September 2, 2016

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

RE: Comments on NARUC Distributed Energy Resources Compensation Manual

Dear President Kavulla and Members of the Staff Subcommittee on Rate Design:

Natural Resources Defense Council (NRDC)[1] offers these comments on the draft NARUC Distributed Energy Resources Compensation Manual (Draft Manual).

We are impressed by the depth and breadth of NARUC's examination of distributed energy resource (DER) compensation and rate design as the energy industry undergoes a rapid shift toward a cleaner, more sustainable system. The regulatory community in recent months has risen to this challenge at a time when stakeholders across the energy spectrum are in need of leadership. This is a time of incredible opportunity to work collaboratively on rate designs and valuation methodologies that, together with energy policies and programs, encourage the cleanest, most energy efficient and affordable systems possible.

Thank you, President Kavulla and the entire Subcommittee, for taking on these often-complicated issues at such a critical juncture, recognizing the need to think creatively, and for offering this opportunity for stakeholders to participate.

We respectfully submit the following comments and recommendations for consideration as the Subcommittee embarks on the next phase of development of the Draft Manual:

1. Include a dedicated, introductory section on the importance of good process in developing rate design and valuation methodologies for DERs;
2. To ensure that this dialogue continues, make the Draft Manual a "living document," make the Staff Subcommittee a permanent NARUC committee, and expand the transparency of the Draft Manual process;
3. Reconsider the treatment of rate design principles, in particular ensuring an appropriate balance of principles and policy considerations;
4. Correct assumptions about cost-shifting, emphasizing the importance of analysis, and balance discussion of the costs of DER with additional recognition of the benefits;

[1] NRDC is a non-profit international environmental organization, with offices in Washington, D.C., San Francisco, Los Angeles, Chicago, and Beijing. Founded in 1970, NRDC today has 2.4 million members and online activists nationwide and a staff of more than 400. Our skilled scientists, engineers, attorneys, finance experts, and policy advocates collaborate with a diverse group of partners to advocate for equitable, affordable, resilient, and safer energy systems, at the national, state, and local levels.

5. Expand discussion and address omissions/assumptions in the Compensation Methodologies section, particularly on valuation methods, net energy metering, and fixed charges.

We believe addressing these elements will yield a more complete and iterative document that will provide a clearer pathway for regulators as they navigate the increasingly complicated field of rate design in the coming years.

Note that NRDC also weighed in on the Draft Manual process via a series of letters submitted in June and July. First, we were signatories to a letter submitted on June 23, 2016 (included here as Attachment A), in which over 30 consumer, low-income, environmental, and clean energy advocates made fundamental process recommendations to the Subcommittee. Second, NRDC submitted our own letter on July 1, 2016, included here as Attachment B. Finally, we are also supportive of many of the points made in the June 2016 white paper submitted by the solar community in response to the Edison Electric Institute February 2016 "Primer on Rate Design for Residential Distributed Generation."

Thank you for your consideration, and we look forward to continued dialogue on these important issues.

1. **Add a dedicated section to the Draft Manual outlining a process for developing sound rate design and valuation methodologies for DERs**

There has been a lot of talk within the regulatory community in recent months about what constitutes "good process." And for good reason; as we all move into uncharted waters on rate design as the industry transforms, process becomes more important than ever.

NRDC noted in our July 1 letter (see Attachment B) that collaborative, inclusive, and constructive processes that occur on the record will result in more robust solutions that work for a variety of interests. We cannot overstate the importance of developing a roadmap for sound regulatory decision-making, and thus reiterate below the top-level recommendations made in the June 23 multi-sector process letter (Attachment A):

- Careful assessment of state conditions and an acknowledgement of the appropriate pace for rate design change;
- Data-driven rate design inquiries;
- Collaborative, upfront, open docketed processes that explore the range of rate design options in advance (or in lieu) of contested rate cases;
- Use of robust, reliable data from pilots, shadow rates and other reputable methods for novel or untested rate designs prior to wide-scale adoption;
- Consideration and accommodation for low-income and vulnerable customers in rate design; and
- Sufficient opportunity to educate customers on new/shifting rate designs, well in advance of their implementation and the development of tools to do so.

Taking the appropriate time to make these critical decisions and focusing on data-driven analyses warrant particular emphasis. While it is understandable that the industry may feel inclined to

move quickly in developing rate design options as DER grows across states and regions, we urge NARUC to stress the importance to regulators of taking the time necessary to get rate design right. As discussed later in these comments, the penetration of distributed generation (DG)[2] in particular across much of the country is still relatively low. This gives the industry, regulators and stakeholders the luxury of time to move deliberately and carefully with the proper data and analyses in place. Do state-specific conditions require immediate action, or should state regulators continue with monitoring and establish guideposts and goals for taking future action? As the Draft Manual notes, moving too far in one direction may drive self-generating customers to completely disconnect from the distribution system, a situation that no amount of rate design could remedy.[3] To be sure, the changes contemplated by regulators come with the risk of unintended consequences and should not be undertaken lightly, too quickly, or in *anticipation* of a future problem.

We urge the Subcommittee to consider including these process recommendations in the introduction of the Draft Manual to emphasize their foundational importance to regulators in getting rate design and valuation issues right.

2. **Make the Draft Manual a "living document," make permanent the Staff Subcommittee on Rate Design, and expand the transparency of the Draft Manual process**

The Draft Manual does a thorough job of identifying many of the issues related to DER valuation and rate design options –*as they stand today*. However, this is a rapidly evolving landscape. The market is constantly changing in response to quickly advancing technology, and this pace of change is likely to continue, alongside decreasing costs and customer uptake.

Thus, the subject matter of the Draft Manual is different from some of the more static topics that NARUC manuals have tackled in the past (like cost allocation, for example). Given the pace of change in DER technology, and the fact that it is early days yet for distributed resources in much of the country, there will be a need to revisit and revise the content and perspectives laid out in the Draft Manual. For example, the tone of the Draft Manual as currently drafted appears wary of DER as a "disruptive" technology, implying it is a problem that needs solving.[4] While it is not surprising that challenges arise in the early years of adoption of new technologies, the significant opportunities that DER brings about also warrant examination. These opportunities are likely to come into greater focus as time goes on, as the value and flexibility of distributed resources become more evident and intertwined with the evolving regulatory structure. How the energy

[2] The Draft Manual defines DER in broad terms initially (pages 15-20), but then appears to focus much of its discussion on valuation and rate design options in relation to certain types of DG (pages 22-59). We recommend that this be clarified, and the benefits of other types of DER included in the original definition (demand response, energy efficiency) be severed out into separate sections as appropriate. Notwithstanding this point, however, NRDC makes broad reference to DER throughout these comments, specifying DG where referring more specifically to distributed solar, typically solar photovoltaic (solar PV) systems.

[3] Draft Manual at 33.

[4] *See, e.g., id*. at 22, 34, 35.

community responds to the dynamic nature of DER is one of the most pressing utility regulatory issues of our time, and it warrants a similarly dynamic guidance document.

To accomplish this, we recommend that the Staff Subcommittee on Rate Design be made a permanent standing subcommittee attached to the Electricity Committee, with dedicated NARUC staff support. We recommend establishing a process and time frame for periodic review of the Draft Manual. This is essential to ensure that the content is relevant and sound, and that the guidance document proves useful, year in and year out, for the very regulators it is meant to assist.

On a related matter, we also suggest that NARUC develop a broader timeline for the next phase of the Draft Manual development process. We appreciate NARUC's openness throughout the last few months as it constructed the first draft. As we move into the next phase of refinement, we recommend that the Subcommittee make the current initial round of stakeholder comments public, and allow for a period of time for stakeholders to review and respond to their peers in the community, followed by a second round of revision before finalizing the manual. We believe this will provide all interested parties with the most fair and open process, and yield a more comprehensive manual.

3. Provide a more balanced treatment of rate design principles

As NRDC noted in our July 1 letter (Attachment B), rate design is public policy, developed to maximize the public interest—not just cost allocation. Several, often conflicting, principles must be balanced for an optimal outcome, and too much emphasis on one versus another, or the short-term over the long-term, can result in unintended consequences.

We recommend that this need for balancing be taken into further consideration in Section II of the Draft Manual (What is the Rate Design Process). The Draft Manual cites the seminal James Bonbright text (*Principles of Public Utility Rates*) as a useful guide for ratemaking in the context of DERs.[5] Looking to Bonbright to provide guidance in this area, as with other areas of ratemaking, is certainly appropriate. Yet, prior to doing so, the Draft Manual states that "[t]he basic purpose of rate design is to implement a set of rates for each rate class—residential, commercial, and industrial—that produces revenues to recover the cost of serving that rate class."[6] This elevates the principle that rate classes should not cross- subsidize one another above the other Bonbright considerations. We recommend that the Draft Manual refer to these principles without highlighting any one purpose of rate design above the others, addressing the full range of objectives.

We further recommend that the Draft Manual highlight (though not elevate above others) additional rate-setting principles, such as those found in general microeconomics, summarized recently in *The Economics of Fixed Cost Recovery by Utilities* by Severin Borenstein of UC

[5] *Id*. at 6-7.
[6] *Id*. at 6.

Berkeley's Energy Institute at Haas.[7] Religiously invoking Bonbright principles seals off electric utility rate design from other disciplines, and more recent knowledge, which could provide insight helpful to regulators.[8]

Similarly, application of the Bonbright principles is not formulaic and should not dictate any one specific answer. Thus, we also encourage the Subcommittee to consider including in its balancing of principles other important public policy objectives, such as equity and environmental objectives, and parameters for deployment of energy saving, management, storage and generation technologies. NRDC supports rate designs that help encourage the cleanest, most energy efficient and affordable systems possible. These objectives are laid out in more detail in our July 1 letter (Attachment B), and could be considered as additional policy options for regulators interested in incorporating them.

4. **Correct assumptions about cost-shifting, emphasizing the importance of analysis, and balance discussion of the costs of DER with additional recognition of the benefits**

Rate design on DERs should be informed by a fair, rigorous cost-benefit analysis that allows for flexibility (and at times) accommodates inherent uncertainties in the ratemaking process. Cost-benefit analysis is not a direct input into rate design—which should continue to be set based on marginal cost principles—but it is helpful in demonstrating whether and to what extent "cost-shifts" are, in fact, occurring, and whether some degree of cost shift is justified by the benefits of DERs.

It is thus a concern that the Draft Manual more often than not suggests that DER is a problem that needs solving. The Draft Manual places greater emphasis on DER costs rather than benefits, and assumes there is cost-shifting from those who have installed distributed generation (DG) to those who have not, all without empirically establishing that such cost-shifting is, *in fact*, occurring.

For example, the Draft Manual states:

> The economic pressures DER puts on the utility and non-DER customers within a rate class is one of the most divisive issues facing regulators today. These economic issues include revenue erosion and cost recovery issues as well as inter-class cost shifting apparent in traditional utility rate design and Net Energy Metering (NEM) discussions;[9]

[7] Severin Borenstein, *The Economics of Fixed Cost Recovery by Utilities (working paper)*, University of California Berkeley, Energy Institute at Haas (July 2016), available at https://ei.haas.berkeley.edu/research/papers/WP272.pdf.

[8] Importantly, Bonbright developed his principles in a time when the economics profession had not fully internalized the need for prices to reflect negative externalities—like carbon emissions—if prices are to generate optimal outcomes.

[9] Draft Manual at 22.

> Eliminating, or at least minimizing, the cross subsidies enjoyed by DER-owning customers has both efficiency implications and equity implications;[10]
>
> The biggest cross subsidy in energy pricing in restructured jurisdiction is when a NEM customer has a net export from their system and is compensated at their retail rate. This is clearly a subsidy to the NEM customer paid for by the general body of ratepayers.[11]

The Draft Manual could embrace a more balanced cost-benefit perspective by (as recommended above) creating a prominent process discussion in the introduction that folds data-driven inquiries into the full value of DG. Prior to the implementation of any new rate design that seeks to specifically address fairness concerns regarding DG policy, regulators should define and collect the data necessary to identify the costs and benefits of DG to *all customers*, and determine whether cost-shifting is truly occurring. "Value of distributed solar" inquiries can be important to contrast solar customer cost causation with system-wide benefits, such as those prepared for Minnesota[12] and Maine.[13] With regard to net energy metering (NEM), data that is starting to be collected in specific jurisdictions (including a report conducted by NRDC and SolarCity in Nevada) suggests that this approach can create net benefits for non-participating customers[14] (we provide further comment on the Draft Manual's treatment of valuation methodologies and NEM in in a later section).

In addition to addressing these empirical questions in a dedicated process section, we similarly recommend that the Draft Manual separate out its treatment of the impacts of DG on non-participating customers in a single section or subsection, rather than referring to them ad hoc whenever a particular cost is discussed. Similarly, the Draft Manual could be improved with references to the range of studies that have looked at the costs and benefits of solar PV and other types of DER in different jurisdictions (which we discuss in more detail in a later section of these comments).

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[10] *Id*. at 34.
[11] *Id*. at 35.
[12] John Ferrell, *Minnesota's Value of Solar: Can a Northern State's New Solar Policy Defuse Distributed Generation Battles?*, Institute for Self-Reliance (April 2014), available at http://ilsr.org/wp-content/uploads/2014/04/MN-Value-of-Solar-from-ILSR.pdf.
[13] Maine Public Utilities Commission, *Maine Distributed Solar Valuation Study* (March 1, 2015), available at http://www.nrcm.org/wp-content/uploads/2015/03/MPUCValueofSolarReport.pdf.
[14] *See,e.g.*, SolarCity, NRDC, *Distributed Energy Resources in Nevada: Quantifying the Net Benefits of Distributed Energy Resources* (May 2016), available at http://www.solarcity.com/sites/default/files/SolarCity-Distributed_Energy_Resources_in_Nevada.pdf; *see also* Mark Muro and Devashree Saha, Brookings Institute, *Rooftop Solar: Net Metering Is a Net Benefit* (May 23, 2016), available at https://www.brookings.edu/research/rooftop-solar-net-metering-is-a-net-benefit/. We note that the potential costs and benefits reflected in these studies are highly impacted by how the corresponding rates and incentives are designed, which could lead to either a more costly system, or to greater benefits. As with all elements of this discussion, the devil is in the details.

5. Expand discussion of, and address omissions/assumptions in the Compensation Methodologies Section

Sections IV and V of the Draft Manual include a fairly comprehensive list of methods and rate designs for determining how to compensate DERs. Several of these are discussed in a straightforward manner, including decoupling, time of use (TOU) rates, minimum bills[15] and demand charges.

However, we recommend that the Draft Manual be expanded to include a richer and more balanced discussion on NEM, Valuation Methodology, and Fixed Charges. We also ask that NARUC consider addressing some omissions and assumptions in those sections that, if left as they are, may mislead regulators about the nature of DG, its potential benefits, and the options available to regulators for facilitating the integration of distributed resources into the electric system in an affordable and efficient way.

a. Net Energy Metering

We appreciate that NEM is addressed with such prominence in the Draft Manual, but recommend that the Subcommittee revise a number of omissions and assumptions in its treatment of this mechanism. In particular, the Draft Manual often characterizes NEM as an approach to be wary of rather than a solution, at times over-stating complications with the mechanism[16] and assuming that cost-shifting abounds.

For example, the Draft Manual states, without empirical support:

> . . . NEM reduces not only the energy revenue of the utility but also the margin available for the coverage of other costs.[17]
>
> NEM customers do not compensate the system for the operational costs they impose on it.[18]
>
> . . . by overcompensating the NEM participants through their avoidance of kWh charges, NEM necessarily is imposing those avoided costs on the nonparticipants. In this view the nonparticipants are subsidizing the NEM participants.[19]

[15] NRDC regards decoupling, TOU rates, and minimum bills as among the more effective approaches to address reasonable utility revenue recovery while maintaining critical prices signals for consumers to conserve and invest in DERs, and (in the case of TOU) the most elegant and proven approach to reflect the temporal value of electricity services. We agree with the Regulatory Assistance Project that modern rate design should address differing costs of providing reliable electricity service at different hours and seasons. *See* Jim Lazar, *Use Great Caution in Design of Residential Demand Charges*, Natural Gas & Electricity Journal (February 2016), Vol. 32, Issue 7, pages 13–19.
[16] Draft Manual at 42-44.
[17] *Id*. at 43.
[18] *Id*.
[19] *Id*. at 44.

To remedy these concerns, we recommend that the Subcommittee consider addressing the following specific passages in its NEM discussion.

First, much of this can be addressed by expanding the review of the benefits that net metered customers bring to utility operations, other customers, and the system as a whole. The Draft Manual addresses some of these benefits in a short paragraph,[20] but then devotes nearly two pages to so-called "complications" with the mechanism.[21] This discussion can be improved by incorporating more of the existing analyses and literature already available on the cost-benefits of NEM, and (as above) ensuring that the Draft Manual is regularly updated to reflect the quick succession of reports on this subject that are already underway and will continue to accumulate in the coming years.

Second, the Draft Manual would be improved with a more complete discussion of considerations for states with low versus higher DG penetration.[22] In much of the country, the proportion of net metered customers to the overall customer base is still extremely small. We recommend that, particularly in those jurisdictions, the Draft Manual reflect the many expert recommendations that NEM be retained as a fair rate of compensation.[23] In jurisdictions such as California and Hawaii, where the penetration of solar PV customers is higher, regulators have been evaluating NEM to determine whether to retain it or to incorporate more granular mechanisms.[24] Regulators may find it useful to have a guide on this subject to evaluate at what point it is appropriate to undertake such an evaluation. The Draft Manual refers to a "relevant threshold" of DER penetration but does not describe what this means.[25] To remedy this, the discussion could be expanded to include state experiences (such as NEM 2.0 in California) where such evaluations have been undertaken in a more comprehensive manner.

Third, in characterizing net metered customers as a disruptive force, the Draft Manual misses an important opportunity to discuss the potential *value* that DER resources could bring to ensure safe, affordable, reliable electricity services if the rates and incentives are thoughtfully designed. For instance, the Draft Manual emphasizes benefits just to NEM customers of their use of the

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[20] *Id*. at 42.
[21] *Id*. at 42-44.
[22] The Draft Manual briefly notes the distinction between high and low penetration (pages 61-62), but it does not offer significant discussion of the important differences and the varying paths forward depending on these different penetration levels.
[23] For example, the Regulatory Assistance Project has indicated that at "low" levels of installation of distributed renewables (for example, under 5% of customers), few if any physical modifications are required to electric distribution systems. As RAP notes, the scenario changes once solar output exceeds total load on a given substation, such as in Hawaii, which has the highest solar PV penetration rates of any state (more than 10% of residential customers). *See* Jim Lazar and Wilson Gonzalez, *Smart Rate Design for a Smart Future*, at 7 (July 2015), available at http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-gonzalez-smart-rate-design-july2015.pdf.
[24] Tellingly, in early 2016 California regulators ruled on their NEM 2.0 docket, opting to retain the mechanism until 2019. *See* California Public Utilities Commission, *NEM Successor Tariff* (summary), available at http://www.cpuc.ca.gov/General.aspx?id=3934.
[25] Draft Manual at 24.

grid: the ability to produce power at one time and use it at another. But it does not adequately contextualize or discuss the benefits of this interaction *to utilities* and *non-participant customers*. It is well-documented that energy exported to the grid has a wide range of values to the utility. [26] Indeed, many jurisdictions that have fully evaluated this have found a net benefit to *all customers* from NEM policies. In the context of a California proceeding, for example, Energy & Environmental Economics (E3) developed a methodology for evaluating NEM costs and benefits, which has been used by a number of jurisdictions and includes quantification of a range of benefit categories.[27]

While the Draft Manual provides a relatively robust list of values provided by DER in the Valuation Methodology section (addressed later in these comments),[28] it does not discuss or even refer to many of these values elsewhere. One of these benefits in particular—capacity value—is missing from the NEM section, and we recommend that the Subcommittee include a discussion of this and other benefits in the final version. Solar, which makes up the vast majority of net metered DG, has a very high correlation with peak demand in most of the country.[29] While the capacity value of solar will decline as penetration increases (because it will shift net peak demand), in most of the country where penetration is still very low this value will continue to persist (and California and Hawaii are already finding solutions to the oversupply issue) [30]

Fourth, though the Draft Manual focuses on complications with NEM,[31] it does not discuss mechanisms to improve its structure or to otherwise maximize the benefits of DERs. For example, smart inverters can significantly improve the benefits of distributed solar, and could be considered for inclusion in the Draft Manual. The Draft Manual also appears to assume that "smart" meters that record minute-by-minute demand and distributed generation are now

[26] Brookings released a summary of reports this year, concluding that "a significant body of cost-benefit research conducted by PUCs, consultants, and research organizations provides substantial evidence that net metering is more often than not a net benefit to the grid and all ratepayers." *See* Mark Muro and Devashree Saha, Brookings Institute, *Rooftop Solar: Net Metering Is a Net Benefit* (May 23, 2016).
[27] These include: market price suppression; reliability and resilience improvement; equipment life extension; conservation voltage reduction; voltage and power quality; societal benefits; environmental compliance costs savings; fuel hedging; avoided carbon emissions costs; avoided criteria pollutant costs; transmission and distribution capacity; ancillary services; avoided capacity; energy and line losses; avoided energy. *See, e.g.*, E3's project page re NEM evaluations, available at https://www.ethree.com/public_projects/cpucNEM.php; *see also* California Public Utilities Commission Energy Division, *Net Energy Metering (NEM) Draft Cost Effectiveness Evaluation, NEM Study Introduction* (September 2013), available at https://ethree.com/documents/CSI/CPUC_NEM_Draft_Report_9-26-13.pdf.
[28] Draft Manual at 45.
[29] National Renewable Energy Laboratory, U.S. DOE, *Solar Energy and Capacity Value* (September 2013), available at http://www.nrel.gov/docs/fy13osti/57582.pdf
[30] *See, e.g.*, Jim Lazar from RAP's publications and blogs on this subject: *Blog: The Duck is Learning to Fly in California and Hawaii* (August 2016), available at http://www.raponline.org/duck-learning-fly-california-hawaii/; *Teaching the "Duck" to Fly, Second Edition* (February 2016), available at http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-teachingtheduck2-2016-feb-2.pdf.
[31] Draft Manual at 42-43.

universally available at very low cost.[32] The deployment of these meters is still controversial in many jurisdictions and their cost effectiveness remains disputed by a range of stakeholders. We recommend that NARUC consider adding a more full discussion of the costs and benefits of improved metering technology and other potential grid enhancements (like smart inverters).

Finally, the Draft Manual could be improved by addressing a few additional areas. It states that solar customers have no incentive to reduce demand.[33] But this is not entirely true. Prior to making the initial investment in solar PV, prospective solar customers have a significant incentive to find ways to cut their demand, so as to minimize the size of their installation and upfront costs. This is an untapped area for utility-run energy efficiency, and a critical opportunity for partnering and collaborating with the solar community. In addition, many NEM customers, particularly commercial customers, use their solar power at the time it is produced. The Draft Manual would be improved with data on the proportion of NEM power used instantaneously on site versus the proportion exported to the grid.

b. Valuation Methodologies

The Draft Manual's discussion of Valuation Methodology is timely, and could help states (such as New York) that are currently considering approaches to valuing DERs according to the benefits that they provide.

The Draft Manual comprehensively portrays the various components of the "value stack" that states should analyze as they consider adopting a valuation approach to crediting DERs.[34] It also points out that there can be disadvantages to using a valuation methodology to credit or compensate DER resources, observing that: "[o]ne detriment to this method is that it often requires subjective judgments and may allow for values that are not quantified in a rigorous manner. Another is that a process to determine both the list of items to be valued as well as the values themselves may be highly contested and prolonged."[35] This word of caution is appropriate, though it should not be the reason to forego a valuation inquiry in an otherwise ripe service territory. It is our experience that establishing a robust and accurate methodology requires significant time and resources, but that there is tremendous value when done right. Further, this point further emphasizes how essential it is that regulators proceed deliberately in considering replacements to NEM. For example, California regulators opted to retain NEM until 2019 with some modifications, but left the door open for more sophisticated approaches down the road (like valuation methodologies). This exhibits a steady hand and is a model of good process, ensuring that significant changes in DER compensation are undertaken carefully and with adequate data.

Apart from this section, we suggest that the Subcommittee revise the language addressing the environmental benefits of DERs. The final version should reconsider the suggestion that a resource should only receive value for any given benefit through one mechanism. The Draft

[32] *See, e.g.*, the discussion of advanced meters at the top of page 42 of the Draft Manual.
[33] Draft Manual at 44.
[34] *Id*. at 45.
[35] *Id*. at 46.

Manual states, for example, that if a resource receives credit for carbon emissions reductions through a renewable energy credit (REC), it should not also receive credit for those reductions through a value of resource crediting mechanism.[36] This is incorrect. Environmental values should not be double counted, true, but in many cases RECs do not adequately capture the full environmental value that DERs provide. RECs and the social cost of carbon are two different things: RECs attempt to capture the difference between wholesale power prices and the development cost of renewables, while the social cost of carbon seeks to monetize the damage caused by marginal emissions of carbon dioxide. Renewables are developed for reasons other than avoiding carbon emissions: avoiding emissions of criteria pollutants, for example.

Merely receiving *some* credit for a given type of attribute elsewhere does not end the discussion where that other mechanism does not *fully* value the attribute. In a case where another mechanism partially values a resource, it is appropriate to provide additional value through the tariff. For example, with regard to carbon value, a tariff can be constructed to provide a resource with credit based on the social cost of carbon, minus the value of a REC. Another possibility is to transfer the REC value to a state entity and credit the DER for the full social value.

Second, the Draft Manual states, without explanation, that ". . . a value for carbon avoidance should be based on market value, and should avoid alternative, non-market based values."[37] But this approach is not absolute. Where market values are not accurate, it may be appropriate for regulators to rely on administrative mechanisms to value carbon or other benefits provided by DER.

c. *Fixed Charges*

The Draft Manual does a good job of characterizing the current trend of utilities seeking rate designs that emphasis higher fixed charges and lower volumetric charges as more DERs come online.[38] It also fairly lays out the perspectives of the often-polarized pro- and anti-fixed charge camps.

While we realize there is a difference of opinion on the exact implications of fixed charge recovery (specifically the impacts on clean energy development and customer bills), we suggest that the Draft Manual expand its current treatment of this issue. We recommend that the Subcommittee sharpen its review of the increasing prevalence of fixed charge dockets, reference more specific expert perspectives, and reinforce statements that have been made both by individual state commissions regarding the impacts of customer charge increases on clean energy development and consumers more generally, as well as in prior NARUC guidance documents.

First, it may be useful for regulators confronting the question of whether to approve fixed charge hikes to have more information at their fingertips on the increasing prevalence of these proposals. The Draft Manual acknowledges that fixed charge recovery is common, stating that utilities "have been using various justifications to attempt to get increases in fixed charges for a

[36] *Id*.
[37] *Id*.
[38] *Id*. at 54-55.

century."[39] It further notes that utilities "have seized on the potential impacts [of DER] on other customers as a justification for increasing fixed charges."[40] To be sure, NRDC and other stakeholders have noted a marked increase in fixed charge requests in recent years, with such proposals pending in more than two dozen jurisdictions.[41] Specifics on this trend are worth noting in the Draft Manual, given how commonplace they have become.

Regulators may also find it instructive to know how their peers have been addressing these proposals, to give them further opportunities to inform and frame their own perspectives. Nearly three-quarters of the commission orders issued in 2015 either rejected outright higher fixed fees or modified them to be smaller, incremental increases.[42] For example, in rejecting an increase, the Missouri Public Service Commission noted in April 2015: "Residential customers should have as much control over the amount of their bills as possible so that they can reduce their monthly expenses by using less power, either for economic reasons or because of a general desire to conserve energy. Leaving the monthly charge where it is gives the customer more control."[43] In January 2015, the Illinois Commerce Commission stated: "it is patent that high customer charges mean the Companies' lowest users bear the brunt of rate increases, and subsidize the highest energy users."[44] Similarly, the Minnesota Public Utilities Commission found in May 2015 that increasing customer charges would give "not enough weight to affordability and energy conservation."[45] Regulators have come to these conclusions again and again with respect to the impacts of fixed charge increases.

Second, we recommend that the Subcommittee expand its discussion of which utility costs are fixed, and which should appropriately be allocated to the fixed charge. As it does with the fixed charge controversy more generally, the Draft Manual lays out the two schools of thought on utility costs when viewed through a temporal lens:

> It can be argued that the majority of a utility's costs are fixed. It can also be argued that the majority or entirety of a utility's costs are affected by the way customers utilize the service provided, making the costs variable. The two opinions vary mainly in the time horizon considered. Those who feel the appropriate time horizon is the short-term tend to

[39] *Id*.at 34.
[40] *Id*.
[41] List of pending regulatory matters available upon request.
[42] List of referenced commission decisions available upon request.
[43] *In the Matter of Union Electric Company, d/b/a Ameren Missouri's Tariff to Increase its Revenues for Electric Service*, Dkt. ER-2014-0258, Report and Order (April 2015), available at https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=ER-2014-0258&attach_id=2015025958.
[44] *North Shore Gas Company, The Peoples Gas Light and Coke Company, Proposed General Increase in Gas Rates*, Dkt. 14-0224, Order (January 2015), available at https://www.icc.illinois.gov/downloads/public/edocket/395392.pdf.
[45] *In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service*, Dkt. GR-13-868, Findings of Fact, Conclusions, and Order (May 2015), available at https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0F2C116-A233-426F-8726-FCB2FD40A1A1}&documentTitle=20155-110264-01.

identify more costs as fixed. Those who feel the appropriate time horizon is the long-term tend to identify more costs as variable.[46]

This discussion could be improved by acknowledging that prior NARUC documents have provided parallel guidance (though not weighing in specifically on the economic theory of long-term vs. short-term costs). In its 1992 cost allocation guidance, NARUC supported using only the marginal costs of customer attachment in developing a fixed charge.[47] Noting prior guidance such as this would provide more context for regulators as they weigh the relative merits of increasing fixed charges, and the unsubstantiated notion that *all* fixed costs should necessarily be collected in fixed charges.[48]

Finally, given the controversy over this issue, we recommend that the Draft Manual include a more extensive bibliography of expert resources on fixed charge recovery and impacts. The Draft Manual acknowledges the pitfalls of higher fixed charges (e.g. diluting the conservation incentive; sending inefficient prices signals, etc.),[49] as well as the reason utilities tend to seek this remedy in the first place (revenue stability).[50] But providing specific resources on the various perspectives on this issue is essential to arming regulators with the tools to render their own, jurisdiction-specific decisions. We recommend including, at a minimum, resources from the Regulatory Assistance Project,[51] Synapse and Consumers Union,[52] the clean energy nonprofit Ceres,[53] as well as individual reports prepared by states.[54]

Thank you again for the diligence with which this process has been undertaken, particularly to commission staff for their important work on the Subcommittee. We appreciate the opportunity to provide these comments and recommendations, and we encourage NARUC to consider them for inclusion in the final version of the Draft Manual.

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[46] Draft Manual at 30.
[47] NARUC, *Electric Utility Cost Allocation Manual*, January 1992.
[48] *See* Regulatory Assistance Project, *Pricing Do's and Don'ts* (2011), available at www.raponline.org/docs/RAP_Lazar_PricingDosandDonts_2011_04.pdf*; see also* RAP, *The Specter of Straight Fixed/Variable Rate Designs and the Exercise of Monopoly Power* (2015), available at http://www.raponline.org/document/download/id/7771.
[49] Draft Manual at 54-55.
[50] *Id*.
[51] *See, e.g.*, Regulatory Assistance Project, *Smart Rate Design for a Smart Future*. Subsequent to Smart Rate Design, RAP released a series of supplementary materials and appendices that provide more in-depth guidance on these issues, available at http://www.raponline.org/smart-rate-design/.
[52] Consumers Union, Synapse Energy Resources, *Caught In A Fix: Fixed Charges: Impacts and Alternatives* (February 2016), available at www.consumersunion.org/fixedcharges.
[53] Peter Kind, *Pathway to a 21st Century Electric Utility Model* (November 2015), available at http://www.ceres.org/press/press-releases/ceres-releases-report-proposing-new-21st-century-electric-utility-model-aligned-with-clean-energy-goals.
[54] *See, e.g.*, Christensen Associates, *Residential Rate Study for the Kansas Corporation Commission* (April 2012), available at http://www.kcc.state.ks.us/electric/residential_rate_study_final_20120411.pdf/AcroJS_DesignerJS.pdf%20-%20page=39.

Sincerely,

Samantha Williams
Staff Attorney and Clean Energy Advocate, Midwest Program

Miles Farmer
Legal Fellow, Energy & Transportation Program

Noah Long
Director, Western Energy Project

Dylan Sullivan
Senior Scientist, Energy Program

ATTACHMENT A

June 23, 2016

Hon. Travis Kavulla, President
National Association of Regulatory Utility Commissioners
1101 Vermont Ave., NW
Suite 200
Washington, D.C. 20005

Dear President Kavulla:

We are a representative group of consumer, low-income, environmental and technology-specific advocates who have joined forces to have frank discussions and increase understanding of the rapidly evolving electricity rate-design issues arising in today's fast-changing energy landscape. We believe in an electric power future that protects consumers and provides for the continued growth of clean, efficient and renewable energy. These changes will require regulators to pay close attention to how customers interact with and pay for the energy and services they use, as well as how utilities finance their capital investments.

Our organizations have not traditionally seen eye to eye on everything. But more and more these days, we're finding and forging common ground. For example, we agree that increases in fixed charges are among the least effective ways for utilities to adapt, particularly in light of the well-documented impacts on customer costs, conservation, equity and the ability for customers to control their energy bills. We think the fact that organizations from environmental, consumer and renewable energy perspectives are now working closely together on this issue speaks volumes about its importance, and it signals the inclusive and collaborative path forward needed to get good rate design done right.

As we've talked with one another, the conversation has increasingly turned to a more expansive notion of what "good" rate design looks like:

- It should include a *good process*; one that is transparent, fair, accessible and accountable.
- It should be based on *good data* and *transparent modeling* that are credible and available to all parties.
- And it should have a *good sense of timing*. Instead of the traditional confrontation in a contested rate-case proceeding, we should look for opportunities to engage collaboratively in formal, constructive stakeholder processes that explore new ways of moving forward together, even if it takes a little longer.

Regulatory Process Recommendations:

Outlined below are several regulatory process recommendations that we believe would improve the likelihood of success and manage any risk associated with change. Regulatory process was not a topic covered by NARUC's recent survey, so we are approaching it outside the survey and hope some of our recommendations and examples can find a place in the upcoming Manual. This

will also serve as a response to some of the views that Edison Electric Institute expressed in its Feb. 14, 2016, letter to NARUC's Subcommittee on Rate Design regarding rate design for residential distributed generation.

We are discussing this topic at this time because of the impact of new technologies on the utility business model, utility regulation and the allocation of utility system costs and benefits to consumers. It is broader than the impact of solar PV and net metering. The increased prevalence of energy efficiency, demand response, storage and electric transportation should also be explored as they continue to grow and more innovations and choices enter the market. We believe that with appropriate and equitable allocation of costs, these new technologies and customer options can provide many benefits, and we therefore support their cost-effective development and deployment.

We also believe that all customers should pay an equitable share for their use of the grid. But some in the utility industry have initially reacted to load loss from new technologies by citing solar customers and cost-shifts as equity reasons to impose new fixed charges or untested demand charges on *all* customers. Laying blame on any one technology and responding with short-term Band-Aids rather than long-term solutions is a missed opportunity. We are also concerned that imposing increased fixed charges or untested demand charges on all customers may stifle deployment of nascent technology, discourage innovation, reduce customer control over electricity costs and disproportionately harm low-use and low-income customers. Reviewing rate design and small-scale generation pricing options, given the changes taking place in the electricity sector, is a necessary and laudable act, but it should be put in perspective and done in a mindful, holistic way that is informed by substantiating data, particularly at the relatively low levels of solar penetration that currently exist in many of our states.

To that end, we applaud NARUC's action to establish the Subcommittee on Rate Design and its development of a Manual to assist state commissions. We advance a range of process ideas below to inform the development of that Manual because there is importance in doing it right – and risks to doing it wrong.

It is important to note that we, as a group, have discussed the 1961 Bonbright principles as a useful starting point in the analysis of a fair rate design. (The original 1961 Bonbright principles are more consumer- and small-customer oriented than the revised 1988 principles that EEI cites in its Feb. 14, 2016, letter.) However, application of the Bonbright principles is not formulaic and should not dictate any one specific answer. We believe it is prudent and necessary to augment the 1961 Bonbright principles to include important public policy objectives, including equity and environmental objectives, and parameters for deployment of energy saving, management, storage and generation technologies. Different state commissions may weigh the importance of the principles differently, depending on their goals. Options for change may also differ depending on factors like the availability of advanced metering. For these reasons, we do not reach consensus on a "best" solution for every state.

We do, however, offer specific recommendations on what a good regulatory *process* looks like in evaluating rate-design changes. They include the following and are discussed in more detail below:

- Assessment and analysis of state conditions and sound data when determining the need and pace for rate-design change;
- Collaborative, upfront, open, docketed processes that explore the range of rate-design options in advance of or in lieu of rate cases;
- Data-driven rate-design inquiries;
- Pilots and testing for novel or untested rate designs prior to wide-scale adoption;
- Consideration and accommodation for low-income and vulnerable customers in rate design; and
- Sufficient opportunity to educate customers on new/shifting rate designs well in advance of their implementation and the development of tools to do so.

Assessment and analysis. Understanding the pace for making change should be a first step. Do state-specific conditions require immediate action, or should state regulators continue with intentional monitoring and establish guideposts and goals for taking future action? Rate design changes come with the risk of unintended consequences and should not be undertaken lightly or in *anticipation* of a future problem. Iowa and Minnesota are good examples of states that are carefully assessing state-specific conditions and sound data when determining the need and pace for rate-design change.

Collaboration. Commissions should have processes available to discuss goals and assess different methodologies and their impacts outside traditional, contested rate cases. In an open, docketed process, stakeholders and regulators can evaluate the pros and cons of different rate-design alternatives based on clear policy goals. Regulators should require utilities to share any models upon which they base claims for cost shifts or other impacts so that stakeholders can run alternative scenarios. An open process can help regulators assess trade-offs and choose designs that meet the majority of goals, rather than being locked into binary yes/no choices. Mitigation measures can be taken in those areas where compromise needs to be pursued. These processes should be open and collaborative, designed to understand the pace of change, options available and impacts. In contrast, proposals in rate cases limit frank discussions, often have gaps in data, and by their very nature are adversarial. It is to all parties' benefit to avoid the public, adversarial rate-case confrontations that have taken place recently in states like Arizona, Utah, Nevada, Wisconsin and New Mexico.

Data-driven. During collaboration, commissions should start the process of defining and collecting the data necessary to inform future policy discussions. For solar PV, this data may include, but is not limited to, deployment rates and locations; diversity of system sizes deployed; load shapes; hourly production profiles, including south and west arrays; hourly line losses; distribution costs; and hourly load data for individual circuits. As EEI recognized in its letter,

"The electric system benefits (e.g. cost savings) attributable to DG can include energy, capacity, transmission and distribution (T&D) system deferral and line loss reductions, as well as environmental and other benefits as assessed in each jurisdiction." Collecting data to put actual numbers to these costs and benefits is an important step. The Iowa Utilities Board, for example, recently required utilities to conduct pilot projects and collect data to help inform the development of future policy or rule changes related to distributed generation. Minnesota's Department of Commerce-led Value of Solar methodology process is another good example of an open, data-driven process.

***Testing*.** Pilots, shadow-billing and opt-in rates are all widely accepted methods for testing new rate designs and managing risk prior to wide-scale adoption.

Special attention to low income/vulnerable population impact. While any process should include thorough analysis of anticipated impacts of rate design changes, particular attention should be given to low-income and vulnerable populations to ensure that rate design or the imposition of new costs do not undermine the home energy security of these households. The process should incorporate review and approval of effective programs and policies to mitigate these impacts.

***Consumer education*.** Some rate designs strive to change customer behavior through price signals. Customers must be able to respond and – critically – *understand* how to respond for these designs to be effective. Customer education is also a topic that should be mindfully explored.

There are many examples in the last few years of states making significant rate-design changes in a preemptive manner and without adequate support, creating a backlash that limits choices in the future. Such experiences incite political intervention and discourage consumers from reducing or shifting their energy use and investing in cleaner sources, even when warranted. Our organizations have expertise in this complex arena, and we are eager to engage with commissioners, utilities and other stakeholders nationwide to find common ground, limit areas of disagreement, and manage the risk associated with change for the benefit of customers, the environment and society.

Thank you for the opportunity to provide these process recommendations, and we encourage you to consider them for inclusion in the forthcoming rate design Manual.

Sincerely,

Dan Bakal, Ceres, Boston, MA

Shannon Baker-Branstetter, Consumers Union, Washington, D.C.

Lauren Bowen, Southern Environmental Law Center, Chapel Hill, NC

Montelle Clark, Oklahoma Sustainability Network, Tulsa, OK

John Colgan, Colgan Consulting, Springfield, IL

Andre Delattre, U.S. Public Interest Research Group (US PIRG), Chicago, IL

Bret Fanshaw, Environment America, Phoenix, AZ

John Farrell, Institute for Local Self-Reliance (ILSR), Minneapolis, MN

Sean Gallagher, Solar Energy Industries Association (SEIA), Washington, D.C.

Howard Geller, Southwest Energy Efficiency Project (SWEEP), Boulder, CO

Wendy Gerlitz, NW Energy Coalition, Portland, OR

Rick Gilliam, Vote Solar, Oakland, CA

Jennifer Gremmert, Energy Outreach Colorado, Denver, CO

Sophie Hayes, Utah Clean Energy, Salt Lake City, UT

John Howat, National Consumer Law Center (NCLC) on behalf of its low-income clients, Boston, MA

Tyler Huebner, RENEW Wisconsin, Madison, WI

Bob Jenks, Citizens' Utility Board of Oregon (Oregon CUB), Portland, OR

Douglas Jester, 5 Lakes Energy, Lansing, MI

Hudson B. Kingston, Minnesota Center for Environmental Advocacy, St. Paul, MN

Brad Klein, Environmental Law & Policy Center (ELPC), Chicago, IL

Mark LeBel, Acadia Center, Boston, MA

Joseph Otis Minott, Esq., Clean Air Council, Philadelphia, PA

Diane Munns, Environmental Defense Fund (EDF), Des Moines, IA

John Nielsen, Western Resources Advocates (WRA), Boulder, CO

Will Nissen and Holly Lahd, Fresh Energy, St. Paul MN

Kerwin Olson, Citizens Action Coalition, Indianapolis, IN

Jacqueline Patterson, National Association for the Advancement of Colored People (NAACP), Baltimore, MD

Karl R. Rábago, Pace Energy and Climate Center, Elisabeth Haub School of Law, White Plains, NY

Casey Roberts, Sierra Club, Denver, CO

Tom Starrs, SunPower Corporation, San Jose, CA

Mark Toney, Ph.D., The Utility Reform Network (TURN), San Francisco, CA

Samantha Williams, Natural Resources Defense Council (NRDC), Chicago, IL

cc: Hon. Nancy Lange, Chair, Committee on Energy Resources and the Environment

Hon. Edward S. Finley, Jr., Chair, Committee on Electricity

Hon. Brandon Presley, Chair, Committee on Consumer Affairs

Hon. Stan Wise, Chair, Committee on Gas

Hon. Alaina Burtenshaw, Chair, Committee on Water

Mr. Greg R. White, Executive Director

Mr. Christopher Villarreal, Chair, Staff Subcommittee on Rate Design

Members of Staff Subcommittee on Rate Design

ATTACHMENT B

To:	The Honorable Travis Kavulla, President, National Association of Regulatory Utility Commissioners (NARUC)
Cc:	NARUC Staff Subcommittee on Rate Design
From:	Natural Resources Defense Council (NRDC)
Date:	July 1, 2016
Subject:	Response to Edison Electric Institute "Primer on Rate Design;" NRDC Input on NARUC Manual on Distributed Energy Resources (DER) Compensation

NRDC strongly supports NARUC's leadership to proactively address the rapidly changing electricity landscape through its Staff Subcommittee on Rate Design. On June 23, 2016, we weighed in with over 30 consumer, low-income, environmental, and technology-specific advocates on fundamental process recommendations to the Subcommittee. We are also supportive of many of the points made in the June 2016 white paper submitted by SolarCity, AEE, SEIA, CalSEIA, TASC, Vote Solar, Technet, Sierra Club, and Environmental Defense Fund in response to the Edison Electric Institute (EEI) February 2016 "Primer on Rate Design for Residential Distributed Generation."

This memo emphasizes a few key supplemental points in response to the EEI Primer.

Specifically:

1. We support a collaborative, constructive process to yield more robust solutions;
2. Principles guiding rate design must be balanced and carefully interpreted. There is no principle that requires utility cost recovery be tied directly to rate design by category (e.g., fixed costs, to the extent they are indeed "fixed," need not be recovered through customer charges);
3. Rate design should consider all of the choices available to customers, not just DERs;
4. Many studies have shown little to no cost shifting as a result of DERs, in contrast to statements made in the EEI Primer. In general, rates should be based on a careful analysis of the particular circumstances present in each case;
5. Decoupling is a proven solution to ensuring reasonable, commission-approved cost recovery for utilities, while maintaining critical price signals for consumers to conserve and invest in DERs;
6. Time-varying electric rates, such as time-of-use (TOU) and critical peak pricing, are proven approaches to reflect the temporal value of electricity services.

We hope you find this material helpful as the Subcommittee develops its Manual, and we look forward to continued dialogue on these important issues.

A collaborative and constructive process will result in more robust solutions

As we all move into uncharted waters on rate design as the industry transforms, process becomes even more important than ever. Collaborative, inclusive, and constructive processes that occur on the record will result in more robust solutions that work for a variety of interests.

The multi-sector process recommendations letter sent to the Subcommittee on June 23 offers some specific recommendations on what a good regulatory process looks like in evaluating rate design changes. They include the following and are discussed in more detail in that letter:

- Careful assessment of state conditions and an acknowledgement of the appropriate pace for rate design change;
- Data-driven rate design inquiries;
- Collaborative, upfront, open docketed processes that explore the range of rate design options in advance of or in lieu of contested rate cases;
- Use of robust, reliable data from pilots, shadow rates and other reputable methods for novel or untested rate designs prior to wide-scale adoption;
- Consideration and accommodation for low-income and vulnerable customers in rate design; and
- Sufficient opportunity to educate customers on new/shifting rate designs, well in advance of their implementation and the development of tools to do so.

We urge the Subcommittee to adopt these process recommendations as part of the upcoming Manual to assist commissions in this changing environment.

Rate design principles must be balanced and carefully interpreted

Rate design is public policy—not just cost allocation—though it should be done with the intent of minimizing costs based on good data. Several, often conflicting, principles must be balanced for an optimal outcome, and too much emphasis on one versus another, or the short-term over the long-term, can result in unintended consequences.

Rate design principles should be interpreted in a way that addresses the full range of objectives. The EEI Primer looks at the Bonbright principles and puts forth one interpretation, largely leaving out important public policy and equity objectives. NRDC supports rate designs that, together with energy policies and programs, encourage the cleanest, most energy efficient and affordable systems possible. Optimizing rate design, or the prices that customers see, is not an easy thing to do; nor can it be done in isolation from our other energy and environmental policy objectives. Even a well-designed rate cannot by itself overcome the significant barriers to cost-effective energy efficiency, demand response or other clean energy resources. However, it can help if done right, or hurt if done poorly.

NRDC offers the following rate design principles to ensure clean, affordable, equitable, and reliable electric service as the regulatory community grapples with these challenging questions:

1. *Rate designs must support clean, affordable, equitable, reliable choices.*

   Costs for electric services should generally be allocated equitably to those who use them, providing appropriate incentives for customers and utilities to invest in energy efficiency and other clean solutions. At the same time, utilities should be afforded a reasonable opportunity to recover their revenue requirement, as authorized by regulators, in a timely manner regardless of fluctuations in electricity use. Rate designs exist (such as decoupling and TOU rates identified below) that can accomplish the at-times competing needs and goals of a variety of interests.

2. *The impacts of a rate design on all customers must be considered and protections for low-income customers must be provided*.

   Regardless of which rate design components are adopted, it is essential that the selected method provide customers with the necessary tools and information to respond, in particular to protect economically vulnerable customers. Changing the rate structure without giving customers these tools will unfairly penalize those who consume during expensive times, as well as those who may lack the *ability* to shift their use to accommodate or avoid certain cost structures, and may undermine the underlying goal of rate designs that seek to incent changes in consumption patterns.

3. *Fixed charges should be small, and utilities should primarily collect their costs through usage charges*.

   This approach encourages conservation and conveys the signal that "the less you use, the less you pay." Large fixed charges must be avoided, as they are not linked to energy consumption and provide no useful price signal to customers. Large fixed charges also reduce customer incentives to conserve energy and invest in DERs, and remove the opportunity for customers to control their energy bills.[1] For these reasons, if there is a customer charge at all, it should be small (reflecting just those short-run costs that vary by customer—service drop, meter, billing). Further, regulators should question the notion that fixed fees belong in fixed charges. Many "fixed" costs are not, in fact, fixed when

[1] *See, e.g.* Consumers Union, *Caught in a Fix: The Problem with Fixed Charges for Electricity*, February 2016 (confirming the detrimental impacts of high fixed charges on residential—particularly low- and fixed-income—customers), available at www.consumersunion.org/fixedcharges.

viewed on a longer time horizon (e.g. power plants, transmission lines, and distribution facilities, which are variable or "marginal," with respect to loads).[2]

4. *Rate designs should address time-varying costs of electricity service, where these variations are significant*.

   NRDC agrees with the Regulatory Assistance Project[3] that modern rate design should address differing costs of providing reliable electricity service at different hours and seasons.

5. *Novel/untested rate designs should be sufficiently vetted and supported by credible data*.

   While innovative rates and policies need not be exhaustively tested in every jurisdiction, they should be based on robust, credible evidence from pilots, shadow-billing, opt-in rates and other widely accepted methods.

Rate design should consider all of the choices available to customers, not just DERs

Rates should be carefully designed to consider impacts on all of the choices available to customers. These include energy efficiency investments, demand response technologies, electric vehicles, and storage, in addition to rooftop solar installations. Design should be focused on meeting customers' service needs and our energy and greenhouse gas reduction goals.

The EEI Primer assumes cost-shifting, when many studies have shown none

If the question is ensuring that every customer contributes their fair share to grid services, then those services must be objectively valued and the contribution of DERs to those services recognized. For example, prior to the implementation of any new rate design that seeks to specifically address fairness concerns regarding net metering policy, regulators should start the process of defining and collecting the data necessary to determine whether cost shifting is, in fact, occurring. For solar PV, this data may include, but is not limited to: deployment rates and locations; diversity of system sizes deployed, load shapes, hourly production profiles, including south and west arrays; hourly line losses; distribution planning costs; hourly load data for individual circuits; and avoided emissions and other environmental benefits.

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[2] *See* Regulatory Assistance Project, *Pricing Do's and Don'ts*, 2011, available at www.raponline.org/docs/RAP_Lazar_PricingDosandDonts_2011_04.pdf*; see also* RAP, *The Specter of Straight Fixed/Variable Rate Designs and the Exercise of Monopoly Power*, 2015, available at http://www.raponline.org/document/download/id/7771.

[3] Lazar, Jim, RAP, *Use Great Caution in Design of Residential Demand Charges*, Natural Gas & Electricity Journal, February 2016.

"Value of distributed solar" inquiries can also be important to contrast solar customer cost causation with system-wide benefits. However, for most jurisdictions net metering still provides a reasonable approximation of the balance of costs and benefits to compensate rooftop solar. At the low levels of rooftop solar penetration that are currently present in the vast majority of states, any potential shifting (to the extent it is occurring) is miniscule and it would be unnecessary to incur the level of cost and effort of added analysis and studies to develop a more precise measure.

Furthermore, in service areas where time-of-use pricing is employed, if/when the system peak moves toward the evening, the value of net metering payments in the middle of the afternoon will go down. Once rooftop solar grows to a more significant level of electricity generation in a state—like in California, Arizona and Hawaii—more detailed study of these issues is warranted and market and grid impact analytics can help inform the valuation process. The objective of specific analysis should be to minimize costs and maximize benefits to customers through appropriate technology, for example through use of smart inverters and effective distribution system investment, not solely to perfectly allocate those costs and benefits.

Decoupling is a proven solution to help utilities recover their reasonable costs

Decoupling addresses the issue of revenue erosion much more effectively and comprehensively than fixed or demand charges without reducing the volumetric signal that—critically—conveys to customers "the less you use, the less you pay."[4] Utilities should focus on meeting customers' service needs and our energy and greenhouse gas reduction goals. Revenue decoupling makes way for such a focus by rendering utilities indifferent to fluctuations in retail energy sales. The mechanism uses modest annual adjustments in rates to allow the utility to recover its authorized costs for system maintenance and modernization, no more and no less. In contrast to residential demand charges, decoupling has a decades-long track record of success and its impacts are well-known.[5]

Time-varying electricity rates, such as TOU and critical peak pricing, are proven approaches to valuing the time-varying costs of electricity services

TOU rates set different prices for fixed hours of the day on specified days of the week, with higher prices during peak electricity usage hours and lower prices during intermediate and off-peak hours, generally reflecting the difference in capacity and energy costs during those times. This approach imparts a critical cost-causation element to rates: customers pay for grid service in

[4] Further information on decoupling and its implementation can be found at: https://www.nrdc.org/sites/default/files/decoupling-utility-energy.pdf.

[5] *See* Graceful Systems LLC, *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs, and Observations*, December 2012, available at https://www.nrdc.org/experts/ralph-cavanagh/report-decoupling-transforming-utility-industry; *see also* Nissen, Will (Fresh Energy) and Williams, Samantha (NRDC), *The Link Between Decoupling and Success in Utility-Led Energy Efficiency*, The Electricity Journal, Vol. 29 (2016) at 59–65.

proportion to how much—and when—they use it. Critical peak pricing is a substantially raised price charged during critical events and during a specified time period (e.g., 3pm-6pm during a hot summer weekday) when high wholesale market prices or power system emergency conditions are observed or anticipated.

With data from advanced metering (to the extent commissions have determined that investment in these meters is cost-effective), we can readily collect information on actual energy usage during each hour of the month and usage during peak periods can be assigned the costs of peaking power supply resources and distribution capacity costs installed for peak hours. TOU and critical peak pricing sends more targeted signals to customers based on well-defined peak and off-peak periods of the month (not just a single hour). They are simpler, and their impacts on peak period usage are well-documented through experience and empirical evidence.[6]

TOU and critical peak rates can provide incentives for customers to use the grid more efficiently in the short and the long-term. But just like any rate approach, in order to accomplish these goals rates must also be carefully designed. The appropriate selection of time periods, cost differentials, consumer protections, and criteria for determining whether the rate is default or optional, are all crucial decisions for ensuring an effective time-varying rate.

Thank you for the opportunity to provide these principles and recommendations, and we encourage the Subcommittee to consider them for inclusion in the forthcoming rate design Manual.

Sincerely,

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[6] Data on the impact on total kWh consumption are less clear—there are outdated studies but little recent information.