

**BEFORE**  
**THE PUBLIC UTILITIES COMMISSION OF OHIO**

**IN THE MATTER OF THE 2018 LONG-  
TERM FORECAST REPORT ON BEHALF  
OF OHIO POWER COMPANY AND  
RELATED MATTERS**

**Case No. 18-501-EL-FOR**

**IN THE MATTER OF THE  
APPLICATION SEEKING APPROVAL OF  
OHIO POWER COMPANY'S PROPOSAL  
TO ENTER INTO RENEWABLE ENERGY  
PURCHASE AGREEMENTS FOR  
INCLUSION IN THE RENEWABLE  
GENERATION RIDER**

**Case No. 18-1392-EL-RDR**

**IN THE MATTER OF THE APPLICATION  
OF OHIO POWER COMPANY TO AMEND  
ITS TARIFFS**

**Case No. 18-1393-EL-ATA**

**Testimony of**  
**Gabrielle Stebbins**  
**Energy Futures Group**

**On Behalf of Natural Resources Defense Council**

**January 2, 2019**

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## **List of Attachments**

Attachment GS-1

Gabrielle Stebbins Resume

Attachment GS-2

AEP's Response to NRDC-INT-1-6

**I. INTRODUCTION AND QUALIFICATIONS.**

**Q. Please state your name, title and employer.**

A. My name is Gabrielle Stebbins. I am a Senior Consultant at Energy Futures Group, located at 10298 Route 116, Hinesburg, Vermont, 05461.

**Q. Please describe Energy Futures Group.**

A. Energy Futures Group (EFG) is a clean energy consulting firm established in 2010. EFG specializes in the design, implementation, and evaluation of energy efficiency and renewable energy programs and policies. EFG has worked on behalf of utilities and other program administrators, government and regulatory agencies, and environmental, low income, and affordable housing advocacy organizations in 40 states and Canadian provinces, as well as several countries in Europe. EFG's recent work has included analysis of the impact of bidding of efficiency resources into the New England and PJM capacity markets; analyzing past and supporting current pilot projects (in Michigan and Ohio) to assess the potential for geotargeted use of distributed energy resources – “non-wires alternatives” – to cost-effectively defer capital investment in Transmission and Distribution infrastructure; assessing the potential for and impacts of electrification of space heating, water heating and transportation; assessing the role of financing products in advancing investment in clean energy; and helping develop and/or critique energy efficiency program portfolios in dozens of states, including Ohio.

**Q. Please summarize your professional and educational experience.**

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1     A.     As a Senior Consultant at Energy Futures Group (EFG), I have specialized in renewable  
2           energy policies, programs and technology, as well as the integration of renewables and  
3           other distributed resources with energy efficiency. Since joining EFG in 2016, I have led  
4           or supported a variety of projects. Examples include providing input to the Michigan  
5           Public Service Commission on renewable energy scenarios and assumptions for the  
6           state's integrated resource planning process; authoring a report for the Vermont Clean  
7           Energy Development Fund on both the importance and limitations of financing products  
8           in advancing investment in distributed renewables and efficiency; helping design and  
9           manage pilot programs in Vermont, New York and Massachusetts to test strategies for  
10          simultaneous promotion, installation and operation of photovoltaics, thermal envelope  
11          efficiency improvements, and space heat electrification in the residential sector; helping  
12          develop a 10-year forecast of potential for electrification of residential space heating,  
13          water heating and transportation for a New England utility; and reviewing utility  
14          efficiency program portfolios in Maryland and Ohio.

15          Before joining EFG I served as Executive Director of Renewable Energy Vermont  
16          (REV), the state trade association representing hundreds of solar, wind, hydro,  
17          geothermal and bioenergy businesses. Among my responsibilities was leading REV's  
18          policy work in the legislative and regulatory arenas, including significant engagement on  
19          a range of proposals and issues related to net-metering, feed-in-tariffs and renewable  
20          portfolio standards. Prior to my role at REV, I managed and developed a variety of  
21          incentive programs and community energy pilots such as the Vermont Renewable Energy

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1 Incentive Program, the Efficiency Vermont Biomass Incentive, and the Community  
2 Energy Mobilization Program.

3 I also currently serve as Chair of the Board of the Burlington Electric Department (BED),  
4 Vermont's largest municipal utility. In that role I help direct strategic planning and  
5 budgeting, including the development of an all renewables Integrated Resource Plan and  
6 the adoption of BED's Net Zero goal for all sectors (with the exclusion of air  
7 transportation) by 2030. BED led the City of Burlington, Vermont to be the first city in  
8 the United States to meet 100% of electricity needs with renewable energy. This was  
9 achieved while maintaining safe and reliable power and *without* a rate increase; BED has  
10 not increased its rates in ten years. As of December, 2018, I also serve on the legislative  
11 committee of the American Public Power Association.

12 I received a M.A. in Development Studies from the Nelson Mandela Metropolitan  
13 University, Republic of South Africa, and both a B.A. in Anthropology and a B.M. in  
14 Violin Performance from Rice University.

15 My resume, attached as Attachment GS-1, presents a summary of my professional and  
16 educational experience.

17 **Q. On whose behalf are you testifying in this case?**

18 A. I am testifying on behalf of Natural Resources Defense Council ("NRDC").

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

20 A. The purpose of my testimony is to provide information to the Public Utilities  
21 Commission of Ohio ("Commission" or "PUCO") as it considers the merits of the

1 proposals by the Ohio Power Company (“the Company” or “AEP”) in defining their need  
2 for 900 megawatts (MWs) of renewable energy, entering into contracts for 400 MWs of  
3 solar energy, developing a Green Power Tariff (Green Tariff) for customers seeking to  
4 purchase renewable energy credits, and in recovering the costs of the contract payments  
5 through a non-bypassable customer charge. Specifically, I address the cost-effectiveness  
6 of the proposed solar projects, the likelihood of this level of in-state renewable  
7 development absent approval of these applications, the value of the Company’s proposals  
8 in meeting the needs of its customers and in fulfilling its existing regulatory obligations,  
9 and the ways in which these filings and proposed projects advance state energy policy.

10 **Q: Have you previously testified in a regulatory proceeding before the PUCO?**

11 A: No.

12 **Q. Have you previously filed testimony in a regulatory proceeding in other states?**

13 A. Yes. I have filed and defended testimony before the Vermont Public Service Board (now  
14 the Public Utility Commission) on behalf of REV in a case that assessed the price to be  
15 paid by all utilities into Vermont’s feed-in-tariff program, the “Standard Offer.”

16 **II. SUMMARY OF CONCLUSIONS**

17 **Q. Please summarize your primary conclusions.**

18 A. My primary conclusions regarding the Company’s proposal to develop at least 900 MWs  
19 of renewable energy in Ohio, including 400 MWs of solar, are summarized as follows:

- 1        1. The company's assessment of the economic viability of its proposed contracts for 400  
2        MWs of grid-connected photovoltaics in Highland County, though positive, is  
3        significantly understated because of conservative assumptions and the complete omission  
4        of the value of key economic benefits to customers;
- 5        2. The development of 900 MWs of renewables in Ohio would significantly increase the  
6        amount of in-state solar and wind;
- 7        3. Absent PUCO approval of the development of these projects, it is unlikely that many – if  
8        any - in-state renewable energy projects of this size will occur;
- 9        4. The Company's customers strongly support increases in Ohio-based renewable power;
- 10       5. AEP's proposals are consistent with and will support fulfillment of AEP's obligations  
11       under 14-1693-EL-RDR;
- 12       6. The Company's proposals are consistent with state policy.

**III. THE COMPANY'S PROPOSALS**

**Q. What does the Company propose in its filings?**

A. In 18-501-EL-FOR, the Company proposes a demonstration of need for at least 900 MWs of renewable energy projects in Ohio. In 18-1392-EL-RDR and 18-1393-EL-ATA, the Company proposes (1) the inclusion of two solar energy resources totaling 400 MWs of nameplate capacity solar energy in the Company's Renewable Generation Rider (RGR); (2) the creation of a new Green Tariff; and (3) all other relief the Commission deems appropriate to facilitate the approval of its Application.



1           **IV. ECONOMIC VIABILITY OF THE COMPANY'S PROPOSALS**

2   **Q. Please summarize your understanding of the Company's economic analysis of its**  
3   **proposed contracts for 400 MWs of solar power.**

4   A. As Mr. Torpey states in his testimony, the Company's economic analysis compares the  
5   cost of the solar power contracts to forecasts of the costs of energy and capacity that  
6   customers would otherwise pay for the same amount of electricity produced from other  
7   sources over the twenty-year, renewable energy power agreement (REPA) period.<sup>1</sup> The  
8   Company concludes that solar contracts would reduce customers costs by \$99.6 million  
9   under its Base Case forecast of natural gas prices. Even in the case where lower  
10   forecasted natural gas prices are used, the projects still provide net benefits of \$41  
11   million; under higher natural gas prices, the net benefits rise to \$133 million.<sup>2</sup> These are  
12   net benefits – i.e. cost savings – that accrue to all of the Company's customers.

13 **Q. Do you consider these estimates of net benefits to customers to be conservative?**

14 A. Yes, for the following four reasons:

- 15       • The Company uses a low estimate for the capacity credit that the projects would earn;

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<sup>1</sup> Torpey testimony in Case No. 18-1392-EL-RDR and Case No. 18-1393-EL-ATA, pp. 4-7.

<sup>2</sup> These values are expressed in net present value (or NPV) terms. In nominal dollars – i.e. when not adjusting for the time value of money – the net benefits range from \$196 to \$404 million.

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- 1           • The Company acknowledges that the REPAs would provide a hedge against potential  
2           volatility in future market prices, but does not include that risk-mitigating benefit in  
3           its economic analysis;
- 4           • Though the Company concluded in its Amended 2018 Long-Term Forecast Report  
5           (Amended LTFR) that investment in 650 MWs of renewables would reduce market  
6           clearing prices for energy, resulting in savings on the order of \$6 to \$9 million per  
7           year, it had not included any such benefits in its economic analysis of the specific  
8           REPAs for the 400 MWs of solar currently under consideration. While the price  
9           suppression savings would likely be less than the savings identified in the Amended  
10          LTFR (because the current proposal is for 400 MWs of renewables and not 650  
11          MWs) it is reasonable to conclude that the savings would not be trivial.
- 12          • The Company states that revenue from customers participating in the Green Tariff  
13          will lower the net cost and increase the revenue offset flowing through the RGR. If all  
14          of the renewable attributes from the 400 MWs of solar were purchased by customers  
15          in Year 1, the Company estimates this would result in just under \$7 million in just  
16          that one year (i.e. in just the first year of a 20-year project).<sup>3</sup> However, the Company  
17          does not include any of this potential revenue in their economic analysis.

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<sup>3</sup> AEP response to NRDC Discovery Request 1.6, provided as Attachment GS-2.

1   **Q:   Please explain your statement that the Company used a low estimate of the capacity**  
2       **value of the solar projects.**

3   A:   The Company acknowledges that their approach to estimating the solar capacity of the  
4       projects is “conservative” in the testimony of Mr. John Torpey.<sup>4</sup> Specifically, the  
5       Company’s savings calculations assume a 19% capacity credit based off of the nameplate  
6       ratings of the solar REPA sites.<sup>5</sup> <sup>6</sup>Meanwhile, on June 1, 2017, PJM published class-  
7       average capacity values of 60% for solar ground mounted tracking and 38% for solar  
8       with “other than ground mounted” tracking. If the Company had modeled PJM’s  
9       published value rather than the conservative value of 19%, the result would be an  
10      additional \$73 million in net present value of savings.<sup>7</sup>

11   **Q.   Does the Company explain why 19% was chosen for the capacity value of the**  
12       **projects?**

13   A.   The Company has chosen this value to reduce the risk of a capacity performance penalty  
14       from PJM. As testified to by Mr. Allen: “The Company cannot control production of the  
15       solar facility in the same manner as a fossil generation plant and, therefore, cannot  
16       control whether the solar facility is operating when the peak load occurs throughout the  
17       PJM system.”<sup>8</sup>

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<sup>4</sup> Direct Testimony of John F. Torpey, p. 6, line 22 and p. 7, line 9. 18-1392-EL-RDR and 18-1393-EL-ATA.

<sup>5</sup> Torpey, p. 6, line 12. 18-1392-EL-RDR and 18-1393-EL-ATA.

<sup>6</sup> In this testimony, I am referring to the capacity factor value chosen for a given hour during peak demand; I am not referring to the annual capacity factor.

<sup>7</sup> Torpey, p. 7, lines 2-6. 18-1392-EL-RDR and 18-1393-EL-ATA.

<sup>8</sup> Direct Testimony of William A. Allen, page 11, lines 15 – 17. 18-1392-EL-RDR and 18-1393-EL-ATA.

1   **Q.    Do you disagree with this approach?**

2    A.    I disagree with the degree of conservatism. There are two different risks associated with  
3           the level of capacity that is bid into the market: (1) the risk of under-performing, with  
4           resulting performance penalties; and (2) the risk of under-bidding actual performance,  
5           with the result being both foregone capacity market revenues and potentially increasing  
6           the market clearing price for all capacity payments customers will have to make. Any  
7           decision on the level of capacity to bid into the market should be based on an assessment  
8           of the risk-reward trade-offs between these two factors. AEP has not presented such  
9           analysis. Instead, it seems to have focused principally on the risk of penalties for under-  
10          performance, without adequate consideration of the potential foregone benefits of  
11          performance closer to PJM's default value.

12          It is important to note that for the last thirty-seven years, PJM's summer peak hour has  
13          fallen between 2 p.m. and 6 p.m.<sup>9</sup> These are typically highly productive hours for solar  
14          generation. This indicates the projects will likely be operating at a much higher capacity  
15          than 19% during the time frame when PJM has historically experienced its peak summer  
16          hour. Furthermore, the PJM default value is *three times* what AEP has assumed in this  
17          filing. In short, it appears likely that AEP has undervalued the capacity benefits of the PV  
18          projects.

19   **Q.    Do you have a recommendation regarding how to approach determining the solar**  
20   **capacity value of these projects?**

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<sup>9</sup> <https://www.pjm.com/-/media/planning/res-adeq/pjm-peak-hour-history.ashx?la=en> Accessed on January 1, 2019.

1     A.     Yes, I do.

2           Assuming the solar projects are approved, the PUCO should require AEP to conduct a  
3           risk-reward analysis. That would include estimating the expected forgone capacity  
4           market revenues and expected adverse effects on market clearing prices for capacity (i.e.  
5           increased costs to consumers) that would result from each of a number of different  
6           decrements of expected capacity (e.g. 60%, 50%, 40%, 30%, 20%) relative to the 60%  
7           PJM default value for single-tracking PV. It would also include an estimate of the  
8           potential payment penalties under each of those different levels of conservatism in the  
9           bidding strategy. The Company should also develop reasonable estimates of the  
10          probability of each level of PJM capacity analyzed, inherently assigning probabilities to  
11          both capacity revenue streams and payment penalties under each of the different levels of  
12          capacity considered. Finally, the analysis should account for the potential to hedge  
13          against the risk through over-performance of efficiency programs (relative to what AEP  
14          bids into the market) and/or other means. The Company should then be required to bid  
15          into the capacity market a level of capacity that strikes a reasonable risk-reward balance,  
16          rather than one that principally considers only downside risk. That is particularly  
17          important if the PUCO is to insulate AEP from risk of under-performance, as the  
18          Company has requested. Otherwise, tens of millions of dollars that could accrue to all  
19          customers, may be lost. This type of risk analysis could be periodically updated based on  
20          actual project performance over time.

21    **Q.     Please explain how these solar projects provide a hedge against future market**  
22    **prices.**

1 A. The solar projects provide additional value because they reduce exposure to future fuel  
2 price volatility. Mr. Torpey acknowledges that the REPAs act as a price hedge against  
3 fuel price volatility because “as the PJM market price for energy fluctuates over the next  
4 20 years, the REPAs will maintain a level of stability relative to a portion of AEP Ohio  
5 customers’ energy costs.” However, Mr. Torpey did not include any monetary value for  
6 this benefit in his economic analysis. Put another way, his estimated \$41 to \$133 million  
7 of the net economic benefits of the projects includes no value for the risk mitigating  
8 effects of the projects.<sup>10</sup> But there certainly is a value to hedging fuel price volatility –  
9 and this value accrues to all customers.

10 **Q. Are there ways to quantify the economic value of such risk mitigation?**

11 A. Yes. As discussed in the 2017 National Standard Practice Manual for Assessing Cost-  
12 Effectiveness of Energy Efficiency Resources,<sup>11</sup> “there are different ways to value risk  
13 reduction.”  
  
14 For example, the most recent New England regional avoided cost study estimated the  
15 wholesale risk premium associated with fixed price contracts based on a review of  
16 confidential supplier bids in several states including Maryland (a PJM state). It found that  
17 the wholesale risk premium ranged from less than five percent to about ten percent. Not  
18 surprisingly, contracts that were only six to twelve months in duration had lower risk  
19 premiums than contracts up to three years in length. The report noted that three years

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<sup>10</sup> Direct Testimony of John W. Torpey, p. 8, lines 8 – 10. 18-1392-EL-RDR and 18-1393-EL-ATA.

<sup>11</sup> <https://nationalefficiencyscreening.org/national-standard-practice-manual/>

1 appears to represent “the limit of suppliers’ willingness to offer fixed prices.”

2 Ultimately, the study authors concluded it was reasonable to apply an eight percent  
3 wholesale risk premium to all avoided energy and capacity costs in order to capture the  
4 value associated with energy efficiency investments.<sup>12</sup>

5 Another approach is to compare the value of a resource under a ‘best estimate’ of future  
6 avoided costs to the value under a probability-weighted average of a wide range of future  
7 avoided costs. The difference between the two essentially represents a ‘risk premium’  
8 associated with future price volatility. Some energy efficiency cost-effectiveness  
9 screening tools (e.g., the DSMore tool developed by Integral Analytics, a Cincinnati-  
10 based firm) provide this capability.

11 Finally, since 1992, Vermont’s regulators have mandated that efficiency resource costs  
12 be reduced by ten percent to reflect efficiency’s ‘comparative risk and flexibility  
13 advantages’ relative to supply resources.”<sup>13</sup>

14 **Q. The examples you reference focus on energy efficiency. How are they applicable to**  
15 **the current filings pertaining to renewable resources?**

16 A. Energy efficiency and renewable project investments are similar in that the bulk of the  
17 costs are associated with upfront capital expenses, with little (for renewables) to no (for  
18 efficiency) operating costs. As a result, both insulate customers from future fuel price

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<sup>12</sup> Synapse Energy Economics et al., Avoided Energy Supply Components in New England: 2018 Report, Prepared for the AESC 2018 Study Group, as amended October 24, 2018 (see: <http://www.synapse-energy.com/sites/default/files/AESC-2018-17-080-Oct-ReRelease.pdf>), pp. 253-254.

<sup>13</sup> <https://nationalefficiencyscreening.org/national-standard-practice-manual/>

1 volatility in a very similar manner. Further, the REPAs are a fixed price contract for  
2 twenty years; this, by definition, lessens the risk of future fuel price volatility for all AEP  
3 Ohio customers.

4 **Q: How would these solar projects reduce market clearing prices for energy?**

5 **A:** As articulated by Mr. Ali, “locational marginal pricing (LMP) is a method of pricing the  
6 cost of congestion into electricity prices with the aim of encouraging the efficient use of  
7 the transmission system by assigning costs to users based on the way that energy is  
8 actually delivered. PJM uses LMPs to set prices for energy purchases and sales in the  
9 PJM market and to price transmission congestion costs. Congestion occurs when heavy  
10 use of the transmission grid causes parts of the grid to operate at their limits, resulting in  
11 the lowest-priced energy being prevented from freely flowing to a specific area of the  
12 grid. Therefore, LMPs form the basis for payments to generators and payments by buyers  
13 in the PJM electricity market and other such markets in the U.S. Generators are paid the  
14 LMP at their node for electric energy produced, and buyers pay the LMP at their node for  
15 electric energy consumed.”<sup>14</sup>

16 To identify the estimated LMP savings, the Company utilized the latest PROMOD®  
17 model to perform simulations of the PJM region using PJM transmission, generation  
18 resources, and load data developed in part of PJM’s Market Efficiency Analysis.  
19 PROMOD® is an electric market simulation software that has been used by the  
20 electricity industry for forty years. It incorporates future demand, generating unit

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<sup>14</sup> Direct Testimony of K. Ali, p. 3, lines 4 – 14. 18-501-EL-FOR.



1 operating characteristics, transmission grid topology and constraints and determines the  
2 hourly LMPs for both generation and load based on the incremental energy cost of the  
3 last MWHs produced and the congestion-related cost resulting from any transmission  
4 capacity limitations. This approach provides a good forecast of the impact that adding  
5 renewable projects will have on PJMs LMPs.<sup>15</sup>

6 **Q: What is the economic value of the market price suppression effects of these specific**  
7 **solar projects?**

8 A: I have not quantified the value, as that would require the kind of Integrated Resource Plan  
9 modeling effort conducted by the Company for its Amended LTFR, which I have neither  
10 the resources nor information necessary to carry out. However, the Company has  
11 estimated that the net present value (NPV) of the LMP suppression effects for 650 MWs  
12 of new renewable capacity is \$31 million. While the value of the price suppression  
13 effects for the solar projects being considered in this docket are likely to be lower than  
14 \$31 million since AEP is now considering a smaller amount of capacity than it analyzed  
15 in its Amended LTFR, they are still likely to be non-trivial. Again, the value of these cost  
16 reductions to AEP's customers were not included in Torpey's analysis.

17 **Q. What is the potential economic value of the additional revenue stream that could**  
18 **come from selling the renewable attributes through the Green Tariff?**

19 A. As provided through discovery, "the Company has not estimated the number of  
20 renewable energy credits (RECs) it expects to sell via the Green Tariff, but if all are sold

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<sup>15</sup> Ali, p. 4, lines 6 – 22. 18-501 EL-FOR.

1 from the estimated Year 1 production, then approximately \$6,927,500 would be applied  
2 to off-set the cost of the REPAs.”<sup>16</sup> Again, that is the maximum revenue from just the  
3 first year of a 20-year project.

4 **Q. Would you expect customer uptake of the Green Tariff to achieve this level of**  
5 **revenue?**

6 A. That is not knowable until the Tariff is offered. However, even if only half of the RECs  
7 are purchased, the result is still several million dollars of benefit (per year) to all  
8 Company customers. Furthermore, the fact that these are local RECs from Appalachian  
9 Ohio, and not wind RECs from Texas, may be seen as having a unique, additional value  
10 by some interested customers.

11 **Q. Are there additional benefits resulting from these projects – beyond those affecting**  
12 **electricity costs?**

13 A. Yes. There are several.

14 As shown in Table 1, additional direct, indirect, and induced benefits resulting from local  
15 economic development and jobs, are summarized in the testimony of Dr. Buser,  
16 submitted on behalf of the Company.<sup>17</sup> Additionally, Table 1 does not show the 113 full-  
17 time, permanent jobs (and any additional indirect or induced benefits resulting from these  
18 in-state jobs) that one of the project developers has committed to developing. As testified

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<sup>16</sup> AEP response to NRDC Discovery Request 1.6, provided as Attachment 2.

<sup>17</sup> Direct Testimony of Stephen Buser, p. 4, lines 13 – 22 and p. 5, lines 9 – 14. 18-1392-EL-RDR and 18-1393-EL-ATA.

1 by Mr. Williams, these jobs must exist for at least five years or the project developer  
2 suffers a price penalty.

3 **Table 1: Additional Economic Benefits**

<b>Area of Benefit</b>	<b>Construction Phase</b>	<b>Post-construction Phase</b>
<b>Additional tax revenue</b>	\$24 million for state \$8.4 million for local communities	\$320,000/year for state \$50,000/year for local communities
<b>Additional jobs</b>	3,870	50
<b>Additional earnings</b>	\$250 million	\$2.5 million
<b>Increase in output</b>	\$700 million	\$38 million
<b>Increase in Ohio's GDP</b>	\$390 million	\$33 million

4  
5 Finally, as articulated by Mr. Buser, the projects should also increase Ohio's economic  
6 competitiveness and improve public health.<sup>18</sup>

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<sup>18</sup> Direct Testimony of Stephen Buser, p. 2, lines 17 – 19; p. 5 – 6. 18-1392-EL-RDR and 18-1393-EL-ATA.

**V. THE LIKELIHOOD OF 900 MWS OF RENEWABLE DEVELOPMENT IN OHIO  
ABSENT APPROVAL OF THESE APPLICATIONS**

**Q. You state the “development of 900 MWs of renewables in Ohio would significantly increase the amount of solar and wind in Ohio.” What evidence can you provide as the basis of this statement?**

As of the third quarter of 2018, there was just under 190 MWs of solar installed capacity in Ohio.<sup>19</sup> If the Company’s proposed projects are approved, adding an additional 400 MWs of solar would result in a 200% increase above current levels.

As of the third quarter of 2018, there was 725 MWs of installed wind capacity, with 132 MWs under construction and 210 MWs in advanced development.<sup>20</sup> Assuming all of this is constructed, there would be 1,067 MWs of installed wind capacity in Ohio. If the Company develops an additional 500 MWs of wind, this would result in a 50% increase above and beyond the projects currently under construction.

**Q. You state that “absent PUCO approval of the development of these projects, it is unlikely that many - if any - in-state renewable energy projects of this size will occur.” What evidence can you provide as the basis of this statement?**

**A.** First, as shown in Table 2, while there are increasing amounts of wind and solar in Ohio’s generation mix, overall wind and solar remain a minimal part of the state portfolio<sup>21</sup>.

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<sup>19</sup> <https://www.seia.org/state-solar-policy/ohio-solar>

<sup>20</sup> <https://www.awea.org/Awea/media/Resources/StateFactSheets/Ohio.pdf>

<sup>21</sup> It should be noted that this table does not show energy efficiency penetration.



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1 Fourth, my experience as Executive Director of a renewable energy trade association has  
2 impressed upon me the critical role a long-term, signed contract with a credit-worthy  
3 entity plays for third-party, private developers in securing financing. Mr. Fetter mentions  
4 this briefly, in that “by committing to the long-term REPAs, AEP Ohio, a financially-  
5 strong contract counterparty, will be facilitating the ability of small developers to secure  
6 financing for their renewable projects and proceed with facility construction and  
7 operation.”<sup>23</sup> In my experience, this kind of contract can be the difference between a  
8 project being built or not.

9 Fifth, not approving these cost-effective, beneficial projects may send a message that  
10 PUCO does not feel confident in supporting the development of in-state renewable  
11 energy projects. In my experience, this can have a ripple effect throughout the market,  
12 potentially dampening other market interest. Conversely, approving these projects sends  
13 the opposite market signal, effectively saying that “Ohio is open to the business of in-  
14 state renewable development that saves money and strengthens the Ohio economy.”

15 Finally, the Company has made clear that it will not move forward with these projects  
16 unless it receives regulatory approval: “If regulatory approvals are not received in the  
17 periods identified in the REPAs, the Company will not move forward with the REPAs  
18 and they will be terminated.”<sup>24</sup>

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<sup>23</sup> Direct Testimony of Steven M. Fetter, p. 5, lines 1 – 3. 18-1392-EL-RDR and 18-1393-EL-ATA.

<sup>24</sup> Direct Testimony of Jon F. Williams, p. 8, lines 6 – 8. 18-1392-EL-RDR and 18-1393-EL-ATA.

## VI. CUSTOMER SUPPORT FOR INCREASES IN OHIO-BASED RENEWABLE ENERGY

**Q. You state that AEP's customers support increases in Ohio-based renewable energy. On what evidence is this statement based?**

A. Navigant’s report “AEP Ohio Voice of the Customer: Attitude & Expectations of Renewable Energy” shows strong support for increasing renewable development within Ohio.

As identified in the Navigant report, 75 of AEP Ohio's largest customers representing 8.8% of its commercial and industrial (C&I) load have corporate sustainability goals, for example committing to 100% renewable electricity or adopting greenhouse gas emissions reduction targets. These companies comprise "over 2,600 GWh in annual energy usage. This annual usage would require the procurement of approximately 2,090 MWs of solar PV capacity or 830 MWs of wind capacity."<sup>25</sup>

To assess the support level for in-state renewables amongst the residential and small C&I markets, Navigant conducted an on-line survey. The results indicate that a strong majority of residential non-PIPP, residential PIPP and small C&I customers believe it is important for AEP Ohio to increase its procurement of renewable energy. At least half of the participants in each customer group believe it is important that AEP Ohio provide in-state renewables. A majority of residential non-PIPP customers and many small C&I

<sup>25</sup> Direct Testimony of Trina Horner. Case No. 18-501-EL-FOR. Exhibit TH-1. “AEP Ohio Voice of the Customer: Attitudes and Expectations for Renewable Energy.” Page 14 of 41.

1 customers are also willing to pay some additional amount to achieve an increase in  
2 renewable energy procurement.<sup>26</sup>

3 **Q. Are you surprised by the findings from the Navigant survey?**

4 A. No, not at all. Customer interest in renewable energy is increasing significantly  
5 throughout the United States. A recent Consumer Reports survey found that 81% of those  
6 surveyed agree that reducing pollution from power plants is a worthwhile goal, 76%  
7 agree that increasing renewable energy is a worthwhile goal, and 70% agree that they  
8 expect electricity to become cleaner over time.<sup>27</sup> Meanwhile, a Pew Research Center  
9 survey found that two-thirds of Americans (who were surveyed) prioritize developing  
10 alternative energy sources over the expanded production of fossil fuel sources.<sup>28</sup>

11 **VII. THE COMPANY'S OBLIGATIONS UNDER 14-1693-EL-RDR**

12 **Q. Will the Company's proposals, if approved, also fulfill its obligations under 14-1693-**  
13 **EL-RDR?**

14 A. In the Stipulation in Case No. 14-1693-EL-RDR, the Company and its affiliates  
15 committed to proposing the development of at least 900 MWs of renewable energy  
16 projects in Ohio – at least 400 MWs of solar energy projects and 500 MWs of wind

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<sup>26</sup> Direct Testimony of Trina Horner. Case No. 18-501-EL-FOR. Exhibit TH-1. "AEP Ohio Voice of the Customer: Attitudes and Expectations for Renewable Energy." Page 36 of 41.

<sup>27</sup> "Majority of Americans Want Cleaner Energy From Renewable Sources." Farrell, M.H.J. October 29, 2018. Consumer Reports. <https://www.consumerreports.org/alternative-energy/majority-of-americans-want-cleaner-energy-from-renewable-sources/>

<sup>28</sup> "Two-thirds of Americans give priority to developing alternative energy over fossil fuels." Kennedy, B. January 23, 2017. Pew Research Center. <http://www.pewresearch.org/fact-tank/2017/01/23/two-thirds-of-americans-give-priority-to-developing-alternative-energy-over-fossil-fuels/>



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Direct Testimony of Gabrielle Stebbins  
On Behalf of Natural Resources Defense Council  
Pub. Util. Comm. Case No. 18-0501-EL-FOR et al.

1 energy projects.<sup>29</sup> If the company's proposal as filed in Case No. 18-501-EL-FOR is  
2 approved, then the company would be well positioned to deliver the value of in-state,  
3 large-scale renewable energy projects to customers and the State.

4 If the company's proposals under 18-1392 and 18-1393 are approved in a timely manner,  
5 then the company will be very well positioned to begin meeting their customer's requests  
6 and expectations for in-state renewable solar energy. Further, while some large  
7 commercial and industrial customers may have the ability to enter a bi-lateral agreement  
8 to procure the power and ensuing benefits from a large-scale, multi-MW solar farm, most  
9 Ohioans likely do not. By approving 18-1392 and 18-1393, the PUCO ensures that all  
10 AEP customers (regardless of whether they participate in the Green Tariff) accrue the  
11 multiple economic benefits (described earlier) that are achieved through large scale  
12 renewables. Finally, approval of the Green Tariff also provides the opportunity for AEP's  
13 larger commercial and industrial customers to enter into a bilateral contract for these  
14 projects once they have been built under a reasonable arrangement. This would reduce  
15 the RGR amount paid by all customers, providing even greater benefits.

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<sup>29</sup> Joint Stipulation and Recommendation, Case No. 14-1693-EL-RDR, Section III.I.

**VIII. STATE POLICY**

**Q. You state “The Company’s proposals are consistent with state policy.” Please explain this statement.**

**A.** The proposed 400 MWs of solar projects and potential 500 MWs of wind projects support multiple elements of state policy. For example:

1. The Company’s filings support R.C. 4928.02 (C), which seeks to:

- “Ensure diversity of electricity supplies and suppliers.” As shown in Table 2 above, in-state wind and solar generation makes up less than 2% of all energy generated in Ohio. Therefore, the proposed projects will increase the diversity of Ohio’s electricity supply.
- Give “consumers effective choices over the selection of those supplies and suppliers.” The proposed Green Tariff would allow customers the ability to “go renewable” to whatever degree they desire (meeting a portion of their electricity needs, all of their electricity needs, or more than their electricity needs.)<sup>30</sup> Some customers will prefer to install renewables on their property to offset their electricity consumption. However, other customers may not have this ability: they may rent their home, they may not have the appropriate site for renewables (too shady, roof constraints, too little land), or they may be concerned that they will not remain with the property long enough to see the

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<sup>30</sup> Application Case No. 18-1392-EL-RDR and No. 18-1393-EL-ATA, p. 3, Number 5.

1 return on investment. For these customers, the proposed Green Tariff provides  
2 them with a more flexible option – perhaps even their only viable option – for  
3 “going renewable.”

4 2. The Company’s filings support R.C. 4928.02 (J), which seeks to: “Provide coherent,  
5 transparent means of giving appropriate incentives to technologies that can adapt  
6 successfully to potential environmental mandates” because the proposed solar projects  
7 and potential future wind project(s) provide carbon-free energy that would help the  
8 Company comply with any future carbon emission regulations.

9 3. The Company’s filings also support R.C. 4928.02 (N), which seeks to “facilitate the  
10 state’s effectiveness in the global economy” by increasing employment opportunities in  
11 the renewable energy industry in Ohio. There are currently 3.2 million clean energy jobs  
12 in the United States, with solar making up 349,000 jobs and wind making up 107,000  
13 jobs.<sup>31</sup> Meanwhile, according to the U.S. Department of Labor, the fastest growing job in  
14 America is that of a solar installer, with the job of a wind technician the second-fastest  
15 growing job.<sup>32</sup>

16 In my role as Executive Director of a renewable energy trade association, I experienced  
17 first-hand the growth rate of the clean energy industry. Public and private interest and  
18 investment in this industry is palpable from multiple fields and sectors. Unsurprisingly,

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<sup>31</sup> <https://www.e2.org/cleanjobsamerica/> Accessed on January 2, 2019.

<sup>32</sup> <https://www.bls.gov/ooh/fastest-growing.htm> Accessed on January 2, 2019.

1       there are sectors that take notice of this growing economic opportunity such as  
2       manufacturing facilities and installation companies. But there is also an increase in interest  
3       and investment in the opportunities inherent in the renewable energy economy by other  
4       sectors: education and health care, finance and banking, law and science, agriculture and  
5       tourism. As mentioned earlier, showing that Ohio “is open for business” to solar and  
6       wind energy is an invitation to the clean energy economy to invest in Ohio – and these  
7       investments would be above and beyond the millions of dollars of savings the Company’s  
8       customers can expect from the 400 MWs of solar proposed in Highland County.

9       4. Finally, while not focused on renewable generation, the PUCO’s Power Forward  
10      initiative calls for improvements in areas that these proposed filings support. For  
11      example, the Power Forward principle, “Provide Net Value to Customers” is supported  
12      by the Company’s cost-effectiveness analysis and the other benefits discussed previously  
13      (those that have an economic value but were not quantified and not included in the cost-  
14      effectiveness analysis, as well as the multiple economic development benefits). Similarly,  
15      the Power Forward principle, “Enhance the Experience for All” and the objective “The  
16      Customer’s Way” call for answering the customer’s interests and needs and for  
17      increasing customer choice. The proposed filings advance these goals.

**IX. RECOMMENDATIONS**

**Q. Based on the evidence you provide above, what are your recommendations for the Commission?**

**A.** I recommend that the Commission approve (1) the Company's definition of need as articulated in 18-501-EL-FOR; (2) the Company's inclusion of two solar energy resources totaling 400 MWs of nameplate capacity solar energy in the Company's Renewable Generation Rider (RGR) as articulated in 18-1392-EL-RDR; and (3) the creation of a new Green Power Tariff (Green Tariff) under which customers may purchase renewable energy certificates (RECs) for the solar energy resources' environmental attributes as articulated in 18-1393-EL-ATA.

Finally, I recommend that (4) the Commission require the Company to complete a risk-reward analysis regarding the solar capacity value as described earlier in my testimony; and that the (5) the Company then be required to bid into the capacity market a level of capacity that strikes a reasonable risk-reward balance, rather than one that principally considers only downside risk.

**Q. Does this conclude your testimony?**

**A.** Yes, but I reserve the right to update and or supplement my testimony if new information becomes available.

## **CERTIFICATE OF SERVICE**

I hereby certify that a true and accurate copy of the foregoing *Direct Testimony of Gabrielle Stebbins on behalf of Natural Resources Defense Council*, has been filed with the Public Utilities Commission of Ohio and has been served upon the following parties via electronic mail on this 2<sup>nd</sup> day of January, 2019.

/s/ Robert Dove  
Robert Dove

*Attorney for NRDC*

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## GABRIELLE STEBBINS, SENIOR CONSULTANT

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### EDUCATION

M.A. in Development Studies: Sustainable Development, *Distinction*, Nelson Mandela Metropolitan University, Republic of South Africa, 2002

Coursework in Ethics and Public Policy, 4.0, Harvard University, Massachusetts (MA), 1999

B.A., Anthropology; B.M Violin Performance, *Cum Laude*, Rice University, Texas, 1998

### EXPERIENCE

2016-present: Senior Consultant: Energy Futures Group, Hinesburg, Vermont (VT)

2011-2015: Executive Director: Renewable Energy Vermont, Montpelier, VT

2008-2011: Program Manager: Vermont Energy Investment Corporation, Burlington, VT

2004-2008: Program Coordinator: Massachusetts Department of Fish and Game, Boston, MA

2002-2004: Environmental Educator: Town of Brookline, Waquoit Bay National Estuarine Reserve, MA

### PROFESSIONAL SUMMARY

Gabrielle specializes in the development of policy and programs for promotion of renewable energy, strategic electrification and energy efficiency, with a special focus on efforts to integrate all three. She has extensive expertise in policy and planning from work as a consultant, as director of Vermont's statewide renewable energy industry trade association, a member of the Vermont System Planning Committee (addressing transmission grid reliability planning) and as Chair of the Board of the Burlington Electric Department (BED), Vermont's largest municipal electric utility. In the latter role Gabrielle has provided strategic direction on BEDs IRP, maintaining BED's 100% renewably-sourced portfolio and on Burlington's goal to be a net zero city across all energy use by 2030. Gabrielle brings to her policy and planning work a grounded understanding of what it takes to move markets from policy incubation in the legislative arena, to program design in the regulatory arena, to the implementation arena, having managed residential efficiency programs, renewable energy incentive programs and – most recently – pilot programs to simultaneously promote efficiency, electrification of space heating and customer-sited renewables.

### SELECTED PROJECTS

- **Vermont Clean Energy Finance Report.** Conduct the research and analysis, including survey design and interview process, culminating in the 2018 Vermont Clean Energy Finance Report (currently draft form) (2018 – 2020).
- **Massachusetts “Solar Access” Program.** Design, develop, and manage a comprehensive retrofit program at 100 low-income properties incorporating heat pumps, solar and weatherization audits for the Massachusetts Clean Energy Center. Program requires no money down by coordinating existing financing and incentives and provides an energy savings guarantee (2017 - present).
- **Natural Resources Defense Council.** Review, analysis and critique of Michigan's Integrated Resource Planning process and outcome, with particular emphasis on development of renewable energy scenarios and related assumptions (2017). Review and analysis of utility efficiency program plan filings in Ohio and Maryland in support of expert witness testimony (2016).
- **New York State Energy Research and Development Authority (NYSERDA).** Manage the Hudson Valley Heat Pump Program – a comprehensive approach to residential energy savings incorporating heat pumps, weatherization, solar and detailed data savings monitoring (2017-present).



## GABRIELLE STEBBINS, SENIOR CONSULTANT

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- **Lawrence Berkeley National Laboratory.** Identify and implement methods to autopopulate the Multiple Listing Service with residential solar data in Vermont, New Hampshire (2016 – present).
- **Zero Energy Now!** Designed, managed a comprehensive package of efficiency retrofits, space heating electrification and renewable energy in Vermont residences on behalf of Building Performance Professionals Association, funded by Green Mountain Power (2015-2017).
- **NYSERDA.** Research, analysis for a Ductless Mini-Split Heat Pump Market Characterization Study (2016 - 2017).
- **Renewable Energy Vermont.** Managed industry association representing solar, wind, hydro, bio, geothermal and efficiency businesses. Responsibilities included policy development with the state legislature and utility regulators, oversight of public education efforts and renewable energy conferences. Doubled membership and budget during Executive Director tenureship (2011-2015).
- **Vermont Comprehensive Energy Plan.** Responsible for leading review and commenting on state energy plan on behalf of renewable industry (2011-2015).
- **Vermont Net-Metering Program.** Convened and oversaw the review, assessment, commenting and provided ongoing testimony on the continual development, legislative process and regulatory structure of Vermont's Net-Metering Program before Vermont's Legislature, Public Service Department and Public Service Board (2011-2015).
- **Vermont Renewable Energy Standard.** Convened and oversaw the review, assessment, commenting and provided ongoing testimony on the initial and legislative development and regulatory structure of Vermont's Renewable Energy Standard before Vermont's Legislature, Public Service Department and Public Service Board (2011-2015).
- **Vermont Small Scale Renewable Energy Incentive Program.** Managed the Vermont Small Scale Renewable Energy Incentive Program, including analysis and program modifications (2008-2011).
- **Vermont Community Energy Mobilization Project.** Designed, implemented and evaluated a volunteer-executed, "neighbor-to-neighbor" weatherization and efficiency program (2008-2010).

## SELECTED PRESENTATIONS AND PAPERS

- Speaker and Lead Author, **American Council on Energy Efficient Economy (ACEEE)**
  - "Burlington Electric Department: One Approach to the Utility of the Future." California. 2018.
  - "Next Generation Residential Retrofit Programs." Virginia. 2017.
  - "The Challenges of Comparing PV's Success to Efficiency." California. 2016.
- Speaker, **Solar Canada**, (Canada), 2016. "Group Net-Metering: Challenges and Opportunities."

## PROFESSIONAL AFFILIATIONS

- Member, Legislative and Policy Committee, **American Public Power Association**, (DC). December 2018 – present.
- Board Director, **Burlington Electric Commission**, (VT), 2014 – present. Chair: 2016 – present.
- Board Director, **Renewable Energy Vermont Education Fund**, (VT), 2013-2016.
- Supply-Side Representative, **Vermont System Planning Committee**, (VT), 2011–2014.



## **ATTACHMENT GS-2**

**OHIO POWER COMPANY'S RESPONSE  
TO NATURAL RESOURCES DEFENSE COUNCIL'S  
DISCOVERY REQUEST  
PUCO CASE NO. 18-501-EL-FOR, 18-1392-EL-RDR AND 18-1393-EL-ATA  
FIRST SET**

### **INTERROGATORY**

NRDC-INT-01-006      Has AEP estimated or projected any of the following:  
a) How many RECs it expects to sell via the Green Tariff;  
b) How many customers it expects to participate; and  
c) Which customer classes it expects to participate?

### **RESPONSE**

- a) The Company has not estimated the number of RECs it expects to sell via the Green Tariff, but if all are sold from the estimated Year 1 production, then approximately \$6,927,500 would be applied to off-set the cost of the REPAs.
- b) The Company has not estimated the number of customers it expects to participate. It is difficult to estimate the number of customers, because a small number of customers could acquire a high volume of RECs and vice versa or may be more uniformly distributed.
- c) The Company has not estimated which classes it expects to participate, but the Green Tariff is available to all classes as described in testimony of Company witness Williams.

Prepared by:    Jon F. Williams

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electronically filed by Mr. Robert Dove on behalf of Natural Resources Defense Council