

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

Electronic Application Of Kentucky Power Company	)	
For (1) A General Adjustment Of Its Rates For	)	
Electric Service; (2) Approval Of Tariffs And Riders;	)	
(3) Approval Of Accounting Practices To Establish	)	Case No. 2020-00174
Regulatory Assets And Liabilities; (4) Approval Of A	)	
Certificate Of Public Convenience And Necessity;	)	
And (5) All Other Required Approvals And Relief	)	

**SUPPLEMENTAL TESTIMONY OF KARL R. RÁBAGO  
ON BEHALF OF  
JOINT INTERVENORS**

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1 **INTRODUCTION AND OVERVIEW**

2 **Q. Please state your name, business address, and affiliation.**

3 A. My name is Karl R. Rábago. I am principal of Rábago Energy LLC, a Colorado limited  
4 liability company. My address is 2025 East 24<sup>th</sup> Avenue, Denver, Colorado.

5 **Q. On whose behalf are you appearing today?**

6 A. My testimony is filed on behalf of Joint Intervenors (“JI”), Mountain Association,  
7 Kentuckians for the Commonwealth, and Kentucky Solar Energy Society.

8 **Q. Have you previously given testimony in this current proceeding?**

9 A. No.

10 **Q. Please provide a summary of your background, experience, and qualifications.**

11 A. I have worked for more than 30 years in the electricity industry and related fields. I am  
12 actively involved in a wide range of electric utility issues across the United States. My  
13 previous employment experience includes Commissioner with the Public Utility  
14 Commission of Texas, Deputy Assistant Secretary with the U.S. Department of Energy,  
15 Vice President with Austin Energy, Executive Director of the Pace Energy and Climate  
16 Center, Managing Director with the Rocky Mountain Institute, and Director with AES  
17 Corporation, among others. I have earned a bachelor’s degree in management, a law  
18 degree, and two post-doctoral law degrees in military and environmental law. A detailed  
19 resume is attached as JI Exhibit 1.

20 **Q. Do you have specific experience relating to distributed energy resources, including**  
21 **distributed solar generation?**

22 A. Yes. I have extensive experience working in the field of distributed energy resources, a  
23 category of energy resources that includes distributed solar generation, energy efficiency,

1 energy management, energy storage, and other technologies and related services. That  
2 experience includes regulation of electric utilities in Texas, including review and  
3 approval of rates, tariffs, plans, and programs proposed by electric utilities. I co-authored  
4 the seminal treatise on distributed energy resource value, entitled “Small Is Profitable,”<sup>1</sup>  
5 when I was a managing director at the Rocky Mountain Institute. I have also published  
6 several articles and essays relating to the topic, as detailed in my resume. As a vice  
7 president for Distributed Energy Services for Austin Energy, I had responsibility for all  
8 of the utility’s customer-facing programs relating to distributed solar generation, energy  
9 efficiency, demand management, low-income weatherization, energy storage, electric  
10 transportation, building energy ratings and codes, and the utility’s electric vehicle  
11 initiatives. While with Austin Energy, one of the largest municipal electric utilities in the  
12 nation, I developed and implemented the nation’s first distributed solar tariff based on  
13 objective and comprehensive valuation of solar generation and avoided system energy  
14 costs, often referred to as the “Value of Solar Tariff.” At the U.S. Department of Energy,  
15 I was the federal executive responsible for the nation’s research, development, and  
16 deployment programs relating to renewable energy, energy efficiency, energy storage,  
17 and other advanced energy technologies in the Department’s Office of Utility  
18 Technologies. In my position with the Pace Energy and Climate Center, based at the Pace  
19 University Elisabeth Haub School of Law in White Plains, New York, I led a team  
20 actively engaged as a public interest intervenor in the ground-breaking “Reforming the  
21 Energy Vision” process administered by the New York Public Service Commission. I  
22 have engaged as an advisor and expert witness in more than 100 regulatory proceedings

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<sup>1</sup> Amory B. Lovins, et al., “*Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size*,” Rocky Mountain Institute (2003). Witness Rábago was a co-author of the book.

1 across the country, including many relating to distributed energy resources of all kinds,  
2 rates and tariffs, low-income energy issues, grid modernization, return on equity, and  
3 other issues. I served as a contributing author and advisor in the writing and publication  
4 of the National Standard Practice Manual for Benefit-Cost Analysis of Distributed  
5 Energy Resources (“NSPM-DER”), published by the National Energy Screening Project.<sup>2</sup>  
6 The NSPM-DER sets out detailed guidance for establishing a benefit-cost analysis  
7 framework that can support jurisdictionally-specific evaluations of all manner of  
8 distributed energy resources (“DER”), which includes distributed generation (“DG”),  
9 demand response, energy efficiency, distributed storage, and others. The NSPM-DER  
10 compiled best practices guidance through an intentionally inclusive process of drafting,  
11 commenting, and revising supported by a range of authors and reviewers. I also play a  
12 leading role in the Local Solar for All<sup>3</sup> coalition, on behalf of the Coalition for  
13 Community Solar Access, a trade association for providers and developers of community  
14 solar services and facilities across the U.S. Local Solar for All has members from solar  
15 businesses and advocacy organizations. Most notably, Local Solar for All published the  
16 “Local Solar Roadmap” in December of 2020.<sup>4</sup> The Roadmap study relied upon a  
17 modern, high-resolution analysis of the electric grid in the continental United States. The  
18 study, conducted by Vibrant Clean Energy using its powerful WIS:dom-P® model, found  
19 that by coordinating and optimizing DERs in production cost and capacity expansion

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<sup>2</sup> T. Woolf, et al, *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*, National Energy Screening Project (Aug. 2020). Available at: <https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/>. While the NSPM-DER was published recently, it reflects best practices articulated in a prior NSPM for efficiency resources and generally recognized in the industry.

<sup>3</sup> Local Solar for All. More information at <https://www.localsolarforall.org>.

<sup>4</sup> Local Solar for All, *Local Solar Roadmap* (Dec. 2020), available at: <https://www.localsolarforall.org/roadmap>.

1 analysis, the added deployment of 273 GW of local solar and storage could yield nearly  
2 \$500 billion in savings and create more than two million incremental jobs over the kind  
3 of business-as-usual approaches typically favored by monopoly utilities, all while  
4 eliminating 95% of carbon emissions from the grid by 2050. I am a frequent speaker,  
5 author, and commentator on issues relating to electric utility regulation, distributed  
6 energy resource markets and technologies, and electricity sector market reform.

7 **Q. Have you previously testified before the Kentucky Public Service Commission**  
8 **(“Commission”) or other regulatory agencies?**

9 A. I appeared before the Commission and submitted public comments on behalf of  
10 Kentuckians for the Commonwealth and MACED (now Mountain Association) in Case  
11 No. 2019-00256.<sup>5</sup> In the past nine years, I have submitted testimony, comments, or  
12 presentations in proceedings in Alabama, Arkansas, Arizona, California, Colorado,  
13 Connecticut, District of Columbia, Florida, Georgia, Guam, Hawaii, Illinois, Indiana,  
14 Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Missouri,  
15 Nevada, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Puerto Rico,  
16 Rhode Island, Vermont, Virginia, Washington, and Wisconsin. I have also testified  
17 before the U.S. Congress and have been a participant in comments and briefs filed at  
18 several federal agencies and courts. A listing of my previous testimony is attached as JI  
19 Exhibit 2.

20 **Q. What is the purpose of your testimony?**

21 A. My testimony provides a framework for evaluation of cost and benefits in order to design  
22 and evaluate a tariff for net metered customer generators that is fair, just, and reasonable,

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<sup>5</sup> Given the relationship of that proceeding to this one, I incorporate those public comments by reference and adopt them as if my own testimony.

1 as required by Kentucky law and policy. I recommend that the Commission direct the  
2 Kentucky Power Company (“Company”) to use the framework that I propose, which is  
3 drawn from the NSPM-DER, and which is substantially the same as the evaluation  
4 method used in Value of Solar studies, in conducting an evaluation of benefits and costs  
5 relating to the operation of net metered facilities. My testimony builds on and adopts the  
6 prior submitted testimony of JI witnesses McDonald and Owen, and the arguments and  
7 assertions contained in briefs filed on behalf of JI parties, which I incorporate by  
8 reference and adopt as if my own testimony.

9 **Q. What is your understanding of the procedural and decisional posture of this case?**

10 A. In this case, the Company proposed to close its current Net Metering Service tariff  
11 (“NMS 1”) effective January 1, 2021, and to require that new customer generators take  
12 service under a proposed Tariff NMS II only. As proposed, NMS II would eliminate  
13 netting in favor of two-channel billing within two daily time blocks and provide  
14 compensation for instantaneous excess production within a time block at a wholesale  
15 avoided cost rate. Citing a lack of evidence to support a conclusion that the Company’s  
16 proposal would result in rates that are fair, just, and reasonable, the Commission deferred  
17 a final decision on the Company’s proposal and established a procedural schedule to  
18 enable all parties to more fully develop the record.<sup>6</sup>

19 **Q. How would you characterize the substance of the Company’s NMS II proposal?**

20 A. The Company has not put into the record substantial and competent evidence to support  
21 its NMS II proposal, and has failed to carry its burden of proposing a tariff that will result  
22 in fair, just, and reasonable rates.<sup>7</sup> The Company’s proposal would substantially

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<sup>6</sup> Order on rehearing at 11.

<sup>7</sup> *Id.* at 26.

1           undermine the value proposition for private investment in DG and effectively seek the  
2           Commission’s support in confiscating investment-backed benefits from its own  
3           customers. The Company’s proposal would, by crippling a small DG industry in  
4           Kentucky, deny the Commonwealth the benefits that DG development and operation  
5           would produce. The Company would take all this action without any foundation in cost  
6           of service data or any objective and transparent method to calculate the costs and benefits  
7           of DG deployment and operation. The Company does not explain how net metering  
8           customers will have to engage with the time of use elements of the proposed tariff even  
9           though the Company has not deployed AMI.<sup>8</sup>

10 **Q.   Do you know why the Company is proposing punitive and confiscatory rates for net**  
11 **metering customers?**

12 A.   Not fully, due to the lack of evidence in the record. The Company is clearly focused on  
13       collecting revenues from self-generation customers as if they did not reduce their use of  
14       Company-provided energy services in order to cover fixed costs the Company has  
15       accrued.<sup>9</sup> Of course, reduction in use should result in reductions in charges, and to single  
16       out customers that reduce use due to self-generation for punitive rates constitutes unjust  
17       discrimination unless the proposed rate is substantiated by competent evidence. The  
18       Company views customers who self-generate as causing a cost shift to non-generating  
19       customers,<sup>10</sup> but provides no evidence based on a cost of service study that self-  
20       generators cost more, or less, to serve. The many studies cited by JI witness Owen in his  
21       testimony establish that under a full, fair, and transparent assessment of costs and

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<sup>8</sup> Company response to JI-SDR-11

<sup>9</sup> KPC Post-Hearing Brief at 96.

<sup>10</sup> Id.

1 benefits, the net benefits of DG typically exceed the locally prevailing retail rate. The  
2 Company was selective in its assessment of costs that are avoided by DG in order to  
3 propose a sudden and dramatic reduction in the compensation rate for energy injections.<sup>11</sup>  
4 The Company's approach, however, is that the Commission should support a kind of  
5 piece-meal rate making for DG compensation that is economically inefficient and, again,  
6 discriminatory. The Company asserts that this confiscatory compensation rate is  
7 necessary to mitigate against a claimed subsidy to net metering customers that it did not  
8 substantiate.<sup>12</sup> In fact, the Company reports that it will address alleged subsidies for the  
9 very first time in supplemental testimony that it intends to file in this proceeding.<sup>13</sup>  
10 Again, however, the evidence in jurisdictions that have sponsored transparent and  
11 comprehensive assessments of the costs and benefits of DG is that customers that install  
12 and operate such systems are typically subsidizing both the utility and non-generating  
13 customers.

14 **Q. In light of all these deficiencies in the Company's proposal and the foundations for**  
15 **its proposal, why would the Company assert that it has offered a tariff that will**  
16 **result in fair, just, and reasonable rates?**

17 A. The lack of substantial evidence and the vigor with which the Company is defending its  
18 meritless tariff proposal leads me to conclude that the Company seeks approval of its  
19 tariff in order to stifle, if not eliminate, the likelihood of customers deploying self-  
20 generation. It appears to be an effort to enlist the Commission in helping the Company  
21 maintain economic domination over electric generation in its service territory by making

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<sup>11</sup> *Id.* at 97.

<sup>12</sup> *Id.* at 98.

<sup>13</sup> Company response to JI-SDR-07.



1 self-generation a difficult and uneconomic proposition for its customers. A tariff that has  
2 such effect, regardless of motivations, will not be fair, just, or reasonable.

3 **BENEFIT-COST ANALYSIS AS A FOUNDATION FOR NET METERING RATES**

4 **Q. How then can the Commission ensure that any net metering tariff that it approves**  
5 **will result in fair, just, and reasonable rates?**

6 A. The Commission has already explained that the rate making process must examine the  
7 quantifiable benefits and costs of net-metered systems in light of the utility's unique  
8 characteristics and the specific cost of serving the utility's customers.<sup>14</sup> The Commission  
9 has the broad authority to consider all relevant factors in the context of a rate proceeding  
10 such as this one regarding evidence of the quantifiable benefits and costs of a net-metered  
11 system.<sup>15</sup>

12 **Q. In light of the Commission's responsibilities and authority, how best should it**  
13 **proceed?**

14 A. The best and most common place for the Commission to start is by compelling the utility  
15 to base its rate proposal on a transparent and comprehensive assessment of the costs and  
16 benefits of customer generation. Because the Commission must ultimately decide the net  
17 metering tariff issue for each utility that it regulates, best practices from other  
18 jurisdictions countenance the Commission requiring that the analysis be undertaken under  
19 a common analytical framework that can also incorporate utility-specific facts and  
20 circumstances.

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<sup>14</sup> Letter from Public Service Commission to Senator Brandon Smith, February 18, 2019, cited in JI Post Hearing Brief at 6.

<sup>15</sup> *Id.*

1 **Q. Why do you say that requiring the use of a common analytical framework for**  
2 **benefit-cost analysis (“BCA”) is best practice?**

3 A. The concept of standardized BCA frameworks goes back nearly 40 years in the U.S.,  
4 when the California Standard Practice Manual was published in 1983.<sup>16</sup> Indeed, the  
5 common use of standardized frameworks to evaluate energy efficiency programs has  
6 improved the stock and performance of such programs to the extent that it is now  
7 common knowledge that efficiency is the least expensive energy resource everywhere.

8 **Q. How else have standardized BCA framework approaches been used?**

9 A. Over the past 40 years, state regulatory commissions have developed, shared, and  
10 adopted common methods and evaluation frameworks for calculating wholesale avoided  
11 cost rates. While each state adapts these methods to address specific local conditions, a  
12 strong non-utility wholesale generation sector has emerged in many states, saving  
13 customers significant amounts of money.

14 **Q. What is the relationship between BCAs and Value of Solar studies?**

15 A. As already noted, the Value of Solar concept is at heart a BCA, specialized to distributed  
16 solar production. As early as 2013, when I co-authored the “A Regulator’s Guidebook:  
17 Calculating the Benefits and Costs of Distributed Solar,”<sup>17</sup> the methods and metrics of  
18 best practices Value of Solar studies were already identifiable. That reference lists the  
19 key categories of impacts that should be assessed and describes methods to quantify those  
20 impacts. Transparent and comprehensive evaluations of the value of solar and of

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<sup>16</sup> See, generally, California PUC, *California Standard Practice Manual*, Regulatory Assistance Project (Oct. 1, 2001), available at: <https://www.raonline.org/knowledge-center/california-standard-practice-manual/>.

<sup>17</sup> “A Regulator’s Guidebook: Calculating the Benefits and Costs of Distributed Solar,” available at: [http://www.irecusa.org/wp-content/uploads/2013/10/IREC\\_Rabago\\_Regulators-Guidebook-to-Assessing-Benefits-and-Costs-of-DSG.pdf](http://www.irecusa.org/wp-content/uploads/2013/10/IREC_Rabago_Regulators-Guidebook-to-Assessing-Benefits-and-Costs-of-DSG.pdf).

1 distributed energy resources (“DER”) have tracked the guidance in the Regulator’s  
2 Guidebook to describe and quantify costs and benefits resulting from the production of  
3 energy by DG facilities over the useful life of facilities. Again, many of those reports are  
4 cited in JI witness Owen’s testimony. It is important to note that the most useful reports  
5 use a fairly standardized analysis framework and transparently document the methods  
6 chosen for calculating costs and benefits.

7 **Q. Can you point to a single best example of value of solar analysis?**

8 A. In my opinion, the “gold standard” for such analysis is the work done in Minnesota, by  
9 Clean Power Research, published in 2014.<sup>18</sup> That report was the product of a multi-  
10 stakeholder process and the report fully documents the methods and results. The study  
11 was reviewed multiple times by the Minnesota Public Service Commission, and the  
12 methodology was adopted for informing compensation rates for community solar  
13 projects. Today, the Minnesota Community Solar program leads the nation.<sup>19</sup> The  
14 valuation is regularly updated using a public process, another benefit of adopting a  
15 framework approach to benefit-cost analysis.

16 **Q. Are there any other examples you wish to cite that demonstrate the benefits of**  
17 **standardized BCA frameworks for evaluating the impacts and cost effectiveness of**  
18 **programs, rates, or investments?**

19 A. Yes. During the past fifteen years, utilities have invested billions of dollars through smart  
20 grid, grid modernization, and/or power sector transformation initiatives. Standardized  
21 BCA frameworks have been central to the leading efforts in this regard. I was personally

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<sup>18</sup> Clean Power Research, *Minnesota Value of Solar: Methodology*, Minnesota Department of Commerce (Mar. 2014), available at: <https://www.cleanpower.com/research/economic-valuation-research/>.

<sup>19</sup> See J. Farrell, *Why Minnesota’s Community Solar Program is the Best*, Institute for Local Self-Reliance (5 Feb. 2021—updated monthly), available at: <https://ilsr.org/minnesotas-community-solar-program/>.

1 involved in two such processes that I would commend to the Commission’s attention.  
2 Perhaps one of the most comprehensive transformation initiatives was that initiated by  
3 New York, styled New York REV (for “Reforming the Energy Vision”). This proceeding  
4 resulted in the institution of a Value of DER proceeding and comprehensive distribution  
5 system planning processes that included a BCA Framework.<sup>20</sup> The Pace Energy and  
6 Climate Center, which I led, was a public interest intervenor in the REV process. In the  
7 words of the NY Commission’s order, the BCA Framework was premised on a number  
8 of foundational principles which I also recommend that the Commission adapt and adopt  
9 for Kentucky:

10 The BCA analysis should: 1) be based on transparent assumptions and  
11 methodologies; list all benefits and costs including those that are localized and  
12 more granular; 2) avoid combining or conflating different benefits and costs; 3)  
13 assess portfolios rather than individual measures or investments (allowing for  
14 consideration of potential synergies and economies among measures); 4) address  
15 the full lifetime of the investment while reflecting sensitivities on key  
16 assumptions; and, 5) compare benefits and costs to traditional alternatives instead  
17 of valuing them in isolation.<sup>21</sup>

18 **Q. Do you wish to cite any other examples of states adopting a BCA Framework?**

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<sup>20</sup> See NY PSC, *Order Establishing the Benefit Cost Analysis Framework*, Case 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision (Jan. 21, 2016), available at: <https://www3.dps.ny.gov/W/PSCWeb.nsf/All/C12C0A18F55877E785257E6F005D533E>.

<sup>21</sup> *Id.* at 2.

1 A. Yes. I would also direct the Commission’s attention to the Docket 4600 proceeding  
2 conducted by the Rhode Island Public Utilities Commission from 2016 to 2017.<sup>22</sup> I  
3 participated in that proceeding on behalf of New Energy, Inc. The RI PUC initiated that  
4 proceeding, informed by a multi-party stakeholder working group’s work, to seek  
5 answers to several questions, notably:

6 What attributes are possible to measure on the electric system and why should  
7 they be measured? This overarching question can be further broken down into  
8 three broad questions:

- 9 1. What are the costs and benefits that can be applied across any and/or all  
10 programs, identifying each and whether each is aligned with state policy?
- 11 2. At what level should these costs and benefits be quantified—where  
12 physically on the system and where in cost-allocation and rates? and
- 13 3. How can we best measure these costs and benefits at these levels—what  
14 level of visibility is required on the system and how is that visibility  
15 accomplished?<sup>23</sup>

16 In 2017, the RI Docket 4600 working group delivered to the RI PUC a final report that  
17 addressed two key topics, namely, (1) how to better evaluate the benefits and costs of a  
18 wide range of technologies, programs, and investments; and (2) how rate design should  
19 evolve in Rhode Island over time.<sup>24</sup> The RI Docket 4600 Stakeholder Working Group,

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<sup>22</sup> RI PUC, In Re: Investigation into the Changing Distribution System and the Modernization of Rates in Light of the Changing Distribution System, Docket No. 4600. Documents available at: <http://www.ripuc.ri.gov/eventsactions/docket/4600page.html>.

<sup>23</sup> RI PUC Docket No. 4600, *Notice of Commencement of Docket and Invitation for Stakeholders Participation*, RI PUC (Mar. 18. 2016), available at: <http://www.ripuc.ri.gov/eventsactions/docket/4600page.html>.

<sup>24</sup> Raab Associates, et al., *Docket 4600: Stakeholder Working Group Process Report to the Rhode Island Public Utilities Commission*, RI PUC Docket No. 4600 (Apr. 5, 2017), available at: [http://www.ripuc.ri.gov/eventsactions/docket/4600-WGReport\\_4-5-17.pdf](http://www.ripuc.ri.gov/eventsactions/docket/4600-WGReport_4-5-17.pdf).

1 which included utility, developer, consumer, regulatory, and economic development  
2 stakeholders, delivered a report that established a Rhode Island Benefit-Cost Framework  
3 and several rate design recommendations.<sup>25</sup> The RI PUC accepted the report and issued  
4 directives for further work in July 2017.<sup>26</sup> The process and RI PUC orders set the stage  
5 for power sector transformation work that was a priority for that state.

6 **Q. Is there value to establishing and employing a BCA Framework even if a state is not**  
7 **pursuing utility sector transformation as in New York and Rhode Island?**

8 A. Absolutely. A BCA Framework can lead to clarity in understanding and communication  
9 between utilities, regulators, and stakeholders about benefit and cost impacts. A BCA  
10 Framework is essential to establishing fair, just, and reasonable rates for DER services  
11 and technologies. A BCA Framework can provide a platform for evaluating and  
12 prioritizing grid modernization and other investment decisions. A BCA Framework can  
13 provide a mechanism for examining interactive, portfolio, and competitive effects  
14 between programs and rate structures. And, over the long-term, a BCA Framework can  
15 provide essential analytical rigor to agendas as big as utility sector transformation. The  
16 instant case and those on the Commission's agenda for other utilities provide, in my  
17 opinion, all the justification necessary for the Commission to direct the Company to  
18 develop and propose a BCA Framework in the ordering language it issues in this  
19 supplemental proceeding.

20 **Q. What do you conclude based on this review of the ways in which BCA frameworks**  
21 **have been developed and used in the examples that you cite?**

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<sup>25</sup> *Id.*

<sup>26</sup> RI PUC, *PUC Report and Order No. 22851 Accepting Stakeholder Report*, RI PUC Docket No. 4600 (Jul. 31, 2017), available at: [http://www.ripuc.ri.gov/eventsactions/docket/4600-NGrid-Ord22851\\_7-31-17.pdf](http://www.ripuc.ri.gov/eventsactions/docket/4600-NGrid-Ord22851_7-31-17.pdf).

1 A. While the examples are illustrative and not exhaustive, they reveal the benefits of using a  
2 BCA Framework approach to address many of the most important issues facing electric  
3 utility regulators and electric utilities today. A consistent and well-structured BCA  
4 Framework can be applied to program evaluation, investment decision making, and rate  
5 design. More directly, these efforts reveal just how far the Company’s approach is from  
6 best practices.

7 **Q. What do you recommend to the Commission based on this finding?**

8 A. The Commission should direct the Company to develop and propose a BCA Framework  
9 as the foundation for its proposal for a tariff to replace its NMS I tariff. That BCA  
10 Framework should be shared with Commission staff and stakeholders and improved  
11 based on input from those parties. And then, the Company should develop and propose a  
12 new NMS II tariff design that aligns with the BCA analysis performed in accordance with  
13 the approved and vetted BCA Framework.

14 **BCA FRAMEWORK RECOMMENDATIONS**

15 **Q. Do you have specific recommendations as to how the Company should be required**  
16 **to develop and structure a BCA Framework and use that Framework to perform an**  
17 **analysis of any net metering tariff proposal?**

18 A. Yes. Fortunately, the decades of work invested in sound BCA processes yielded a  
19 consensus among leading practitioners as to the elements of best-practices BCAs. That  
20 consensus is documented in the NSPM-DER, published in August of 2020. While the  
21 Company is aware of the NSPM-DER, it did not rely on the Manual’s best practices  
22 guidance in formulating its net metering tariff proposal.<sup>27</sup>

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<sup>27</sup> Company response to JI-SDR-01.

1 **Q. What process or methodology recommendations did the Company rely upon in**  
2 **developing its NMS II tariff recommendation?**

3 A. The Company asserts, rather vaguely, that “it relied upon the decades of cost of service,  
4 cost allocation, rate design and tariff experience of its regulatory pricing team to design  
5 the Company’s NMS II proposal.”<sup>28</sup> In my view, this is not an adequate foundation for a  
6 finding that its proposal would result in fair, just, and reasonable rates.

7 **Q. In your opinion, should the Company be directed to follow the specific**  
8 **recommendations of the NSPM-DER only?**

9 A. The NSPM-DER is a comprehensive document that includes guiding principles,  
10 recommended process steps, impact category lists, definitions, and specific guidance on a  
11 wide range of issues associated with developing a BCA Framework and conducting cost  
12 effectiveness analysis. It would be wise for the Company to take advantage of the  
13 comprehensive and integrated nature of its recommendation, but it is not absolutely  
14 necessary. A substantially equivalent approach will also work, though I am unaware of  
15 any similarly comprehensive and up-to-date alternative, and the Company certainly did  
16 not rely upon one.

17 **Q. What, then, does the NSPM-DER recommend?**

18 A. The entire NSPM-DER guidance document is 300 pages in length, including several  
19 appendices. In this testimony I only highlight key elements of the entire NSPM-DER that  
20 the Commission should direct the Company to follow. First, the NSPM-DER sets out  
21 eight guiding principles that the Company should be directed to follow. These principles  
22 are summarized as follows:<sup>29</sup>

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<sup>28</sup> *Id.*

<sup>29</sup> NSPM-DER Ch. 2.



1 Principle 1 - Treat DERs as a Utility System Resource.

2 DERs are one of many energy resources that can be deployed to meet  
3 utility/power system needs. DERs should therefore be compared with  
4 other energy resources, including other DERs, using consistent methods  
5 and assumptions to avoid bias across resource investment decisions.

6 Principle 2 - Align with Policy Goals

7 Jurisdictions invest in or support energy resources to meet a variety of  
8 goals and objectives. The primary cost-effectiveness test should therefore  
9 reflect this intent by accounting for the jurisdiction's applicable policy  
10 goals and objectives.

11 Principle 3 - Ensure Symmetry

12 Asymmetrical treatment of benefits and costs associated with a resource  
13 can lead to a biased assessment of the resource. To avoid such bias,  
14 benefits and costs should be treated symmetrically for any given type of  
15 impact.

16 Principle 4 - Account for Relevant, Material Impact

17 Cost-effectiveness tests should include all relevant (according to  
18 applicable policy goals), material impacts including those that are difficult  
19 to quantify or monetize.

20 Principle 5 - Conduct Forward-Looking, Long-term, Incremental Analyses

21 Cost-effectiveness analyses should be forward-looking, long-term, and  
22 incremental to what would have occurred absent the DER. This helps

1 ensure that the resource in question is properly compared with  
2 alternatives.

3 Principle 6 - Avoid Double-Counting Impacts

4 Cost-effectiveness analyses present a risk of double-counting benefits  
5 and/or costs. All impacts should therefore be clearly defined and valued to  
6 avoid double-counting.

7 Principle 7 - Ensure Transparency

8 Transparency helps to ensure engagement and trust in the BCA process  
9 and decisions. BCA practices should therefore be transparent, where all  
10 relevant assumptions, methodologies, and results are clearly documented  
11 and available for stakeholder review and input.

12 Principle 8 - Conduct BCAs Separately from Rate Impact Analyses

13 Cost-effectiveness analyses answer fundamentally different questions  
14 from rate impact analyses, and therefore should be conducted separately  
15 from rate impact analyses.

16 **Q. Did the Company rely on the NSPM-DER guiding principles or similar guidance in**  
17 **developing its NMS II tariff proposal?**

18 A. No. The Company did not appear to rely upon any guiding principles in evaluating the  
19 costs and benefits of net metered generation or in designing its NMS II proposal.<sup>30</sup>

20 **Q. How does the Company defend its approach?**

21 A. First, the Company objected to being asked to indicate what principles, if any, it relied  
22 upon in developing its NMS II proposal and whether they aligned or differed from the

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<sup>30</sup> Company response to JI-SDR-02.

1 NSPM-DER guiding principles. Second, the Company offers language from a Kentucky  
2 Court of Appeals decision, the U.S. Supreme Court decision in *Federal Power*  
3 *Commission versus Hope Natural Gas*,<sup>31</sup> for the proposition that “it is the result reached  
4 and not the methodology employed that controls in determined the reasonableness of  
5 rates.”<sup>32</sup> The Kentucky Court of Appeals decision cited was not addressing the  
6 evidentiary foundation for a rate proposal by a utility, but rather a Commission decision  
7 to approve rates and the discretion that the Commission enjoys in choosing and  
8 considering factors influencing its decisions. The decision involved a case in which there  
9 were differences of opinion as to which factors and methods, from among several, that  
10 the Commission could consider and absolutely does not support a finding of  
11 reasonableness in rates where no meaningful methods or factors are presented for  
12 Commission evaluation. Finally, the Company invokes the logical fallacy know as  
13 circular reasoning or begging the question in asserting that its proposed NMS II rate  
14 should be found just and reasonable because the Company asserts that the proposal is just  
15 and reasonable.<sup>33</sup> In sum, the Company proposal rests on no sound guiding principles and  
16 the Commission should direct the Company to rely on those in the NSPM-DER.

17 **Q. The NSPM-DER also proposes a five-step process for developing and conducting**  
18 **BCAs for DERs. What are those steps?**

19 A. The NSPM-DER lays out the following process steps for developing and conducting a  
20 BCA:<sup>34</sup>

21 STEP 1 - Articulate Applicable Policy Goals

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<sup>31</sup> Federal Power Comm’n v. Hope Natural Gas Co., 320 U.S. 591 (1944).

<sup>32</sup> Company response to JI-SDR-02.

<sup>33</sup> *Id.*

<sup>34</sup> NSPM-DER Ch. 3.

1                   Articulate the jurisdiction’s applicable policy goals related to DERs.

2                   **STEP 2 - Include All Utility System Impacts**

3                   Identify and include the full range of utility system impacts in the primary  
4                   test, and all BCA tests.

5                   **STEP 3 - Decide Which Non-Utility System Impacts to Include**

6                   Identify those non-utility system impacts to include in the primary test  
7                   based on applicable policy goals identified in Step 1:

- 8                   • Determine whether to include host customer impacts, low-income  
9                   impacts, other fuel and water impacts, and/or societal impacts.

10                  **STEP 4 - Ensure that Benefits and Costs are Properly Addressed**

11                  Ensure that the impacts identified in Steps 2 and 3 are properly addressed,  
12                  where:

- 13                  • Benefits and costs are treated symmetrically.
- 14                  • Relevant and material impacts are included, even if hard to quantify.
- 15                  • Benefits and costs are not double counted.
- 16                  • Benefits and costs are treated consistently across DER types.

17                  **STEP 5 - Establish Comprehensive, Transparent Documentation**

18                  Establish comprehensive, transparent documentation and reporting,  
19                  whereby:

- 20                  • The process used to determine the primary test is fully documented.
- 21                  • Reporting requirements and/or use of templates for presenting  
22                  assumptions and results are developed.

1 **Q. Did the Company’s process for establishing its NMS II tariff rely upon the same or**  
2 **a similar process as that recommended in the NSPM-DER?**

3 A. No. The Company response to the request that it explain how its process aligned with or  
4 differed from the best practices guidance in the NSPM-DER was the same as its response  
5 to the query as to guiding principles.<sup>35</sup> The Commission should direct the Company to  
6 clearly and completely describe the process that it uses in developing a new proposal for  
7 any NMS II tariff and to reflect the best practices guidance in the NSPM-DER.

8 **Q. The NSPM-DER lists utility system impacts that may result for DER operations that**  
9 **should be considered in every case in order to perform a BCA in accordance with**  
10 **best practices. What are those impacts?**

11 A. The utility system impacts that the NSPM-DER recommends for evaluation in every case  
12 are:<sup>36</sup>

- 13 • Generation - Energy generation
- 14 • Generation – Capacity
- 15 • Generation - Environmental compliance
- 16 • Generation - RPS/CES compliance
- 17 • Generation - Market price effects
- 18 • Generation - Ancillary services
- 19 • Transmission - Transmission capacity
- 20 • Transmission - Transmission system losses
- 21 • Distribution - Distribution capacity

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<sup>35</sup> Company response to JI-SDR-03

<sup>36</sup> NSPM-DER Ch. 4.

- 1           • Distribution - Distribution system losses
- 2           • Distribution - Distribution operations and maintenance
- 3           • Distribution - Distribution voltage
- 4           • General - Financial incentives
- 5           • General - Program administration
- 6           • General - Utility performance incentives
- 7           • General - Credit and collection
- 8           • General – Risk
- 9           • General - Reliability
- 10          • General – Resilience

11 **Q. Did the Company evaluate and quantify or describe all of these utility system**  
12 **impacts that may result from the operation of net metered generation?**

13 A. No. The Company response to the request that it explain how its process aligned with or  
14 differed from this best-practices guidance in the NSPM-DER was the same as its  
15 response to the query as to guiding principles, and recommended process.<sup>37</sup> The  
16 Commission should direct the Company to evaluate these impacts in a BCA as part of its  
17 development of any new NMS tariff.

18 **Q. The NSPM-DER lists host customer and societal impacts that may result for DER**  
19 **operations that may be considered, according to jurisdictional policy preference, in**  
20 **order to perform a BCA in accordance with best practices. What are those impacts?**

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<sup>37</sup> Company response to JI-SDR-04.

- 1 A. The host customer and societal impacts that the NSPM-DER recommends for potential  
2 evaluation, according to jurisdictional policy preference are:<sup>38</sup>
- 3 • Host Customer - Host portion of DER costs
  - 4 • Host Customer - Host transaction costs
  - 5 • Host Customer - Interconnection fees
  - 6 • Host Customer - Risk
  - 7 • Host Customer - Reliability
  - 8 • Host Customer - Resilience
  - 9 • Host Customer - Tax incentives
  - 10 • Host Customer - Non-energy impacts
  - 11 • Host Customer - Low-income customer non-energy impacts
  - 12 • Societal - Resilience impacts beyond those experienced by utilities or host  
13 customers
  - 14 • Societal - Greenhouse gas emissions created by fossil-fueled energy resources
  - 15 • Societal - Other air emissions, solid waste, land, water, and other environmental  
16 impacts
  - 17 • Societal - Incremental economic development and job impacts
  - 18 • Societal - Health impacts, medical costs, and productivity affected by health
  - 19 • Societal - Poverty alleviation, environmental justice, and reduced home  
20 foreclosures
  - 21 • Societal - Energy imports and energy independence

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<sup>38</sup> NSPM-DER Ch. 4.

1 **Q. Did the Company evaluate and quantify or describe all of these host customer or**  
2 **societal impacts that may result from the operation of net metered generation?**

3 A. No. The Company response to the request that it explain how its process aligned with or  
4 differed from this best practices guidance in the NSPM-DER was the same as its response  
5 to the query as to guiding principles, recommended process, and utility system impacts.<sup>39</sup>  
6 The Commission should direct the Company to these impacts in a BCA as part of its  
7 development of any new NMS tariff.

## 8 **FINDINGS AND RECOMMENDATIONS**

9 **Q. Please summarize your findings regarding a BCA Framework for evaluating the**  
10 **costs and benefits that result from the installation and operation of net metered**  
11 **generation.**

12 A. A BCA Framework developed in accordance with best practices guidance, such as that  
13 contained in the NSPM-DER, is essential in order to provide a substantial and competent  
14 evidentiary foundation for the design of fair, just, and reasonable rates for customer  
15 generators. Given that the Company has not met its burden of supporting its proposed  
16 tariff with adequate evidence and the fact the Commission must conduct similar  
17 evaluations for other utilities in Kentucky, the prescribing of the elements of a BCA  
18 Framework is administratively efficient and will promote the statewide uniformity in  
19 approach that can support the emergence of a self-sustaining competitive non-utility  
20 customer generation market segment. In addition to providing cost-based analytical  
21 support for net metering compensation, such a framework can also provide broad and  
22 future benefits in supporting the development of other tariffs relating to DERs, evaluation

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<sup>39</sup> Company response to JI-SDR-05, -06.



1 of grid modernization investments including those relating to AMI, and transmission,  
2 distribution, and generation planning.

3 **Q. What specific recommendation do you have for the Commission in this proceeding?**

4 A. The Commission should deny the Company's proposal to implement its NMS II tariff.  
5 The NMS II tariff proposal is unfair, unjust, and unreasonable and it is not in the public  
6 interest that the proposal remain in effect in any way. The Commission should direct that  
7 NMS I remain in effect until the Company proposes a successor tariff that will result in  
8 fair, just, and reasonable rates, based on the development and application of a BCA  
9 Framework. The Commission should further direct the Company to develop a BCA  
10 Framework and conduct a BCA for net metered generation in accordance with the  
11 principles, process, impacts, and other guidance in the NSPM-DER. The Commission  
12 should direct the Company to report its assumptions, methods, and results in a transparent  
13 and comprehensive manner to the interested public and provide a meaningful opportunity  
14 for stakeholder comments and suggestions. The Commission should direct the Company  
15 to make the BCA Framework and tool available to the public and interested stakeholders  
16 along with any proposal for new rates relating to DER in order that such stakeholders can  
17 design and propose alternative rate approaches for consideration by the Commission.  
18 Finally, the Commission should direct the Company to adopt a schedule for updating its  
19 BCA Framework on a regular interval—such as once every two years—in order to take  
20 advantage of evolving experience and best practices in the industry in general.

21 **Q. Does that conclude your testimony?**

22 A. Yes.

EXHIBIT 1 TO SUPPLEMENTAL TESTIMONY OF KARL RABAGO  
ON BEHALF OF JOINT INTERVENORS

## **Karl R. Rábago**

### **Rábago Energy LLC**

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c/SMS: +1.512.968.7543 | e: karl@rabagoenergy.com

Nationally recognized leader and innovator in electricity and energy law, policy, and regulation. Experienced as a regulatory expert, utility executive, research and development manager, sustainability leader, senior government official, educator, and advocate. Successful track record of working with U.S. Congress, state legislatures, governors, regulators, city councils, business leaders, researchers, academia, and community groups. Nationally recognized speaker on energy, environment, and sustainable development matters. Managed staff as large as 250; responsible for operations of research facilities with staff in excess of 600. Developed and managed budgets in excess of \$300 million. Law teaching experience at Pace University Elisabeth Haub School of Law, University of Houston Law Center, and U.S. Military Academy at West Point. Military veteran.

## **Employment**

### **RÁBAGO ENERGY LLC**

Principal: July 2012—Present. Consulting practice dedicated to providing business sustainability, expert witness, and regulatory advice and services to organizations in the clean and advanced energy sectors. Prepared and submitted testimony in more than 30 states and 100 electricity and gas regulatory proceedings. Recognized national leader in development and implementation of award-winning “Value of Solar” alternative to traditional net metering. Additional information at [www.rabagoenergy.com](http://www.rabagoenergy.com).

- Chairman of the Board, Center for Resource Solutions (1997-present). CRS is a not-for-profit organization based at the Presidio in California. CRS developed and manages the Green-e Renewable Electricity Brand, a nationally and internationally recognized branding program for green power and green pricing products and programs. Past chair of the Green-e Governance Board.
- Director, Solar United Neighbors (2018-present).

### **PACE ENERGY AND CLIMATE CENTER, PACE UNIVERSITY ELISABETH HAUB SCHOOL OF LAW**

Senior Policy Advisor: September 2019—September 2020. Part-time advisor and staff member. Provide expert witness, project management, and business development support on electric and gas regulatory and policy issues and activities.

Executive Director: May 2014—August 2019. Leader of a team of professional and technical experts and law students in energy and climate law, policy, and regulation. Secured funding for and managed execution of regulatory intervention, research, market development support, and advisory services. Taught Energy Law. Provided learning and development opportunities for law students. Additional activities:

- Former Director, Alliance for Clean Energy – New York (2018-2019).
- Former Director, Interstate Renewable Energy Council (IREC) (2012-2018).
- Former Co-Director and Principal Investigator, Northeast Solar Energy Market Coalition (2015-2017). The NESEMC was a US Department of Energy’s SunShot Initiative Solar Market Pathways project. Funded under a cooperative agreement between the US DOE and Pace University, the NESEMC worked to harmonize solar market policy and advance supportive policy and regulatory practices in the northeast United States.

# **Karl R. Rábago**

## **AUSTIN ENERGY – THE CITY OF AUSTIN, TEXAS**

Vice President, Distributed Energy Services: April 2009—June 2012. Executive in 8th largest public power electric utility serving more than one million people in central Texas. Responsible for management and oversight of energy efficiency, demand response, and conservation programs; low-income weatherization; distributed solar and other renewable energy technologies; green buildings program; key accounts relationships; electric vehicle infrastructure; and market research and product development. Executive sponsor of Austin Energy’s participation in an innovative federally-funded smart grid demonstration project led by the Pecan Street Project. Led teams that successfully secured over \$39 million in federal stimulus funds for energy efficiency, smart grid, and advanced electric transportation initiatives. Additional activities included:

- Director, Renewable Energy Markets Association. REMA is a trade association dedicated to maintaining and strengthening renewable energy markets in the United States.
- Membership on Pedernales Electric Cooperative Member Advisory Board. Invited by the Board of Directors to sit on first-ever board to provide formal input and guidance on energy efficiency and renewable energy issues for the nation’s largest electric cooperative.

## **THE AES CORPORATION**

Director, Government & Regulatory Affairs: June 2006—December 2008. Director, Global Regulatory Affairs, provided regulatory support and group management to AES’s international electric utility operations on five continents. Managing Director, Standards and Practices, for Greenhouse Gas Services, LLC, a GE and AES venture committed to generating and marketing greenhouse gas credits to the U.S. voluntary market. Government and regulatory affairs manager for AES Wind Generation. Managed a portfolio of regulatory and legislative initiatives to support wind energy market development in Texas, across the United States, and in many international markets.

## **JICARILLA APACHE NATION UTILITY AUTHORITY**

Director: 1998—2008. Located in New Mexico, the JANUA was an independent utility developing profitable and autonomous utility services that provide natural gas, water utility services, low income housing, and energy planning for the Nation. Authored “First Steps” renewable energy and energy efficiency strategic plan with support from U.S. Department of Energy.

## **HOUSTON ADVANCED RESEARCH CENTER**

Group Director, Energy and Buildings Solutions: December 2003—May 2006. Leader of energy and building science staff at a mission-driven not-for-profit contract research organization based in The Woodlands, Texas. Responsible for developing, maintaining and expanding upon technology development, application, and commercialization support programmatic activities, including the Center for Fuel Cell Research and Applications; the Gulf Coast Combined Heat and Power Application Center; and the High-Performance Green Buildings Practice. Secured funding for major new initiative in carbon nanotechnology applications in the energy sector.

- President, Texas Renewable Energy Industries Association. As elected president of the statewide business association, led and managed successful efforts to secure and implement significant expansion of the state’s renewable portfolio standard as well as other policy, regulatory, and market development activities.
- Director, Southwest Biofuels Initiative. Established the Initiative as an umbrella structure for a number of biofuels related projects.

## **Karl R. Rábago**

- Member, Committee to Study the Environmental Impacts of Windpower, National Academies of Science National Research Council. The Committee was chartered by Congress and the Council on Environmental Quality to assess the impacts of wind power on the environment.
- Advisory Board Member, Environmental & Energy Law & Policy Journal, University of Houston Law Center.

### **CARGILL DOW LLC (NOW NATUREWORKS, LLC)**

Sustainability Alliances Leader: April 2002—December 2003. Integrated sustainability principles into all aspects of a ground-breaking bio-based polymer manufacturing venture. Responsible for maintaining, enhancing and building relationships with stakeholders in the worldwide sustainability community, as well as managing corporate and external sustainability initiatives.

- Successfully completed Minnesota Management Institute at University of Minnesota Carlson School of Management, an alternative to an executive MBA program that surveyed fundamentals and new developments in finance, accounting, operations management, strategic planning, and human resource management.

### **ROCKY MOUNTAIN INSTITUTE**

Managing Director/Principal: October 1999—April 2002. Co-authored “Small Is Profitable,” a comprehensive analysis of the benefits of distributed energy resources. Provided consulting and advisory services to help business and government clients achieve sustainability through application and incorporation of Natural Capitalism principles.

- President of the Board, Texas Ratepayers Organization to Save Energy. Texas R.O.S.E. is a non-profit organization advocating low-income consumer issues and energy efficiency programs.
- Co-Founder and Chair of the Advisory Board, Renewable Energy Policy Project-Center for Renewable Energy and Sustainable Technology. REPP-CREST was a national non-profit research and internet services organization.

### **CH2M HILL**

Vice President, Energy, Environment and Systems Group: July 1998—August 1999. Responsible for providing consulting services to a wide range of energy-related businesses and organizations, and for creating new business opportunities in the energy industry for an established engineering and consulting firm. Completed comprehensive electric utility restructuring studies for the states of Colorado and Alaska.

### **PLANERGY**

Vice President, New Energy Markets: January 1998—July 1998. Responsible for developing and managing new business opportunities for the energy services market. Provided consulting and advisory services to utility and energy service companies.

### **ENVIRONMENTAL DEFENSE FUND**

Energy Program Manager: March 1996—January 1998. Managed renewable energy, energy efficiency, and electric utility restructuring programs. Led regulatory intervention activities in Texas and California. In Texas, played a key role in crafting Deliberative Polling processes. Participated in national environmental and energy advocacy networks, including the Energy Advocates Network, the National Wind Coordinating Committee, the NCSL Advisory Committee on Energy, and the PV-COMPACT Coordinating Council. Frequently appeared before the Texas Legislature, Austin City Council, and regulatory commissions on electric restructuring issues.

# Karl R. Rábago

## UNITED STATES DEPARTMENT OF ENERGY

Deputy Assistant Secretary, Utility Technologies: January 1995–March 1996. Manager of the Department's programs in renewable energy technologies and systems, electric energy systems, energy efficiency, and integrated resource planning. Supervised technology research, development and deployment activities in photovoltaics, wind energy, geothermal energy, solar thermal energy, biomass energy, high-temperature superconductivity, transmission and distribution, hydrogen, and electric and magnetic fields. Managed, coordinated, and developed international agreements. Supervised development and deployment support activities at national laboratories. Developed, advocated, and managed a Congressional budget appropriation of approximately \$300 million.

## STATE OF TEXAS

Commissioner, Public Utility Commission of Texas. May 1992–December 1994. Appointed by Governor Ann W. Richards. Regulated electric and telephone utilities in Texas. Co-chair and organizer of the Texas Sustainable Energy Development Council. Vice-Chair of the National Association of Regulatory Utility Commissioners (NARUC) Committee on Energy Conservation. Member and co-creator of the Photovoltaic Collaborative Market Project to Accelerate Commercial Technology (PV-COMPACT).

## LAW TEACHING

**Professor for a Designated Service:** Pace University Elisabeth Haub School of Law, 2014-2019. Non-tenured member of faculty. Taught Energy Law. Supervised a student intern practice.

**Associate Professor of Law:** University of Houston Law Center, 1990–1992. Full time, tenure track member of faculty. Courses taught: Criminal Law, Environmental Law, Criminal Procedure, Environmental Crimes Seminar, Wildlife Protection Law.

**Assistant Professor:** United States Military Academy, West Point, New York, 1988–1990. Member of the faculty in the Department of Law. Honorably discharged in August 1990, as Major in the Regular Army. Courses taught: Constitutional Law, Military Law, and Environmental Law Seminar.

## LITIGATION

Trial Defense Attorney and Prosecutor, U.S. Army Judge Advocate General's Corps, Fort Polk, Louisiana, January 1985–July 1987. Assigned to Trial Defense Service and Office of the Staff Judge Advocate.

## NON-LEGAL MILITARY SERVICE

Armored Cavalry Officer, 2d Squadron 9<sup>th</sup> Armored Cavalry, Fort Stewart, Georgia, May 1978–August 1981. Served as Logistics Staff Officer (S-4). Managed budget, supplies, fuel, ammunition, and other support for an Armored Cavalry Squadron. Served as Support Platoon Leader for the Squadron (logistical support), and as line Platoon Leader in an Armored Cavalry Troop. Graduate of Airborne and Ranger Schools. Special training in Air Mobilization Planning and Nuclear, Biological and Chemical Warfare.

# Karl R. Rábago

## Formal Education

**LL.M., Environmental Law, Pace University School of Law, 1990:** Curriculum designed to provide breadth and depth in study of theoretical and practical aspects of environmental law. Courses included: International and Comparative Environmental Law, Conservation Law, Land Use Law, Seminar in Electric Utility Regulation, Scientific and Technical Issues Affecting Environmental Law, Environmental Regulation of Real Estate, Hazardous Wastes Law. Individual research with Hudson Riverkeeper Fund, Garrison, New York.

**LL.M., Military Law, U.S. Army Judge Advocate General's School, 1988:** Curriculum designed to prepare Judge Advocates for senior level staff service. Courses included: Administrative Law, Defensive Federal Litigation, Government Information Practices, Advanced Federal Litigation, Federal Tort Claims Act Seminar, Legal Writing and Communications, Comparative International Law.

**J.D. with Honors, University of Texas School of Law, 1984:** Attended law school under the U.S. Army Funded Legal Education Program, a fully funded scholarship awarded to 25 or fewer officers each year. Served as Editor-in-Chief (1983–84); Articles Editor (1982–83); Member (1982) of the Review of Litigation. Moot Court, Mock Trial, Board of Advocates. Summer internship at Staff Judge Advocate's offices. Prosecuted first cases prior to entering law school.

**B.B.A., Business Management, Texas A&M University, 1977:** ROTC Scholarship (3–yr). Member: Corps of Cadets, Parson's Mounted Cavalry, Wings & Sabers Scholarship Society, Rudder's Rangers, Town Hall Society, Freshman Honor Society, Alpha Phi Omega service fraternity.

# Karl R. Rábago

## Selected Publications

- “Distributed Generation Law,” contributing author, American Bar Association Environment, Energy, and Resources Section (August 2020)
- “National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources,” contributing author, National Energy Screening Project (August 2020)
- “Achieving 100% Renewables: Supply-Shaping through Curtailment,” with Richard Perez, Marc Perez, and Morgan Putnam, PV Tech Power, Vol. 19 (May 2019).
- “A Radical Idea to Get a High-Renewable Electric Grid: Build Way More Solar and Wind than Needed,” with Richard Perez, The Conversation, online at <http://bit.ly/2YjnM15> (May 29, 2019).
- “Reversing Energy System Inequity: Urgency and Opportunity During the Clean Energy Transition,” with John Howat, John Colgan, Wendy Gerlitz, and Melanie Santiago-Mosier, National Consumer Law Center, online at [www.nclc.org](http://www.nclc.org) (Feb. 26, 2019).
- “Revisiting Bonbright’s Principles of Public Utility Rates in a DER World,” with Radina Valova, The Electricity Journal, Vol. 31, Issue 8, pp. 9-13 (Oct. 2018).
- “Achieving very high PV penetration – The need for an effective electricity remuneration framework and a central role for grid operators,” Richard Perez (corresponding author), Energy Policy, Vol. 96, pp. 27-35 (2016).
- “The Net Metering Riddle,” Electricity Policy.com, April 2016.
- “The Clean Power Plan,” Power Engineering Magazine (invited editorial), Vol. 119, Issue 12 (Dec. 2, 2015)
- “The ‘Sharing Utility:’ Enabling & Rewarding Utility Performance, Service & Value in a Distributed Energy Age,” co-author, 51<sup>st</sup> State Initiative, Solar Electric Power Association (Feb. 27, 2015)
- “Rethinking the Grid: Encouraging Distributed Generation,” Building Energy Magazine, Vol. 33, No. 1 Northeast Sustainable Energy Association (Spring 2015)
- “The Value of Solar Tariff: Net Metering 2.0,” The ICER Chronicle, Ed. 1, p. 46 [International Confederation of Energy Regulators] (December 2013)
- “A Regulator’s Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation,” co-author, Interstate Renewable Energy Council (October 2013)
- “The ‘Value of Solar’ Rate: Designing an Improved Residential Solar Tariff,” Solar Industry, Vol. 6, No. 1 (Feb. 2013)
- “Jicarilla Apache Nation Utility Authority Strategic Plan for Energy Efficiency and Renewable Energy Development,” lead author & project manager, U.S. Department of Energy First Steps Toward Developing Renewable Energy and Energy Efficiency on Tribal Lands Program (2008)
- “A Review of Barriers to Biofuels Market Development in the United States,” 2 Environmental & Energy Law & Policy Journal 179 (2008)
- “A Strategy for Developing Stationary Biodiesel Generation,” Cumberland Law Review, Vol. 36, p.461 (2006)
- “Evaluating Fuel Cell Performance through Industry Collaboration,” co-author, Fuel Cell Magazine (2005)
- “Applications of Life Cycle Assessment to NatureWorks™ Polylactide (PLA) Production,” co-author, Polymer Degradation and Stability 80, 403-19 (2003)



## **Karl R. Rábago**

“An Energy Resource Investment Strategy for the City of San Francisco: Scenario Analysis of Alternative Electric Resource Options,” contributing author, Prepared for the San Francisco Public Utilities Commission, Rocky Mountain Institute (2002)

“Small Is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size,” co-author, Rocky Mountain Institute (2002)

“Socio-Economic and Legal Issues Related to an Evaluation of the Regulatory Structure of the Retail Electric Industry in the State of Colorado,” with Thomas E. Feiler, Colorado Public Utilities Commission and Colorado Electricity Advisory Panel (April 1, 1999)

“Study of Electric Utility Restructuring in Alaska,” with Thomas E. Feiler, Legislative Joint Committee on electric Restructuring and the Alaska Public Utilities Commission (April 1, 1999)

“New Markets and New Opportunities: Competition in the Electric Industry Opens the Way for Renewables and Empowers Customers,” EEBA Excellence (Journal of the Energy Efficient Building Association) (Summer 1998)

“Building a Better Future: Why Public Support for Renewable Energy Makes Sense,” Spectrum: The Journal of State Government (Spring 1998)

“The Green-e Program: An Opportunity for Customers,” with Ryan Wisner and Jan Hamrin, Electricity Journal, Vol. 11, No. 1 (January/February 1998)

“Being Virtual: Beyond Restructuring and How We Get There,” Proceedings of the First Symposium on the Virtual Utility, Kluwer Press (1997)

“Information Technology,” Public Utilities Fortnightly (March 15, 1996)

“Better Decisions with Better Information: The Promise of GIS,” with James P. Spiers, Public Utilities Fortnightly (November 1, 1993)

“The Regulatory Environment for Utility Energy Efficiency Programs,” Proceedings of the Meeting on the Efficient Use of Electric Energy, Inter-American Development Bank (May 1993)

“An Alternative Framework for Low-Income Electric Ratepayer Services,” with Danielle Jaussaud and Stephen Benenson, Proceedings of the Fourth National Conference on Integrated Resource Planning, National Association of Regulatory Utility Commissioners (September 1992)

“What Comes Out Must Go In: The Federal Non-Regulation of Cooling Water Intakes Under Section 316 of the Clean Water Act,” Harvard Environmental Law Review, Vol. 16, p. 429 (1992)

“Least Cost Electricity for Texas,” State Bar of Texas Environmental Law Journal, Vol. 22, p. 93 (1992)

“Environmental Costs of Electricity,” Pace University School of Law, Contributor–Impingement and Entrainment Impacts, Oceana Publications, Inc. (1990)

EXHIBIT 2 TO SUPPLEMENTAL TESTIMONY OF KARL RABAGO  
ON BEHALF OF JOINT INTERVENORS

## Testimony Submitted by Karl R. Rábago

(as of 11 February 2021)

Date	Proceeding	Case/Docket #	On Behalf Of:
Dec. 21, 2012	VA Electric & Power Special Solar Power Tariff	Virginia SCC Case # PUE-2012-00064	Southern Environmental Law Center
May 10, 2013	Georgia Power Company 2013 IRP	Georgia PSC Docket # 36498	Georgia Solar Energy Industries Association
Jun. 23, 2013	Louisiana Public Service Commission Re-examination of Net Metering Rules	Louisiana PSC Docket # R-31417	Gulf States Solar Energy Industries Association
Aug. 29, 2013	DTE (Detroit Edison) 2013 Renewable Energy Plan Review (Michigan)	Michigan PUC Case # U-17302	Environmental Law and Policy Center
Sep. 5, 2013	CE (Consumers Energy) 2013 Renewable Energy Plan Review (Michigan)	Michigan PUC Case # U-17301	Environmental Law and Policy Center
Sep. 27, 2013	North Carolina Utilities Commission 2012 Avoided Cost Case	North Carolina Utilities Commission Docket # E-100, Sub. 136	North Carolina Sustainable Energy Association
Oct. 18, 2013	Georgia Power Company 2013 Rate Case	Georgia PSC Docket # 36989	Georgia Solar Energy Industries Association
Nov. 4, 2013	PEPCO Rate Case (District of Columbia)	District of Columbia PSC Formal Case # 1103	Grid 2.0 Working Group & Sierra Club of Washington, D.C.
Apr. 24, 2014	Dominion Virginia Electric Power 2013 IRP	Virginia SCC Case # PUE-2013-00088	Environmental Respondents
May 7, 2014	Arizona Corporation Commission Investigation on the Value and Cost of Distributed Generation	Arizona Corporation Commission Docket # E-00000J-14-0023	Rábago Energy LLC (invited presentation and workshop participation)
Jul. 10, 2014	North Carolina Utilities Commission 2014 Avoided Cost Case	North Carolina Utilities Commission Docket # E-100, Sub. 140	Southern Alliance for Clean Energy
Jul. 23, 2014	Florida Energy Efficiency and Conservation Act, Goal Setting – FPL, Duke, TECO, Gulf	Florida PSC Docket # 130199-EI, 130200-EI, 130201-EI, 130202-EI	Southern Alliance for Clean Energy
Sep. 19, 2014	Ameren Missouri's Application for Authorization to Suspend Payment of Solar Rebates	Missouri PSC File No. ET-2014-0350, Tariff # YE-2014-0494	Missouri Solar Energy Industries Association
Aug. 6, 2014	Appalachian Power Company 2014 Biennial Rate Review	Virginia SCC Case # PUE-2014-00026	Southern Environmental Law Center (Environmental Respondents)

## Testimony Submitted by Karl R. Rábago

(as of 11 February 2021)

Aug. 13, 2014	Wisconsin Public Service Corp. 2014 Rate Application	Wisconsin PSC Docket # 6690-UR-123	RENEW Wisconsin and Environmental Law & Policy Center
Aug. 28, 2014	WE Energies 2014 Rate Application	Wisconsin PSC Docket # 05-UR-107	RENEW Wisconsin and Environmental Law & Policy Center
Sep. 18, 2014	Madison Gas & Electric Company 2014 Rate Application	Wisconsin PSC Docket # 3720-UR-120	RENEW Wisconsin and Environmental Law & Policy Center
Sep. 29, 2014	SOLAR, LLC v. Missouri Public Service Commission	Missouri District Court Case # 14AC-CC00316	SOLAR, LLC
Jan. 28, 2016 (date of CPUC order)	Order Instituting Rulemaking to Develop a Successor to Existing Net Energy Metering Tariffs, etc.	California PUC Rulemaking 14-07-002	The Utility Reform Network (TURN)
Mar. 20, 2015	Orange and Rockland Utilities 2015 Rate Application	New York PSC Case # 14-E-0493	Pace Energy and Climate Center
May 22, 2015	DTE Electric Company Rate Application	Michigan PSC Case # U-17767	Michigan Environmental Council, NRDC, Sierra Club, and ELPC
Jul. 20, 2015	Hawaiian Electric Company and NextEra Application for Change of Control	Hawai'i PUC Docket # 2015-0022	Hawai'i Department of Business, Economic Development, and Tourism
Sep. 2, 2015	Wisc. PSCo Rate Application	Wisconsin PSC Case # 6690-UR-124	ELPC
Sep. 15, 2015	Dominion Virginia Electric Power 2015 IRP	Virginia SCC Case # PUE-2015-00035	Environmental Respondents
Sep. 16, 2015	NYSEG & RGE Rate Cases	New York PSC Cases 15-E-0283, -0285	Pace Energy and Climate Center
Oct. 14, 2015	Florida Power & Light Application for CCPN for Lake Okeechobee Plant	Florida PSC Case 150196-EI	Environmental Confederation of Southwest Florida
Oct. 27, 2015	Appalachian Power Company 2015 IRP	Virginia SCC Case # PUE-2015-00036	Environmental Respondents
Nov. 23, 2015	Narragansett Electric Power/National Grid Rate Design Application	Rhode Island PUC Docket No. 4568	Wind Energy Development, LLC
Dec. 8, 2015	State of West Virginia, et al., v. U.S. EPA, et al.	U.S. Court of Appeals for the District of Columbia Circuit Case No. 15-1363 and Consolidated Cases	Declaration in Support of Environmental and Public Health Intervenor in Support of Movant Respondent-Intervenor's Responses in Opposition to Motions for Stay

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(as of 11 February 2021)

Dec. 28, 2015	Ohio Power/AEP Affiliate PPA Application	PUC of Ohio Case No. 14-1693-EL-RDR	Environmental Law and Policy Center
Jan. 19, 2016	Ohio Edison Company, Cleveland Electric Illuminating Company, and Toledo Edison Company Application for Electric Security Plan (FirstEnergy Affiliate PPA)	PUC of Ohio Case No. 14-1297-EL-SSO	Environmental Law and Policy Center
Jan. 22, 2016	Northern Indiana Public Service Company (NIPSCO) Rate Case	Indiana Utility Regulatory Commission Cause No. 44688	Citizens Action Coalition and Environmental Law and Policy Center
Mar. 18, 2016	Northern Indiana Public Service Company (NIPSCO) Rate Case – Settlement Testimony	Indiana Utility Regulatory Commission Cause No. 44688	Joint Intervenors – Citizens Action Coalition and Environmental Law and Policy Center
Mar. 18, 2016	Comments on Pilot Rate Proposals by MidAmerican and Alliant	Iowa Utility Board NOI-2014-0001	Environmental Law and Policy Center
May 27, 2016	Consolidated Edison of New York Rate Case	New York PSC Case No. 16-E-0060	Pace Energy and Climate Center
June 21, 2016	Federal Trade Commission: Workshop on Competition and Consumer Protection Issues in Solar Energy	Invited workshop presentation	Pace Energy and Climate Center
Aug. 17, 2016	Dominion Virginia Electric Power 2016 IRP	Virginia SCC Case # PUE-2016-00049	Environmental Respondents
Sep. 13, 2016	Appalachian Power Company 2016 IRP	Virginia SCC Case # PUE-2016-00050	Environmental Respondents
Oct. 27, 2016	Consumers Energy PURPA Compliance Filing	Michigan PSC Case No. U-18090	Environmental Law & Policy Center, “Joint Intervenors”
Oct. 28, 2016	Delmarva, PEPCO (PHI) Utility Transformation Filing – Review of Filing & Utilities of the Future Whitepaper	Maryland PSC Case PC 44	Public Interest Advocates
Dec. 1, 2016	DTE Electric Company PURPA Compliance Filing	Michigan PSC Case No. U-18091	Environmental Law & Policy Center, “Joint Intervenors”
Dec. 16, 2016	Rebuttal of Unitil Testimony in Net Energy Metering Docket	New Hampshire Docket No. DE 16-576	New Hampshire Sustainable Energy Association (“NHSEA”)
Jan. 13, 2017	Gulf Power Company Rate Case	Florida Docket No. 160186-EI	Earthjustice, Southern Alliance for Clean Energy, League of Women Voters-Florida

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Jan. 13, 2017	Alpena Power Company PURPA Compliance Filing	Michigan PSC Case No. U-18089	Environmental Law & Policy Center, "Joint Intervenors"
Jan. 13, 2017	Indiana Michigan Power Company PURPA Compliance Filing	Michigan PSC Case No. U-18092	Environmental Law & Policy Center, "Joint Intervenors"
Jan. 13, 2017	Northern States Power Company PURPA Compliance Filing	Michigan PSC Case No. U-18093	Environmental Law & Policy Center, "Joint Intervenors"
Jan. 13, 2017	Upper Peninsula Power Company PURPA Compliance Filing	Michigan PSC Case No. U-18094	Environmental Law & Policy Center, "Joint Intervenors"
Mar. 10, 2017	Eversource Energy Grid Modernization Plan	Massachusetts DPU Case No. 15-122/15-123	Cape Light Compact
Apr. 27, 2017	Eversource Rate Case & Grid Modernization Investments	Massachusetts DPU Case No. 17-05	Cape Light Compact
May 2, 2017	AEP Ohio Power Electric Security Plan	PUC of Ohio Case No. 16-1852-EL-SSO	Environmental Law & Policy Center
Jun. 2, 2017	Vectren Energy TDSIC Plan	Indiana URC Cause No. 44910	Citizens Action Coalition & Valley Watch
Jul. 28, 2017	Vectren Energy 2016-2017 Energy Efficiency Plan	Indiana URC Cause No. 44645	Citizens Action Coalition
Jul. 28, 2017	Vectren Energy 2018-2020 Energy Efficiency Plan	Indiana URC Cause No. 44927	Citizens Action Coalition
Aug. 1, 2017	Interstate Power & Light (Alliant) 2017 Rate Application	Iowa Utilities Board Docket No. RPU-2017-0001	Environmental Law & Policy Center, Iowa Environmental Council, Natural Resources Defense Council, and Solar Energy Industries Assoc.
Aug. 11, 2017	Dominion Virginia Electric Power 2017 IRP	Virginia SCC Case # PUR-2017-00051	Environmental Respondents
Aug. 18, 2017	Appalachian Power Company 2017 IRP	Virginia SCC Case # PUR-2017-00045	Environmental Respondents
Aug. 23, 2017	Pennsylvania Solar Future Project	PA Dept. of Environmental Protection - Alternative Ratemaking Webinar	Pace Energy and Climate Center
Aug. 25, 2017	Niagara Mohawk Power Co. d/b/a National Grid Rate Case	New York PSC Case # 17-E-0238, 17-G-0239	Pace Energy and Climate Center

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Sep. 15, 2017	Niagara Mohawk Power Co. d/b/a National Grid Rate Case	New York PSC Case # 17-E-0238, 17-G-0239	Pace Energy and Climate Center
Oct. 20, 2017	Missouri PSC Working Case to Explore Emerging Issues in Utility Regulation	Missouri PSC File No. EW-2017-0245	Renew Missouri
Nov. 21, 2017	Central Hudson Gas & Electric Co. Electric and Gas Rates Cases	New York PSC Case # 17-E-0459, -0460	Pace Energy and Climate Center
Jan. 16, 2018	Great Plains Energy, Inc. Merger with Westar Energy, Inc.	Missouri PSC Case # EM-2018-0012	Renew Missouri Advocates
Jan. 19, 2018	U.S. House of Representatives, Energy and Commerce Committee	Hearing on "The PURPA Modernization Act of 2017," H.R. 4476	Rábago Energy LLC
Jan. 29, 2018	Joint Petition of Electric Distribution Companies for Approval of a Model SMART Tariff	Massachusetts D.P.U. Case No. 17-140	Boston Community Capital Solar Energy Advantage Inc.  (Jointly authored with Sheryl Musgrove)
Feb. 21, 2018	Joint Petition of Electric Distribution Companies for Approval of a Model SMART Tariff	Massachusetts D.P.U. Case No. 17-140 - Surrebuttal	Boston Community Capital Solar Energy Advantage Inc.  (Jointly authored with Sheryl Musgrove)
Apr. 6, 2018	Narragansett Electric Co., d/b/a National Grid Rate Case Filing	RI PUC Docket No. 4770	New Energy Rhode Island ("NERI")
Apr. 25, 2018	Narragansett Electric Co., d/b/a National Grid Power Sector Transformation Plan	Rhode Island PUC Docket No. 4780	New Energy Rhode Island ("NERI")
Apr. 26, 2018	U.S. EPA Proposed Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035 (Oct. 16, 2017) – "Clean Power Plan"	U.S. EPA Docket No. EPA-HQ-OAR-2016-0592	Karl R. Rábago
May 25, 2018	Orange & Rockland Utilities, Inc. Rate Case Filing	New York PSC Case Nos. 18-E-0067, 18-G-0068	Pace Energy and Climate Center
Jun. 15, 2018	Orange & Rockland Utilities, Inc. Rate Case Filing	New York PSC Case Nos. 18-E-0067, 18-G-0068 – Rebuttal Testimony	Pace Energy and Climate Center
Aug. 10, 2018	Dominion Virginia Electric Power 2018 IRP	Virginia SCC Case # PUR-2018-00065	Environmental Respondents

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(as of 11 February 2021)

Sep. 20, 2018	Consumers Energy Company Rate Case	Michigan PSC Case No. U-20134	Environmental Law & Policy Center
Sep. 27, 2018	Potomac Electric Power Co. Notice to Construct Two 230 kV Underground Circuits	District of Columbia Public Service Commission Formal Case No. 1144	Solar United Neighbors of D.C.
Sep. 28, 2019	Arkansas Public Service Commission Investigation of Policies Related to Distributed Energy Resources	Arkansas PSC Docket No. 16-028-U	Arkansas Audubon Society & Arkansas Advanced Energy Association
Nov. 7, 2018	DTE Detroit Edison Rate Case	Michigan PSC Case No. U-20162	Natural Resources Defense Council, Michigan Environmental Council, Sierra Club
Mar. 26, 2019	Guam Power Authority Petition to Modify Net Metering	Guam PUC Docket GPA 19-04	Micronesia Renewable Energy, Inc.
Apr. 4, 2019	Community Power Network & League of Women Voters of Florida v. JEA	Circuit Court Duval County of Florida Case No. 2018-CA-002497 Div: CV-D	Earthjustice
Apr. 16, 2019	Dominion Virginia Electric Power 2018 IRP – Compliance Filing	Virginia SCC Case # PUR-2018-00065	Environmental Respondents
Apr. 25, 2019	Georgia Power 2019 IRP	Georgia PSC Docket No. 42310	GSEA & GSEIA
May 10, 2019	NV Energy NV GreenEnergy 2.0 Rider	Nevada PUC Docket Nos. 18-11015, 18-11016	Vote Solar
May 24, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Misc. Issues	New York PSC Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
May 24, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Low- and Moderate-Income Panel	New York PSC Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
May 30, 2019	Connecticut DEEP Shared Clean Energy Facility Program Proposal	Connecticut Department of Energy and Environmental Protection Docket No. 19-07-01	Connecticut Fund for the Environment
Jun. 3, 2019	New Orleans City Council Rulemaking to Establish Renewable Portfolio Standards	New Orleans City Council Docket No. UD-19-01	National Audubon Society and Audubon Louisiana
Jun. 14, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Rebuttal Testimony	New York PSC Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center



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(as of 11 February 2021)

Jun. 24, 2019	Program to Encourage Clean Energy in Westchester County Pursuant to Public Service law Section 74-a; Staff Investigation into a Moratorium on New Natural Gas Services in the Consolidated Edison Company of New York, Inc. Service Territory	New York PSC Case Nos. 19-M-0265, 19-G-0080	Earthjustice and Pace Energy and Climate Center
Jul. 12, 2019	Application of Virginia Electric and Power Company for the Determination of the Fair Rate of Return on Common Equity	Virginia SCC Case # PUR-2019-00050	Virginia Poverty Law Center
Jul. 15, 2019	New Orleans City Council Rulemaking to Establish Renewable Portfolio Standards – Reply Comments	New Orleans City Council Docket No. UD-19-01	National Audubon Society and Audubon Louisiana
Aug. 1, 2019	Interstate Power and Light Company – General Rate Case	Iowa Utilities Board Docket No. RPU-2019-0001	Environmental Law & Policy Center and Iowa Environmental Council
Aug. 19, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Surrebuttal	New York PSC Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
Aug. 21, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources - Comments	Connecticut DEEP/PURA Docket No. 19-06-29	Connecticut Fund for the Environment and Save Our Sound
Sep. 10, 2019	Interstate Power and Light Company – General Rate Case - Rebuttal	Iowa Utilities Board Docket No. RPU-2019-0001	Environmental Law & Policy Center and Iowa Environmental Council
Sep. 18, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources – Comments and Response to Draft Study Outline	Connecticut DEEP/PURA Docket No. 19-06-29	Connecticut Fund for the Environment, Save Our Sound, E4theFuture, NE Clean Energy Council, NE Energy Efficiency Partnership, and Acadia Center
Sep. 20, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources – Participation in Technical Workshop 1	Connecticut DEEP/PURA Docket No. 19-06-29 <a href="http://www.ctn.state.ct.us/ctnplayer.asp?odID=16715">http://www.ctn.state.ct.us/ctnplayer.asp?odID=16715</a>	Connecticut Fund for the Environment and Save Our Sound

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**(as of 11 February 2021)**

Oct. 4, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources – Participation in Technical Workshop 2	Connecticut DEEP/PURA Docket No. 19-06-29 <a href="http://www.ctn.state.ct.us/ctnplayer.asp?odID=16766">http://www.ctn.state.ct.us/ctnplayer.asp?odID=16766</a>	Connecticut Fund for the Environment and Save Our Sound
Oct. 15, 2019	Electronic Consideration of the Implementation of the Net Metering Act (KY SB 100)	Kentucky Public Service Commission Case No. 2019-00256	Kentuckians for the Commonwealth & Mountain Association for Community Economic Development
Oct. 15, 2019	New Orleans City Council Rulemaking to Establish Renewable Portfolio Standards – Comments on City Council Utility Advisors’ Report	New Orleans City Council Docket No. UD-19-01	National Audubon Society and Audubon Louisiana, Vote Solar, 350 New Orleans, Alliance for Clean Energy, PosiGen, and Sierra Club
Oct. 17, 2019	Indiana Michigan Power Co. General Rate Case	Michigan Public Service Company Case No. U-20359	Environmental Law & Policy Center, The Ecology Center, the Solar Energy Industries Association, and Vote Solar
Dec. 4, 2019	Alabama Power Company Petition for Certificate of Convenience and Necessity	Alabama Public Service Commission Docket No. 32953	Energy Alabama and Gasp, Inc.
Dec. 5, 2019	In the Matter of Net Metering and the Implementation of Act 827 of 2015	Arkansas Public Service Commission Docket No. 16-027-R	National Audubon Society and Arkansas Advanced Energy Association
Dec. 6, 2019	Proposed Revisions to Vermont Public Utility Commission Rule 5.100	Vermont Public Utility Commission Case No. 19-0855-RULE	Renewable Energy Vermont (“REV”)
Jan. 15, 2020	General Rate Case	Washington Utilities and Transportation Commission Docket Nos. UE-190529 & UG-190530	Puget Sound Energy
Feb. 11, 2020	Application of Entergy Arkansas, LLC for a Proposed Tariff Amendment: Solar Energy Purchase Option – Direct Testimony	Arkansas Public Service Commission Docket No. 19-042-TF	Arkansas Advanced Energy Association
Mar. 17, 2020	Application of Entergy Arkansas, LLC for a Proposed Tariff Amendment: Solar Energy Purchase Option – Surrebuttal Testimony	Arkansas Public Service Commission Docket No. 19-042-TF	Arkansas Advanced Energy Association

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(as of 11 February 2021)

Jun. 16, 2020	PECO Energy Default Supply Plan V – Direct Testimony	Pennsylvania Public Utility Commission Docket No. P-2020-3019290	Environmental Respondents / Earthjustice
Jun. 24, 2020	Consumers Energy Company General Rate Case – Direct Testimony	Michigan Public Service Commission Case No. U-20697	Joint Clean Energy Organizations / Environmental Law & Policy Center
Jul. 14, 2020	Consumers Energy Company General Rate Case – Rebuttal Testimony	Michigan Public Service Commission Case No. U-20697	Joint Clean Energy Organizations / Environmental Law & Policy Center
July 23, 2020	PECO Energy Default Supply Plan V – Surrebuttal Testimony	Pennsylvania Public Utility Commission Docket No. P-2020-3019290	Environmental Respondents / Earthjustice
Sept. 15, 2020	Dominion Virginia Electric Power 2020 IRP – Direct Testimony	Virginia SCC Case # PUR-2020-00035	Environmental Respondents
Sept. 18, 2020	Avoided Cost Proceeding for Georgia Power – Direct Testimony	Georgia Public Service Commission Docket No. 4822	Georgia Solar Energy Industries Association, Inc.
Sept. 29, 2020	Madison Gas and Electric – General Rate Case – Affidavit in Opposition to Electric Rates Settlement	Wisconsin Public Service Commission Docket No. 3270-UR-123	Sierra Club
Sept. 30, 2020	Madison Gas and Electric – General Rate Case – Gas Rates	Wisconsin Public Service Commission Docket No. 3270-UR-123	Sierra Club
Oct. 2, 2020	Duke Energy Florida Petition for Approval of Clean Energy Connect Program	Florida Public Service Commission Docket No. 20200176-EI	League of United Latin American Citizens of Florida
Oct. 2, 2020	Ameren Illinois – Investigation re: Calculation of Distributed Generation Rebates	Illinois Commerce Commission Docket No. 20-0389	Joint Solar Parties
Dec. 9, 2020	Arkansas – In the Matter of a Rulemaking to Adopt an Evaluation, Measurement, and Verification Protocol and Propose M&V Amendments to the Commission’s Rules for Conservation and Energy Efficiency Programs; In the Matter of the Continuation, Expansion, and Enhancement of Public Utility Energy Efficiency Programs in Arkansas	Arkansas Public Service Commission Docket Nos. 10-100-R, 13-002-U	Arkansas Advanced Energy Association

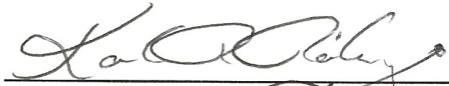
**Testimony Submitted by Karl R. Rábago**

**(as of 11 February 2021)**

Dec. 22, 2020	Appalachian Power Company 2020 Virginia Clean Economy Act Compliance Plan	Virginia SCC Case No. PUR- 2020-00135	Environmental Respondent
Jan. 4, 2021	Dominion Virginia Electric Power Company Clean Economy Compliance Plan	Virginia SCC Case No. PUR- 2020-00134	Environmental Respondents
Feb. 5, 2021	Ameren Illinois – Investigation re: Calculation of Distributed Generation Rebates - Rebuttal	Illinois Commerce Commission Docket No. 20- 0389	Joint Solar Parties

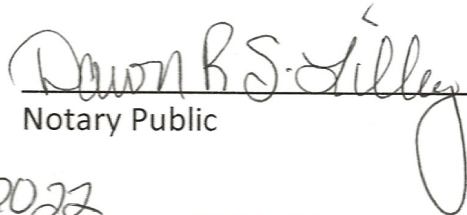
VERIFICATION

The undersigned, Karl R. Rábago, being first duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony and that the information contained therein is true and correct to the best of his information, knowledge, and belief, after reasonable inquiry.

  
Karl R. Rábago

Subscribed and sworn to before me by Karl R. Rábago this 25<sup>th</sup> day of February, 2021.

Subscribed and sworn before me, this 25<sup>th</sup> day of February, 2021, a Notary Public of and for Denver County, State of Colorado

  
Notary Public

My commission expires: 09/18/2022

DAWN RENEE SCHREINER-LILLEY  
Notary Public  
State of Colorado  
Notary ID # 20184036810  
My Commission Expires 09-18-2022

## Certificate of Service

This is to certify that the electronic version of the foregoing Supplemental Testimony of Karl Rabago is a true and accurate copy of the same document that will be filed in paper medium; that the electronic filing has been transmitted to the Commission on February 25, 2021; that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding; and that in accordance with the March 16, 2020 Commission Order in Case No. 2020-00085 an original and ten copies in paper medium of this filing will not be mailed until after the lifting of the current state of emergency.

A handwritten signature in black ink, appearing to read 'Tom FitzGerald', with a long horizontal stroke extending to the right.

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Tom FitzGerald