for Discussion and Comment*, April 4, 2016).

While it may not be appropriate to give significant attention to those options on the far right of this diagram, it is helpful to at least recognize them in order to describe the place that the manual occupies within this larger set of options. Recognizing these options allows the manual to identify the segments of the issue it sets out to tackle, as well as to establish the limits of its scope.

RMI's 2014 report for the U.S. Department of Energy, *Bridges to New Solar Business Models*³, provides additional helpful framing in this regard, in the context of distributed solar PV.

b) Distinguish rate design options from compensation mechanisms

While rate design and DER compensation are linked—most notably through net metering—it is useful to distinguish rate design (prices paid for electricity service) from DER compensation (payments or credits for services to the grid). The draft manual conflates these approaches, potentially introducing confusion by presenting demand charges and other rate design options in the same discussion as net metering (in a manner that could be misinterpreted as placing demand charges or other rate structures as a direct alternative to net metering).

We recommend moving the discussions of demand charges, fixed charges, and minimum bills out of the *Compensation Methodologies* section of the manual. Strictly speaking, these are options for conventional rate design, and can be applied to all customers, regardless of whether a customer has DERs.

This also points to a distinction that we find helpful to make between valuation *methods* and *mechanisms*. By this lens, a methodology is the process and analysis used to determine rates or other value assessments (e.g., rate case analyses, value-of-solar studies, etc.), whereas a mechanism is the tariff structure by which the value is imposed (e.g., net metering with bill credits, buy-all/sell-all, auctions or solicitations).

c) Distinguish between technologies and their available services

To properly attribute value to DERs or any resource, it is helpful to separate technologies from the services they provide.⁴ This encourages more technology-agnostic valuations, as well as creates greater opportunities for new technologies and products to develop in the marketplace. To support this distinction, we suggest two changes to the treatment of technology and DER services in the manual, which together will support a clearer framing of the relevant issues and options.

³ Available for download at: http://www.rmi.org/rmi_sunshot_doe_bridge_solar_business_models

⁴ As an easily relatable example, solar PV is a technology, whereas electricity generation is a service it provides. Likewise, energy storage is a technology (or a class of technologies), while load shifting and load shaping are each services that storage can provide.

First, we suggest that the current discussions of technology in the draft manual be combined into a single section, *DER Technologies and Services*, to allow a more complete discussion of DERs and related technologies.⁵ That section might open with a brief review of desired grid services, followed by examples of prominent technology options that can provide each of those services.

Second, DER technologies (those listed in the current *What is DER?* section) can be differentiated from DER-enabling technologies (those listed in *Technology, Services, and Evolving Marketplace*). The latter set might be further distinguished between customer-sited technologies and grid technologies. Adopting these distinctions would support a constructive discussion of the particular ratemaking and valuation considerations that need to be made for each (for example, how to evaluate and possibly rate-base system investments such as AMI, as compared to treatment of customer-sited enabling technologies such as smart thermostats or in-home-displays).

Please see Appendix A for further elaboration of how we have thought about structuring the description of DER technologies.

2. Promote a more complete evaluation of DERs' costs and benefits

In any assessment of resource value, it is important to consider both the benefits and costs of resources to the grid, as well as to relevant stakeholders including customers, the utility, and society. We are therefore pleased to see attention given to the benefits provided by DERs in the draft manual, however we note that the discussion seems underdeveloped and, in places, suggests the authors are unconvinced that DER benefits are credible. The section stands in contrast to the *Costs* section, which includes section sub-headings to identify specific cost drivers, and generally is written in a tone that suggests more credibility to DER costs.

To promote a more rigorous evaluation of DER benefits, we suggest clearly identifying the categories of benefit that could be provided by distributed resources. An enumerated list or table would make the manual user-friendly to regulators and their staffs, as well as reduce the risk of misinterpretation of complicated issues that are currently glossed over or presented in nuanced terms.

As an example, we suggest the following broad categories of DER benefits, under which discussion of specific benefits can be organized:

1. **Benefits to the bulk system**, or G&T system (for example reduced energy costs, reduced capacity costs, transmission avoidance, reduced losses, etc.)

⁵ The draft manual includes two different sections that enumerate relevant DER technologies, separated by 40 pages of text on other topics. This creates confusion for what, the authors consider to be DER, what are non-DER technologies, and how the two relate to each other.

2. **Benefits to the distribution system** (distribution infrastructure avoidance, reduced losses, etc.)
3. **Reliability impacts** (avoided outage costs, avoided restoration costs)
4. **Positive externalities** (GHG reduction, criteria pollutant reductions, job creation, etc.)

The New York Public Service Commission's recent order establishing a benefit cost analysis framework⁶ provides a helpful structure and discussion of available valuation methodologies for many categories of benefits. Numerous other regulatory dockets and studies similarly provide helpful frameworks and discussions of benefits from DERs.⁷ We believe that giving explicit attention to those sources, and adopting some of their key findings, analytic approaches, and relevant charts or figures, would improve the manual.

Although these comments have focused on the benefits side, the discussion of DER costs could also be improved by adopting a similar set of cost categories, as well as more complete treatment of available methodologies for calculating costs.⁸

3. Revise discussions to identify key takeaways and be clear where there remains uncertainty

The manual provides an important opportunity to clarify key issues, identify areas of debate, and provide specific recommendations for regulators. We are concerned, however, that the draft manual presents a confusing and inconsistent treatment of issues, and leaves the reader with uncertain takeaways on the available options.

We note two aspects of the draft manual that contribute to potential confusion. First, in many places, the manual is written in a tone or voice that blurs the line between recommendations for regulators and areas of debate or uncertainty. Second, the manual would benefit from a more consistent structure to provide an organized treatment of featured issues. We elaborate on each of these in the following discussion.

a) Separate discussions of context or industry debate from the Staff Committee's recommendations

⁶ *Order Establishing the Benefit Cost Analysis Framework*, January 21, 2016, in Case 14-M-0101 (Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision).

⁷ See, for example, *Benefit-Cost Analysis for Distributed Energy Resources*, Synapse Energy Economics, prepared for the Advanced Energy Economy Institute, September 2014. Also *A Review of Solar PV Benefit and Cost Studies*, Rocky Mountain Institute and the Electricity Innovation Lab, September 2013.

⁸ Many DER benefits can, of course, also be experienced as potential costs, resulting in a similar list of categories for inclusion on the cost side. Alternatively, each benefit or cost, and associated methodologies, can be expressed as net benefits to simplify the structure and associated calculations.

The draft manual is not always transparent on where it is either making a recommendation for regulators, presenting sides of ongoing industry debate, or, in some cases, tacitly promoting a position without substantiation. Similarly, in a number of instances, the manual makes broad statements in a manner that suggests positions are universally agreed or are statements of fact, where they may actually be important issues that deserve careful consideration, or are issues where there are legitimate differences of opinion and room for debate. Frequently, these statements lack citation or credible balancing of competing evidence.

The following examples illustrate cases where this is seen. In some or all instances, we recognize that we may have misinterpreted the intended meaning of the passage. However our own confusion suggests the importance of addressing these concerns in the final manual.⁹

Example #1

Proponents of NEM argue that the revenue reduction of utilities from NEM is justified and appropriate.... Customer generation, it is argued, reduces utility generation even if the generation occurs at times other than when the customers consume electric energy... Proponents argue such savings to the system (and therefore to all system users), though difficult to calculate, justify granting customers the full benefit of reduced bills, including not only reduced energy costs but also any margin built into the kWh charge. (p.54)

This is an instance of the draft manual offering point/counter-point observations of an ongoing debate in the industry. However, the tone of the discussion implies that the potential upsides of NEM are provided only for the sake of recognizing them, not because they may be valid. We suggest that observational discussions like this be presented in as objective a tone as possible. Following which, as appropriate, the Committee can make specific recommendations or provide analysis on the legitimacy of arguments made on either side of the debate. Under the current structure, however, the Committee's preferences and the opinions of each side of the argument are conflated.

Example #2

Regardless of what direction regulators of any particular jurisdiction would like to head in the future, the acknowledgement and study of these benefits will most likely be necessary. As such, they are just another "issue" brought to the forefront by DERs. (p.26)

This passage, in particular the second sentence referring to DER benefits as "just another 'issue'" to be solved, illustrates a dismissive and at times scornful tone that appears in parts of the draft manual. This is not appropriate for a document intended to offer an authoritative, objective, and well-balanced perspective for regulators who are facing tough decisions.

Example #3

⁹ These examples are not exhaustive, but are provided in order to help identify instances where we found the writing unclear or potentially misleading. We are available to discuss further as helpful to the committee.

Customer-side PV generation peaks in the afternoon, and the grid operator accommodates the customer surplus flowing onto the grid... This action has a cost and, in the future, may strain the abilities of conventional plants. Then, later in the day, as customer generation falls off, customer loads begin to rise, and net customer loads, accounting for the reduction in customer-side generation, rise very rapidly. (p.44)

This is an example of the draft manual taking a specific, empirical trend that is a concern in some jurisdictions and generalizing it as a principle that applies in all cases. The passage presents observed features of some distributed PV and grid operations in a manner suggesting they are universal and immediate concerns, whereas the identified issues actually vary significantly by region and by underlying drivers of load (e.g., day-time AC versus evening consumption). The passage suggests that the issues are imminent threats of significant magnitude, when in fact, in most cases, the concern is relatively minor to non-existent at present. This risks perpetuating unconstructive fear-based debates rather than constructive, informed dialogues. We suggest that the manual reference specific locations where this is a challenge, and acknowledge that the challenge varies based on regional and other factors.

Example #4

Higher fixed charges accomplish the goal of revenue stability for the utility, and, depending on the degree to which one agrees that utility costs are fixed, match costs to causation. (p.54)

Statements such as this would be better presented as “perspectives” or arguments offered in favor of a given approach, rather than a statement of fact without empirical support. The subsequent discussion in the draft manual presents a more nuanced and critical assessment of fixed charges, however this passage misleads the reader at the outset.

Example #5

Though a Wikipedia article on net energy metering referred to a standby charge that was abandoned before 2005, and another on Solar Power in Virginia indicated a requirement for solar arrays of capacity above 10kW, there does not seem to be either standby charges or backup charges as a general matter in the distributed energy resources area. However, it may be possible that some utilities are currently considering whether to pursue this option. [Footnote 87]

This passage indicates a highly speculative approach and reliance on hypothetical proposals to develop the content of the manual. As the manual acknowledges, standby charges for small-scale DERs are not necessarily being considered in a meaningful way, yet the footnote and accompanying discussion appear to vaguely suggest that they should be. Furthermore, the final sentence presents unsubstantiated speculation about what utilities *might* be considering; this claim should either be supported with credible source documentation or deleted.

These and other statements risk perpetuating misperceptions, narrow treatment of issues, or structural biases embedded in legacy regulatory approaches, which will not serve the greater

interests of modernizing the electric system. Further, these and other statements risk discrediting what should otherwise be a useful, fair, and authoritative summary of key observations, areas of debate, and recommendations for decision-makers.

To alleviate this concern, the manual should more explicitly identify those issues that remain contentious or subject to regional circumstance. To do so, we recommend that the manual organize discussions in a transparent and even-toned manner that presents the respective sides and key considerations of a topic. In cases where the body of evidence supports a position, the manual can offer recommendations in sections designated for that purpose.

This could be accomplished by the addition of *Perspectives* sections (or similar) that describe differences in stakeholder positions commonly heard on a subject. Key topics on which this approach would be valuable include, but are not limited to:

- Whether net metering under- or over-compensates distributed PV
- What is the magnitude of cost shifts resulting from distributed PV at varying penetrations
- Utility vs. third-party ownership of DERs
- Inclusion of a price on carbon (or other externalities) in DER valuation
- The choice of which cost tests to employ when assessing DER or other grid investments

b) Restructure the manual to improve usability and to identify takeaways

The draft manual would benefit from restructuring to support clear understanding of the relevant content. Issues and major topics are sometimes conflated within sections—or conversely, related topics are separated in the manual across different sections. This creates confusion and uncertainty for the reader as to what conclusions should be drawn from the discussion.

To address this concern, we suggest a formulaic approach that would allow readers to easily navigate topics and find sections as applicable. For example, each available valuation approach (i.e., rate designs and compensation methods) could be organized to clearly identify:

- (i) *Design Parameters* to identify choices the utility or regulator faces
- (ii) *Key Considerations* that are raised by the approach or specific parameters,
- (iii) *Case Studies* to briefly illustrate where the approach has been implemented,¹⁰ and
- (iv) *Recommendations* where appropriate
- (v) *Additional Reading* to provide references for further study

In a related vein, we suggest a revised table of contents and associated discussions for the manual as a whole, which would promote a more user-friendly structure and clear identification of key takeaways. We include one suggestion for how the revised manual could be organized in Appendix A.

¹⁰ In some cases in the draft manual, useful examples are cited in footnotes or woven into general discussions. These provide valuable case study material, and would be more helpful if explicitly identified in a “case study” subsection.

Appendix A: Alternative Organization for DER Compensation Manual

In the course of our review of the draft manual, our team found it helpful to visualize the ways in which sections link together thematically. As a result, we developed an alternative outline that integrates some of our suggested changes. We do not suggest that this is the “best” structure; revisions or addition of other topics would undoubtedly be required to improve this structure.

- I. Introduction
- II. Purpose of manual
 - a. What emerging needs and challenges does the manual seek to address?
 - b. What is the prioritized list of outcomes that will be the focus of attention throughout the manual?
- III. Ratemaking – Historical approach and limitations
 - a. Brief presentation of how cost-of-service ratemaking is conducted, and how this translates to rates
 - b. What are the limitations of this approach given the emergence of new technologies and societal needs?
 - c. Suggested further reading
- IV. DER services and technologies
 - a. Services
 - i. Distributed generation
 - ii. Load shifting
 - iii. Load shaping
 - iv. Load reduction (i.e. energy efficiency)
 - b. Distributed energy resources
 - i. Solar PV
 - ii. Energy storage
 - iii. Electric vehicles
 - iv. Grid-interactive water heaters
 - v. etc.
 - c. Enabling technologies
 - i. Grid-sited technologies
 - 1. AMI
 - 2. ADMS/DERMS
 - 3. Related communications infrastructure (e.g., fiber optic backbone, mesh radio networks, data storage and processing etc.)
 - ii. Customer-sited technologies
 - 1. Smart inverters
 - 2. Smart thermostats (or “programmable controllable thermostats”)
 - 3. Customer information systems (e.g., in-home-displays)
- V. Benefits and costs of resources
 - a. Benefits

- b. Costs
 - c. Benefit-cost analysis: Available approaches and key considerations
- VI. Rate Design Options

(Suggested organization for within sub-section is shown for volumetric rates; same organization is suggested but not shown for other options.)

 - a. Volumetric rates
 - i. Design parameters
 - ii. Key considerations
 - iii. Case studies
 - iv. Recommendations
 - v. Additional reading
 - b. Time-based rates
 - c. Demand charges
 - d. Fixed charges
 - e. Minimum bill
 - f. Other....?
- VII. DER Compensation Options

(Suggested organization for within sub-section is shown for net metering; same organization is suggested but not shown for other options.)

 - a. Net metering
 - i. Design parameters
 - ii. Key considerations
 - iii. Case studies
 - iv. Recommendations
 - v. Additional reading
 - b. Standby charges
 - c. Value of resource
 - d. Procurement processes, RFPs, etc.
 - e. Market-based pricing approaches (e.g., DLMP, transactive energy, etc.)
 - f. Platform business models
- VIII. Related issues for regulatory consideration

Brief and limited treatment of other issues that are related to DER compensation but less directly pertain to the subject at hand. Examples include:

 - a. Interconnection queue management
 - b. Ownership of DERs – options and considerations¹¹
 - c. Transitioning and grandfathering considerations
 - d. Vertically integrated vs. restructured markets – Key differences to take into account

¹¹ One helpful resource on DER ownership is *Who Should Own and Operate Distributed Energy Resources?*, by Michael O'Boyle, August 2015. Available at http://sepa51.org/phaseII/OBoyle_51stState_Addendum.pdf