BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Long-Term Forecast Report of Ohio Power Company And Related Matters	))))	**Case No. 18-0501-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**

INITIAL BRIEF OF NATURAL RESOURCES DEFENSE COUNCIL, OHIO ENVIRONMENTAL COUNCIL, AND SIERRA CLUB

The Natural Resources Defense Council, Ohio Environmental Council, and Sierra Club (Conservation Groups) respectfully request that the Public Utilities Commission of Ohio ("Commission") approve Ohio Power Company's (AEP Ohio or "Company") request for a finding of need for 900 MW of renewables in Phase I of the above-captioned case. The Commission is presented here with a proposal that will help to responsibly transition Ohio's coal-dependent communities to more sustainable economies as the state moves toward cleaner and healthier sources of energy; all while saving money and stabilizing bills for the electricity customers of AEP Ohio. The Commission should approve Phase I of this project because AEP Ohio has proven its case for need under the statute. The statutes and rules governing resource planning require the Commission to balance a host of factors to determine if a utility has demonstrated need for a generation facility, and AEP Ohio has provided the Commission with more than enough information to demonstrate need, if the Commission is really focusing on what that "need"

encompasses. Ohioans need not only energy and capacity supply, but we need long-term rate stability; we need the reliability that comes from having a diverse mix of generation; Ohioans need clean air and clean water; Ohioans need jobs and a robust economy to support their families and their communities.

AEP Ohio customers overwhelmingly support these renewable projects in southern Ohio. Electricity consumers, businesses, faith groups, economic development professionals, and others have voiced their support in various ways over the course of this proceeding. The Navigant study[1], submitted by AEP Ohio, showed strong support for AEP Ohio providing renewable energy produced in Ohio and for taking proactive steps to reduce its air pollution and greenhouse gas emissions. At a crowded, standing room-only public hearing hosted by the Commission on December 4, 2018, 54 people offered sworn testimony, and all 54 spoke in support of the project.[2] By the Conservation Groups' count, 3,378 people submitted public comments in the docket in these proceedings as of the date of this filing. And all 3,378 comments that were submitted expressed support for these renewable projects.[3]

AEP Ohio customers also support these projects because the proposal will drive economic development throughout Ohio, and especially in Appalachian Ohio, where the effects of the decline in mining, manufacturing and other coal industry jobs is being felt the most. The proposal will provide income to school districts, municipalities and

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[1] AEP Ohio Exhibit 7, "AEP Ohio Voice of the Customer: Attitude & Expectations of Renewable Energy."
[2] Pub. Util. Comm. Ohio, Case No. 18-501-EL-FOR, et al., Transcript, Public Hearing (Dec 4, 2018).
[3] Pub. Util. Comm. Ohio, Case No. 18-501-EL-FOR, et al., Public Comments, *available at* http://dis.puc.state.oh.us/CaseRecord.aspx?Caseno=18-0501&link=DIVAC.

counties. The proposal will also have the positive benefit of increasing the diversity of Ohio's generation mix and reducing peak energy prices on hot summer days, helping AEP Ohio customers hedge against future price volatility in the energy markets.

The projects will help to ensure Ohioans have greater access to cleaner air and water, further helping Ohio to reduce our greenhouse gas emissions and other air and water pollutants. Ohio is a major contributor to greenhouse gas emissions due to our heavy reliance on coal and natural gas to generate electricity.[4] The failure to take significant action to reduce those emissions will result in negative consequences for Ohio residents, the electricity consumers, and the state's economy. Adding 900 MW of clean, renewable energy to Ohio's generation mix is an important step toward reducing greenhouse gasses and other emissions that negatively impact Ohio's air and water quality.

As detailed below, AEP Ohio has proven its case for need, and the Commission should not bind itself with an overly restrictive interpretation of its statutory powers. The General Assembly requires the Commission to balance a variety of factors when determining the energy needs of Ohioans, including regional development, strengthening the economy, energy conservation, and environmental and health concerns. Any interpretation of need that does not account for factors such as those is both contrary to Ohio law and a relinquishment of the Commission's power over the process and responsibility to their fellow Ohioans. For the reasons that follow, the Commission

[4] OPAE Exhibit 1, Direct Testimony of David Rinebolt ("Rinebolt Direct Testimony") at 9, citing U.S. Energy Information Administration, Ohio Net Electricity Generation by Source, Sept. 2018, available at https://www.eia.gov/state/?sid=OH#tabs-4.

should approve AEP Ohio's request for need determination, and proceed with Phase II of the case.

I. The Commission has Broad Powers Under the "Need" Statute, and AEP has Demonstrated "Need" Within the Meaning of the Statute.

The Company, pursuant to a Commission directive,[5] seeks a finding of need for 900 MW of renewable energy under R.C. 4928.143(B)(2)(c). Revised Code 4928.143(B)(2)(c) authorizes the establishment of a non-bypassable surcharge for the life of an electric generating facility subject to certain prerequisites. In this first phase of the hearing, the question is whether or not there is a "need" for the 900 MW of renewable generation. Specifically, R.C. 4928.143(B)(2)(c) states, "[n]o surcharge shall be authorized unless the commission first determines in the proceeding that there is need for the facility based on resource planning projections submitted by the electric distribution utility."

"Need" is not a defined term within R.C. 4928.143, nor within the statutory definitions provided at the outset of Chapter 4928. Any lack of statutory guidance is to be read by the Commission as a grant of discretion. *In Re Columbus S. Power Co.*, 128 Ohio St.3d 512, ¶68, 2011-Ohio-1788 (April 19, 2011). (Citing to *Payphone Assn. v. Pub. Util. Comm.*, 109 Ohio St.3d 453, 2006 Ohio 2988, 849 N.E.2d 4, ¶ 25 ("When a statute does not prescribe a particular formula, the PUCO is vested with broad discretion"). When interpreting a statute the Commission should first look to the plain language of the statute itself to determine legislative intent. *Cleveland Mobile Radio*

[5] Pub. Util. Comm. Ohio, Case No. Case No. 14-1693-EL-RDR, Opinion and Order at 82-83 (Mar. 31, 2016).

Sales, Inc. v. Verizon Wireless, 113 Ohio St.3d 394, ¶12, 2007-Ohio-2203 (May 23, 2007). The Commission must give effect to the words used, making neither additions nor deletions from the words chosen by the General Assembly. *Id. See also Columbia Gas Transm. Corp. v. Levin*, 117 Ohio St.3d 122, ¶19, 2008-Ohio-511 (Feb. 14, 2008).

Under R.C. 4928.143(B)(2)(c), the "need" for the facility should be based on "resource planning projections". However, "resource planning projections" is not defined in either R.C. 4928.143 or within the statutory definitions provided at the outset of Chapter 4928. As such, this affords discretion to the Commission. In fact, the Commission has repeatedly exercised this discretion and crafted rules regarding the resource planning process that were not explicitly established by statute. Ohio Admin. Code 4901:5-5-06 (the "IRP Rule") is titled "Integrated Resources Plans" which establishes what the Commission requires be filed as part of a long-term forecast report filed pursuant to Rule 4901:5-3-01, as AEP's was in this case.

In the IRP Rule, the Commission provided guidance for what factors should be included for consideration when crafting a resource plan and determining the need for additional generation as required by R.C. 4928.143(B)(2)(c). The IRP Rule states:

> (2) Need for additional electricity resource options. The reporting person shall describe the procedure followed in determining the need for additional electricity resource options. <u>All major factors shall be discussed, including but not limited to</u>:
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> (a) System load profile.
> (b) Maintenance requirements of existing and planned units.
> (c) Number of units, unit size, and availability of existing and planned units.
> (d) Forecast uncertainty.
> (e) Electricity resource option uncertainty with respect to cost, availability, commercial in-service dates, and performance.

> (f) Lead times for construction or implementation of planned electricity resource options.
> (g) Power interchange with other electric systems, including consideration of the ability to buy and sell power.
> (h) Price-responsive demand and price elasticity due to the implementation of time-differentiated pricing options and assessments of the value of lost load.
> (i) Regulatory climate.
> (j) Reliability criteria, including a discussion and analysis of the reporting person's reliability criteria and factors influencing their selection, including, but not limited to:
> (i) Reliability measures used and factors including the selection.
> (ii) Engineering analysis performed.
> (iii) Economic analysis performed.
> (iv) Any judgments applied.

Ohio Admin. Code 4901:5-5-06(B)(2) et seq. (Emphasis added.) The Commission provided this list as guidance but explicitly noted that it is not an exhaustive list. The Rule also makes clear that need for additional electricity is based upon a host of relevant factors that must be taken into consideration together, and balanced.

The IRP Rule amplifies R.C. 4935.04, a statute entitled "Energy information and Reports", found in Chapter 4935 which governs energy data. Revised Code 4935.04(E) states that hearings related to the construction of additional generation are limited to "issues related to forecasting" and that those issues include, but are not limited to, the projected demand and capacity. Revised Code 4935.04(G) then directs the Commission to establish criteria for evaluating resource plans which is what the Commission did in the IRP Rule.

Further review of Chapter 4935 is instructive in understanding how the Commission crafted the non-exhaustive list of factors of "need" found in the IRP Rule. The first statute in Chapter 4935 is titled "Forecasting Energy Needs":

(A) The commission shall:

> (1) Estimate statewide and regional needs for energy for the forthcoming five- and ten-year periods which, in the opinion of the commission, will reasonably balance requirements of state and regional development, protection of public health and safety, preservation of environmental quality, maintenance of a sound economy, and conservation of energy and material resources. Other factors and trends which will significantly affect energy consumption such as the effects of conservation measures shall also be included;

R.C. 4935.01 (A)(1). (Emphasis added). The legislature used the word "shall", giving the legislature mandate, not merely a suggestion. *Dorrian v. Scioto Conservancy Dist.*, 27 Ohio St.2d 102, ¶1 of Syllabus, 271 N.E.2d 834 (July 7, 1971). ("In statutory construction, the word 'may' shall be construed as permissive and the word 'shall' shall be construed as mandatory unless there appears a clear and unequivocal legislative intent that they receive a construction other than their ordinary usage.") Not only is the Commission able to take into account a variety of factors to determine "need", including economic development and customer demand, but they are—in fact—required to do so by the General Assembly. The General Assembly ordered the Commission to consider and balance regional development, the maintenance of a sound economy, conservation and environmental concerns, and other factors and trends of significance to determine the need for additional energy.

Opposition parties have argued, since before the evidentiary hearing began, that "need" for purposes of resource planning is narrowly defined and the Commission has no authority to consider factors other than projected physical demand and projected physical capacity. Clearly, this limited and narrow interpretation is contrary to both the above

statutes related to energy and demand forecasting, and the very Rule governing integrated resource plans.

Revised Code 4935.01 is clear—the Commission is required to balance a variety of factors when determining the "need" for additional generation. Revised Code 4935.04 instructs the Commission to draft rules that govern integrated resource plans. Revised Code 4935.04(E) explicitly states that the hearings held under R.C. 4935.05(D)(3), which this hearing was[6], are limited to issues of forecasting but that those issues are not limited to simply the forecasting of demand and capacity. The Commission, with its mandate from the General Assembly to balance a variety of factors to determine need, crafted a non-exhaustive list in the IRP Rule to guide utilities on what to include for consideration. Every statute and rule makes it explicitly clear that the Commission is to balance a host of factors when reviewing resource planning projections to determine need for additional generation. And not one of those statutes or rules limits what the Commission may consider to a defined set of criteria.

Previous Commissioners, including the most recent Chairman, have already found that the Commission has broad authority to determine the "need" for additional generation. In a non-unanimous decision of the Commission cited by the opposition in their Motion in Limine, the Commission previously held that the utility in the Turning Point case failed to establish need for the proposed project based on resource planning

[6] Attorney Examiner Entry January 14, 2019, ¶4.

projections.[7] However, that decision was not unanimous and was based on a different evidentiary record. The majority did not explain which factors they relied on or which factors they felt were not strong enough. And one Commissioner disagreed entirely with their conclusion and held that he believed the signatory parties had proved there was a need for the proposed generation especially in light of the Commission's mandated considerations found in R.C. 4935.01.[8]

More recently, former Chairman Haque discussed the authority of the Commission over in-state generation and the responsibility that comes with that authority. In the very case the Commission directed AEP to pursue in-state solar generation which ultimately led to AEP's proposal in this case, Chairman Haque stated,

> I am a believer in wholesale markets for reasons associated with the discipline of economics. Clearly though, state governments have been expressing some recent trepidation with the markets. There are more states than Ohio that are exercising, or contemplating to exercise their retail jurisdictional authority associated with existing generation (mostly nuclear), or have attempted to incent new generation. Why? What is the root cause of this? I am not entirely sure. Conceptually for the markets, what I think would be essential is that trust and confidence exist in the markets from not only the actual market participants, but in this case, those who are forced to deal with the collateral damage associated with market operation.
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> If the states, who are the most directly accountable to consumers for the impacts of wholesale markets (even though they do not plan or operate them) start to feel pressure, whether from their consumers, utilities, interest groups, etc., and this pressure is either supplemented by, or helps to bolster a lack of trust and confidence in the markets themselves, then states will contemplate exercising

[7] In the Matter of the Long-Term Forecast of Ohio Power Company and Related Matters, Case Nos. 10-501-EL-FOR et seq., Opinion and Order at 25-27 (Jan. 9, 2013) ("Turning Point").
[8] *Id*. at Dissenting Opinion of Commissioner Steven D. Lesser, 1-2.

> their given legal authority associated with their in-state generation.[9]

Chairman Haque recognized that the market does not always rise to the needs to the consumer especially in a manner or speed acceptable to the consumer. Chairman Haque also recognized that the Commission has the legal authority to incent or direct new generation to be built when it wishes to protect customers from the collateral damage associated with market operation.

The legal authority Chairman Haque referenced is the same authority discussed above. The General Assembly has given the Commission the authority to approve new generation in R.C. 4928.143. The General Assembly has maintained that authority for the Commission through several rounds of revisions and amendments to Chapter 4928 since its adoption. The General Assembly directed the Commission to consider a whole host of factors when deciding whether or not to authorize new generation in R.C. 4935.01 and to make rules regarding resource planning in R.C. 4935.04. The Commission has made those rules and crafted a broad, non-exhaustive list of factors to consider and balance to determine need via the resource planning process in Ohio Admin. Code Chapter 4901:5.

The pressure Chairman Haque referenced in his concurrence exists and has come to bear in this case. AEP Ohio has provided the Navigant survey which documents that the vast majority of the AEP Ohio customer base wants them to build and use in-state

[9] In the Matter of the Application to Enter into an Affiliate Power Purchase Agreement, Case Nos. 14-1693-EL-RDR et seq. Opinion and Order, Concurring Opinion of Chairman Haque at 9 (March 31, 2016).

renewables.[10] Additionally, over fifty people, who spoke on behalf of a wide range of interests, came to the public hearing in this case and spoke out in support of AEP Ohio's proposal. No one spoke against it.[11]

This is the very situation that Chairman Haque predicted. Now is the time for the Commission to exercise the power granted to it by statute as recognized by its former Chairman. The General Assembly has required the Commission to consider more than just simply projected demand and capacity in forecasting generation need. Factors such as the economy, regional development, and conservation of both energy and the environment are all codified in R.C. 4935.01. The Commission's own rules direct utilities to include a discussion of the same and similar factors as well as others. AEP Ohio has done just that in this case.

The statutes and rules clearly give the Commission broad authority in what it can take into consideration in making a determination of whether there is a "need" for the projects AEP Ohio has proposed. This authority has already been recognized by past Commissioners, including the most recent Chairman. If the Commission adopts a narrow definition of need, it negates its directive from the General Assembly to consider a broad range of factors, contravening its own rules and the statutes that grant it authority. Therefore, pursuant to R.C. 4928.143(B)(2)(c), R.C. 4535.01, and the relevant rules which amplify those statutes the Conservation Groups respectfully request that the Commission find that need is undefined and need determinations are the product of a

[10] AEP Ohio Exhibit 7.
[11] Pub. Util. Comm. Ohio, Case No. 18-501-EL-FOR, et al., Transcript, Public Hearing (Dec 4, 2018).

balancing of a variety of factors provided through resource planning projections. Additionally, the Conservation Groups request that the Commission find that AEP Ohio has demonstrated a "need" for its proposed projects as shown below.

II. Utility-Scale Solar and Wind Offers Benefits to Ohio.

Utility scale solar and wind resources offer significant benefits to Ohioans on both economic and environmental fronts. Where these resources have high penetration, the impact has been generally to lower energy market clearing prices, including peak energy prices, resulting in reduced energy costs for consumers. Utility-scale renewables projects also provide economic development and job opportunities, often in regions that desperately need it and often are not sites favored by large job creating companies. And these projects provide clean, renewable energy right in these communities, leading to reduced air pollution, providing cleaner air for its residents to breathe. The positive impact these large projects will have on the region is immense, and these reasons factor into why the Commission should approve AEP Ohio's case for need.

A. Utility-Scale Solar and Wind Projects Lower Energy Market Clearing Prices, Reducing Energy Costs for Consumers.

AEP Ohio is in the PJM Interconnection region, and PJM uses locational marginal pricing ("LMP") to determine the price of electricity. This method factors congestion on the grid into electricity pricing, with a goal of encouraging efficient use of the transmission system.[12] Where heavy use of the transmission grid causes strain on parts of

[12] AEP Ohio Exhibit 5, Direct Testimony of Kamran Ali ("Ali Direct Testimony") at 3; *see also* AEP Ohio Exhibit 26, Rebuttal Testimony of Kamran Ali.

the grid, the lowest-priced energy can be prevented from freely flowing to a specific area of the grid.[13] But, in regions where renewable generation has significantly penetrated the market, such as ERCOT and CAISO, the impact has generally been to lower energy market clearing prices--including peak energy prices.[14] Because energy market clearing prices are set based on marginal production costs, and renewables projects have large up-front capital costs but very low marginal production costs (including zero fuel costs), they are able to significantly reduce energy market clearing prices in PJM.[15] This makes renewables a much lower energy cost than other sources of generation, and is a benefit to all customers in AEP Ohio's service territory.

As shown by Company witness Mr. Kamran Ali, adding renewable resources to AEP's system will lower LMPs compared to the current base case.[16] Mr. Ali's analysis used the unmodified version of the model developed by PJM for Market Efficiency Analysis and compared it to the "Study Case", which modeled three new renewable projects (one wind and two solar projects) with similar characteristics to existing projects.[17] When adding 650MW of renewable projects in Ohio, there is a reduction in LMP for the AEP zone as well as a reduction in total yearly energy costs that AEP Ohio and other load serving entities pay to PJM for energy from the PJM system for their customers.[18] So even with the Study Case, which is 250MW less than the project proposed by AEP Ohio in the subject case, AEP Ohio and other load serving entities

[13] *Id*.
[14] Sierra Club Exhibit 1, Direct Testimony of Michael Goggin ("Goggin Direct Testimony") at 30.
[15] Goggin Direct Testimony at 30 FN 48.
[16] Ali Direct Testimony at 6.
[17] *Id*. at 5.
[18] *Id*. at 5, Fig. 1.

would see a reduction in costs they pay PJM for the energy they provide to their customers. If the Study Case had modeled for 900 MW of renewables, the price reduction for energy purchased from PJM would likely have been even greater, consistent with the analysis presented by AEP Ohio in this proceeding and previous analysis by the Commission.[19] As more renewables projects are built, energy market clearing prices will continue to go down.

AEP Ohio then took this a step further with the analyses done by Company witness John Torpey, which showed the impact that lower LMPs have on the PJM market over the life of the Study Case projects and the projected amount that AEP Ohio's customers would save from adding a 650MW of generic renewable resources.[20]

[19] Goggin Direct Testimony at 30.
[20] AEP Ohio Exhibit 14, Direct Testimony of John Torpey ("Torpey Direct Testimony") at 6.

AEP Ohio's Proposed Renewable Investment Benefit Summary

ANALYSIS	RESULT
PJM Impact	**Economic Benefit:** • LMP price reduction of $0.07/MWh, and • NPV savings of $31 million to AEP Ohio customers.
AEP Ohio Impact	**Economic Benefit:** • NPV benefit of $88 million from the 400 MW generic solar resources, and • NPV benefit of $54 million from the 250 MW generic wind resources.
Total Customer Benefit	PJM Benefit $31 M Solar Benefit $88 M Wind Benefit $54 M $173 M
Break-Even Analysis	Actual REPA costs lower than the REPA price noted below result in lower costs to AEP Ohio customers: • SOLAR: REPA costs below $56.82/MWh • WIND: REPA costs below $48.40/MWh
Probabilistic Simulation	• 100 % of the time solar projects result in a net benefit • 99.9% of the time wind projects show a net benefit.

Mr. Torpey also recognized that reducing congestion across the AEP load zone has the ancillary benefit of lowering LMPs for all entities purchasing from that load zone, creating not only direct benefits but ancillary ones as well.[21] But most importantly, for AEP Ohio customers, the PJM impact analysis and the AEP Ohio impact analysis both show significant cost benefits.[22] Further, the break-even analysis shows REPAs with costs lower than the break-even values indicated have the potential to lower AEP Ohio's costs, giving the Commission a value point at which to ensure any REPA is going to provide benefits to customers.[23] Finally, AEP Ohio also performed a probabilistic

[21] Tr. Vol. V at 1373 (Torpey Cross).
[22] *See* Torpey Direct Testimony at 6, Table.
[23] *Id.*

simulation to ensure that it properly accounted for the volatility inherent in the PJM market.[24] Every one of the analyses done by AEP Ohio found that the generic 650MW proposal resulted in economic benefits to AEP Ohio customer.[25]

B. Utility-scale Renewables Projects Provide Economic Development and Job Creation in Regions of Ohio that Desperately Need it.

The AEP Ohio proposal for 900 MW of renewable energy projects offers an opportunity for economic development in regions of Ohio that have suffered through recent and past economic recessions. The projects are proposed to be built in Highland County, an area with a poverty rate of 19.8%, with 28.4% of all children living in poverty.[26] Over 43% of the population had incomes under 200% of the federal poverty line, which, according to census data, qualifies families for low income weatherization programs with surrounding counties eligible at similar rates.[27] One of the largest employers in the area left, taking 10,000 jobs with it in 2008.[28]

The proposed projects, however, will help to fill the gaps left when job creators leave these communities and the surrounding area. The projects will provide both direct and indirect benefits, including local tax revenue, thousands of construction jobs, both short term and ongoing operations and maintenance jobs, landowner lease payments, and more. As projected by the economic impact analysis done by AEP Ohio's witnesses Professor Stephen Buser and Mr. Bill Lafayette, *Impacts of Solar Plant Construction and*

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[24] Torpey Direct Testimony at 11-12.
[25] Further, the AEP Ohio impact analysis shows customer benefits with or without factoring in capacity credit. Tr. Vol. VI at 1513 (Torpey Redirect).
[26] Rinebolt Direct Testimony at 7.
[27] *Id.*
[28] *Id.* at 8.

Operation on the Ohio Economy,[29] the construction of the new facilities will create 3,870 new jobs, and Ohio earnings for Ohio workers will grow by more than $250 million.[30] The economic impact analysis also showed that the construction of the projects grow output by nearly $700 million, and the value added measure of the net effect on Ohio's gross domestic product would grow by nearly $390 million.[31] Further, the economic impact analysis showed that while the post-construction annual operating economic effects are smaller in magnitude, they will continue indefinitely.[32] Witnesses Buser and Lafayette also project that continuing Ohio employment will grow by roughly 50 jobs, with earnings for Ohio workers growing by more than $2.5 million, output will grow by more than $38 million, and the value-added measure of the net contribution to the Ohio economy will grow by more than $33 million.[33]

Both projects have also committed to sourcing equipment within Ohio, and the Hecate Solar REPA has committed to at least 113 full-time permanent jobs not related to the construction or operation of the solar facility.[34] The Highland Solar project will create 150 permanent manufacturing jobs in southern Ohio, in addition, as projected by AEP Ohio witnesses Professor Buser and Mr. Lafayette.[35] The overall impact and benefit to this region in terms of job creation is enormous.

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[29] AEP Ohio Exhibit 12, Direct Testimony of Stephen Buser ("Buser Direct Testimony") at Ex. SB/BL-1.
[30] AEP Ohio Exhibit 12, Direct Testimony of Stephen Buser ("Buser Direct Testimony") at 4.
[31] *Id.* at 4.
[32] *Id.*
[33] *Id.*
[34] AEP Ohio Exhibit 13, Direct Testimony of Bill Lafayette ("Lafayette Direct Testimony") at 5.
[35] Mid-Atlantic Renewable Energy Coalition Exhibit 1, Direct Testimony of Bruce Burcat ("Burcat Direct Testimony") at 8; Lafayette Direct Testimony at 5.

Not only will the construction and operation of the facilities themselves create jobs, but these projects will be able to attract companies that have corporate sustainability goals that Ohio is not currently able to meet. This project brings great opportunity to support job creation in a community that needs it by attracting corporations with sustainability goals.[36] As John Molinaro, President and CEO of Appalachian Partnership, Inc., testified,

> Our Appalachian Partnership for Economic Growth subsidiary, and I think perhaps others in the JobsOhio Network, regularly run into barriers in attracting e-commerce and foreign firms to Ohio because of the lack of renewable-energy resources available and sourced in Ohio to those firms. Most of the e-commerce ventures require renewable energy. Many of the foreign direct-investment projects we see require renewable energy and we lose those opportunities when we can't provide that from Ohio generating sources.[37]

The Navigant report identified 75 of AEP Ohio's largest customers, representing 8.8% of its commercial and industrial load, have corporate sustainability goals and comprise over 2,600 GWh in annual energy usage.[38] Renewable utility-scale projects have the ability to draw investment in Ohio from these types of companies, and continue to stimulate the economy in these areas.

The economies of these communities will also benefit through payments in lieu of taxes that will support their local school districts, and municipal and county governments. For example, those benefits are projected to be over $1 million per year for the life of the

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[36] Goggin Direct Testimony at 32-33.
[37] Case No. 18-501-EL-FOR, et al., Dec. 4th Public Hearing, Transcript at 76-77 (Dec. 14, 2018).
[38] *See* NRDC Exhibit 1, Direct Testimony of Gabrielle Stebbins ("Stebbins Direct Testimony") at 20, citing AEP Ohio Exhibit 6, Direct Testimony of Trina Horner at 14.

Willowbrook Solar project.[39] The economic impact study done by Professor Buser and Mr. Lafayette, estimated that construction of the new facilities will generate more than $24 million additional tax revenue for Ohio, and that the construction of the facilities will generate $8.4 million in additional tax revenue for local communities in Ohio, while the increase in annual tax revenue from continuing operations is projected to be nearly $320,000 each year for the state and to add more than $50,000 per year for local communities in Ohio.[40]

C. 900 MW of Renewable Generation in Ohio Will Significantly Reduce Air Pollution in the Region.

The societal and environmental benefits must not be overlooked in this case, as reducing air pollution significantly improves quality of life for Ohioans, making our residents healthier, our businesses and schools more productive, and our communities more sustainable while assisting in efforts to mitigate the worst impacts of climate change. Furthermore, as previously discussed, the General Assembly requires the Commission to consider the protection of public health and safety, and the preservation of environmental quality when determining the needs of Ohioans. The U.S. Environmental Protection Agency's own tool indicates that adding 900 MW of renewable generation in Ohio would significantly reduce air pollution in the region.[41]

As Sierra Club Witness Michael Goggin showed using the AVoided Emissions and geneRation Tool (AVERT), sulfur dioxide emissions would be reduced by 956 tons

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[39] Burcat Direct Testimony at 8-9.
[40] Lafayette Direct Testimony at 5.
[41] Goggin Direct Testimony at 30-31.

per year, annual nitrogen oxides emissions would be reduced by 796 tons, and particulate matter (<2.5 micrometer) emissions would be reduced by 168 tons annually.[42] As Mr. Goggin explained, "[t]hese pollutants cause environmental degradation, including smog and acid rain, and contribute to cardiopulmonary health problems including asthma, bronchitis, heart attacks, and even death."[43] These climate and environmental benefits are important to the health and well-being of the citizens of Ohio, and the Commission should take these into account when determining what generation is needed in Ohio.

The addition of 900 MW of clean, renewable energy to Ohio's generation mix is an important step toward protecting Ohioans health and reducing greenhouse gas emissions quickly. As OPAE witness Rinebolt noted, the most recent report of the Intergovernmental Panel on Climate Change (IPCC) makes clear that climate change is threatening our planet, and the negative environmental consequences, and resulting impacts to our health, from the continued burning of fossil fuels are increasing.[44] Ohio must reduce air pollution from the electric power sector, and it must do so rapidly in order to protect the health and safety of Ohioans and protect Ohio's environment. Moving toward solar generation will result in fewer premature deaths, and fewer instances of the breathing problems caused by emissions from fossil fuel plants,[45] a major concern in Ohio due to our heavy reliance on coal and natural gas to generate

[42] *Id*.
[43] *Id.*
[44] Rinebolt Direct Testimony at 11.
[45] *Id*.

electricity.[46] Staff witnesses do not address any of these important aspects, instead myopically focusing on whether we have enough energy to keep the lights on in Ohio.

To ensure projects of this magnitude are built and address these health and environmental issues, the Commission must approve this proposal. Natural Resources Defense Council Witness Stebbins explained that projects of this size most likely will not be built if AEP Ohio's case for need is disapproved, due in part to the fact that Ohio's Alternative Energy Portfolio Standard (AEPS) does not require any portion of it to be met with in-state renewable resources, and the difficulty of securing financing for large projects such as these.[47] But the health of Ohio both now and in the future demands we act now, and act decisively.

The Commission is required to factor the health and well-being of the citizens of the state of Ohio into its determination of need in this case. The Commission must weigh health and environmental benefits along with the tremendous economic benefits these projects present, and should find that AEP Ohio has demonstrated a need for its proposed facilities.

III. Current Options for Renewables Procurement in Ohio are Inadequate.

There is limited utility scale solar in Ohio, despite the fact that it is significantly more economic than smaller scale solar and would move Ohio toward reducing our greenhouse gas emissions and other pollutants from the electric sector more quickly.

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[46] Rinebolt Direct Testimony at 9, citing U.S. Energy Information Administration, *Ohio Net Electricity Generation by Source*, Sept. 2018, available at https://www.eia.gov/state/?sid=OH#tabs-4.
[47] Stebbins Direct Testimony at 17-19.

While the Conservation Groups are pleased to see rooftop solar growing in Ohio and the costs for these installations continuing to decline, rooftop solar still isn't an option for every Ohioan. Many Ohioans, including renters or those who own homes without the appropriate roofs or property, cannot install solar at their homes even if they are able to afford it. In fact, 43% of all residential buildings are not suitable for solar.[48] So while opponents of these AEP Ohio projects point to this proposal as harming the market, these projects actually allow additional customers—both renters and those homeowners without adequate rooftops or property—to participate in Ohio's clean energy market. Additionally because the projected costs of AEP Ohio's proposal per customer are fairly low, any anticipated impact on rooftop solar installation payback periods would be minimal, and therefore unlikely to affect the rooftop solar market.

Additionally, while competitive retail energy suppliers (CRES) are able to offer products with "green" or renewable attributes, the opportunities are limited for customers, both in their ability to purchase green/renewable energy from Ohio-based renewable energy suppliers and for the length of time these customers are able to enter into a contract for energy. Staff Witness Timothy Benedict testified that there were a "multitude of CRES provider offerings that are, in whole or in part, renewable products", noting that residential customers in AEP Ohio territory had twenty-nine CRES provider offerings that were 100% renewable content.[49] However, no CRES provider offers a product that supports new solar or new wind in Ohio. So, for customers who want to

[48] Rinebolt Direct Testimony at 10.
[49] Staff Exhibit 2, Direct Testimony of Timothy Benedict at 10.

support expansion of solar/wind in Ohio, the current CRES offerings don't provide an option. Further, it appears there is only one offering for a 100% renewable product sourced for an already-existing Ohio wind farm. While AEP Ohio Witness Allen was unable to confirm that one existed when he reviewed the data in late October and December 2018,[50] there does appear to be one product in the Apples-to-Apples list of offerings indicating it supplies customers with Ohio wind energy.[51] Instead, 100% renewable offerings on the Apples-to-Apples site are generally national or regional RECs that support already-existing projects located in other states.[52] Development of the AEP Ohio projects will have no impact on consumers' ability to buy out-of-state RECs, but it will create a project allowing AEP Ohio customers to support in-state development of renewable resources, per their preferences as outlined in the Customer Survey.

Additionally, projects like AEP Ohio's proposal allow customers to be part of a long-term contract for renewable procurement, providing price stability and certainty. No such option is available to the average consumer using the PUCO Apples-to-Apples shopping website. As MAREC Witness Bruce Burcat noted, for a consumer shopping on the PUCO's Apples-to-Apples site, the longest contract a shopping customer is able to enter into is three years.[53] For small commercial customers seeking out renewables contracts, many do not have the appropriate credit ratings, experience, or access to capital to develop renewable energy projects on their own or to enter into long-term contracts to

[50] Tr. Vol. II at 357 (Allen Cross).
[51] *See* AEP Ohio Exs. 21 and 23.
[52] AEP Ohio Ex. 21, Residential Apples-to-Apples Comparison Charts.
[53] Tr. Vol. VIII at 2082-83.

support renewable development, but AEP Ohio does have that ability. Further, many such customers may not have sufficient load to procure renewable energy on their own even if they did have access to those markets and capital. Ohio will benefit from AEP Ohio partnering to develop renewable energy projects because the utility can take advantage of economies of scale, low-cost financing, and development expertise that some customers cannot take advantage of.

Ohio consumers want local, clean energy that has an impact on their air quality and their world. As Eddie Smith, Athens County Township Trustee, stated in his public testimony, "...consumers in Ohio, particularly in my community, want renewable energy and they are willing to pay more for it. Rational consumers are not only concerned about prices; rational consumers are also concerned about how their consumption today affects their consumption in the future."[54] The proposal by AEP meets the required definition of need under Ohio law, and the Commission should approve the proposal.

IV. PJM's Markets Discriminate Against Renewables, Which Supports a Finding of "Need" for AEP Ohio's Proposal.

In addition to the reasons offered above which support a need finding, because PJM market rules inhibit the development of renewable energy in Ohio, a finding of need is further justified in this case. As Sierra Club witness Michael Goggin testified, due to certain aspects of the PJM market design, renewable energy deployment in the PJM wholesale market, including in Ohio, is falling short of the level that would optimally

[54] Case No. 18-501-EL-FOR, et al., Dec. 4th Public Hearing, Transcript at 19 (Dec. 14, 2018).

serve the economic interests of AEP Ohio's customers.[55] PJM's market rules inhibit renewable deployment in Ohio in at least two general ways.[56]

First, PJM's reliance on a robust capacity market tends to depress energy revenues, which disproportionately impacts renewable projects that are more dependent on energy market revenues than other types of generation. Second, the volatility and ongoing uncertainty in the PJM capacity market disproportionately inhibits renewable project developers because these projects have higher up-front capital demands than other projects and are more dependent on capital financing. These market design considerations explain, at least in part, why Ohio has lagged behind other states in utility-scale renewable energy development and support a finding of need for Commission action to support renewable energy development.

A. Resource Quality and Economics Do Not Explain Why the PJM Region has Lagged Behind Other Regions in Renewables Deployment.

PJM renewable deployment is falling short of levels seen in other regions, despite strong renewable resources and favorable economic fundamentals in the PJM region. Nationally, wind and solar provide around 8.9% of electricity generation, yet they account for only 2.8% of generation in PJM.[57] Ohio and PJM have good wind and solar resources, so that alone cannot explain the lower level of utility-scale renewable development. In particular, new wind turbine designs utilizing taller towers and longer blades have brought PJM wind project output (as measured by project capacity factor) up

[55] *See* Goggin Direct Testimony.
[56] Mr. Goggin's testimony describes many other ways that the PJM markets discriminate against renewable energy projects. *See id*. at 14-27.
[57] *Id*. at 5.

to the same range as seen in other regions. Recent wind projects in the region have averaged a 39.3% capacity factor, only slightly lower than the national average for new projects of 42.2%, and the 43.2% average achieved in the highest-performing region.[58]

Similarly, fixed-tilt solar projects in PJM have averaged a capacity factor of around 20%,[59] only somewhat lower than the 24.8% and 26.1% realized in California and the Southwest, respectively. Many other regions with slightly better renewable resources have lower energy market prices than PJM, and so higher PJM prices would be expected to incent proportionally higher renewables deployment than a comparison of renewable resources alone.[60] Thus, PJM's lagging utility-scale renewable development cannot be explained by resource quality and economic factors alone, indicating that PJM market structure and rules are a significant factor impeding utility-scale renewable development relative to other regions.

B. PJM's Capacity Market Suppresses Energy Prices and Fails to Provide Reliable Revenues, which Inhibits Renewables Deployment.

PJM's capacity market is a primary cause of low renewable deployment in Ohio.[61] Capacity markets in general disadvantage renewable resources—by shifting revenues from energy markets (where renewables perform well) to capacity markets (where they have performed less-well compared to other resources under existing market rules). In addition, PJM's capacity market has slowed renewables deployment because of the tremendous uncertainty in market rules and prices, such that renewable project

[58] *Id*. at 6.
[59] *Id*.
[60] *Id*. at 6-7.
[61] *Id*. at 9-21.

developers—which unlike other generators have high up-front capital demands and very lower operating costs—have been less able to depend on the capacity market to support project financing. Together, these aspects of the PJM capacity market have been a drag on utility-scale renewables deployment in PJM and Ohio.

Capacity market payments tend to incent the retention of excess generation capacity, which has the effect of depressing energy market revenues.[62] In regions without capacity markets, all generation costs are typically recovered from the energy market when, during a small number of hours per year when energy supply is scarce, energy market prices increase to very high levels. For the last decade, PJM has consistently overestimated future load growth in its capacity market procurements, which has resulted in few scarcity events in the energy market. By procuring excess capacity, PJM's capacity market tends to cause fewer scarcity hours in the energy market, keeping energy market prices lower than they otherwise would be.[63]

Compared to other energy sources, utility-scale renewable energy projects generally obtain a relatively large share of their value from the energy market, and a relatively small share of their value from the capacity market. The presence of a capacity market drives revenue from the energy market to the capacity market, and thus deprives renewable energy projects of revenue.[64] As the share of total market revenue recovered through the capacity market increases, renewable energy projects tend to be negatively affected. In ERCOT, the grid operator for Texas, renewable resources have flourished, in

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[62] *Id*. at 10.
[63] *Id*.
[64] *Id*.

part because revenue that in PJM is recovered through the capacity market is instead recovered through the energy market.[65]

In addition, PJM's capacity market has slowed utility-scale renewables deployment because developers cannot rely on projections of stable market revenues for financing purposes. PJM capacity market prices are highly volatile, having fluctuated by a factor of ten from year to year over the last decade.[66] Because annual capacity market revenue is more volatile than energy market revenue and subject to significant changes through the PJM stakeholder process and at FERC, it is more heavily discounted by renewable developers and their financiers.[67] PJM's Capacity Performance rules and the proposed Minimum Offer Pricing Rule, which could further shift costs from the energy to capacity markets, exemplify the ongoing change and uncertainty in the PJM capacity market rules.[68]

This uncertainty disproportionately harms renewable resources as they require a far greater percentage of their capital investment up front than fossil-burning generators. In contrast to fossil-burning resources, renewable resources have no fuel costs and smaller ongoing operating and maintenance costs. A much larger share of their total lifetime cost is incurred upfront, and therefore must be financed. Power generation debt and equity

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[65] *Id*. at 10-11.
[66] *Id*. at 11.
[67] *Id*. at.
[68] In its Minimum Offer Price Rule proposals, PJM proposed changes that would exclude resources that receive state policy support—such as, in Ohio, the Ohio Valley Electric Corporation coal-burning plants—from capacity market revenues in an attempt to mitigate the impact of state policies on capacity market prices. As yet, no MOPR rule has been made final.

investors are risk averse, so they discount uncertain future cash flows.[69] The fact that capacity market payments in PJM have shifted revenues away from the energy market as well as the ongoing uncertainty in the market is a significant reason why less renewable generation has been built in PJM than in other regions, and yet another reason to support a Commission finding of need in this case.

V. The Commission Should Disregard the Testimony of OCC Witness Lesser, A Decades-Long Denier of Climate Change Science.

The Commission should disregard the testimony of OCC witness Jonathan Lesser. The Commission, as the finder of fact in proceedings before it, is charged with determining the bias and honesty of witnesses. Witnesses before the Commission may generally be subject to some perceived biases (e.g., financial or institutional motivation), which the Commission can reasonably consider in assessing the weight of their testimony. But Dr. Lesser's testimony is of a different category—Dr. Lesser has a well-documented, 20-year record of dishonesty about climate change science, including peddling climate conspiracy theories. His testimony should not be relied upon by the Commission in any utilities proceedings, but most especially in one that pertains to renewable energy development in Ohio.

For two decades, Dr. Lesser has peddled baseless commentary about climate science, despite lacking any training in science. While he repeatedly said on the stand that he is not a climate scientist,[70] none of his writings on the topic contain this

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[69] *Id*. at 11, 13.
[70] Tr. Vol IV at 1591-92, 1594, 1607, 1608, 1609, 1613, 1616, 1618, 1620 (Lesser Cross).

disclaimer.[71] In 2007, Lesser began writing for a trade publication and was welcomed by the editor of that publication to "add a voice of reason about global warming and *other so far-unproven theories*."[72] Over the next decade, Lesser carried through on that promise by criticizing climate scientists. He has referred to climate scientists as "ivory-tower thugs"[73] who have "perverted the scientific method for their own gain."[74] Relying on no scientific training, he purported to suggest an "end" to the "global warming trend" may be near, based upon his own interpretation of solar activity data.[75] Despite (correctly) conceding on the stand that he lacks the qualifications to judge the validity of scientific analysis,[76] he accused NASA scientist James Hansen of "artificially manipulat[ing]" data "to show warming temperatures."[77] Again, though he admittedly lacks any training in the sciences whatsoever, in an assessment that is indisputably not the work of an economist, he states that climate change may have "little to do with man-made CO2 emissions."[78] And though he denied referring to the U.S. EPA as the "devil" when questioned on the stand,[79] his writing speaks for itself.[80]

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[71] *See* Sierra Club Exhibits 2-9.
[72] Sierra Club Exhibit 2, "GoldiLocks and the Three Climates," page 1 of 2, column 1 (emphasis added).
[73] Sierra Club Exhibit 3, "As the Global Climate Turns: The Saga Continues," page 1 of 4, column 2.
[74] Sierra Club Exhibit 3, page 2 of 4, column 2.
[75] Sierra Club Exhibit 6, "Outlook-Sunspot Data May Indicate End of Global Warming Trend," page 1 of 2.
[76] Tr. Vol IV at 1609 ("I'm not a climate scientist. I am not qualified to review Mr. Hansen's research or his -- his data analysis on temperatures.").
[77] Sierra Club Exhibit 6, page 2 of 2.
[78] Sierra Club Exhibit 9, "Goldilocks Chills Out," page 3 of 3.
[79] Tr. Vol IV at 1604 (Lesser Cross).
[80] Sierra Club Exhibit 5, page 3 of 3, column ("EPA's Second Act. With the proposed rule for new generators under its belt, the EPA intends to issue carbon emissions limits for existing generators in 2014. Perhaps the Devil will take the high road, but in the war—er, domestic contingency operation—against coal, do not bet on it.").

In perhaps his most egregious example of climate denialism, Dr. Lesser has lent support to the so-called "ClimateGate" conspiracy theory.[81] The conspiracy theory claims that a small number of scientists have somehow manipulated data and duped the entire scientific community into believing that humans are causing a planet-wide increase in temperature—a theory which lacks even superficial plausibility. (If a few professors had manipulated data, would that call into question the theory of gravity?) Even on the stand in this case, Dr. Lesser refused to disclaim his support for this conspiracy theory, while at the same time he admitted he lacked any scientific training that would give him the ability to judge the science.[82] Bizarrely, then, Dr. Lesser testified both that he is not qualified to judge climate science, and that he continues to defend his statements, claiming that climate scientists manipulated data to further their personal monetary goals.

History will be the judge of climate change deniers like Dr. Lesser, as he and others have spread misinformation about one of the most pressing problems facing this country. But importantly in this matter and in cases before this Commission, Dr. Lesser's proven record as a conspiracy theorist and denier of climate change renders him an abjectly unreliable witness, and the Commission should reject any consideration of his testimony.

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[81] Sierra Club Exhibit 7, "Talk is Cheap: the UN's Doha Conference Strikes Out . . . Again," page 3 of 3, column 1 ("Moreover, the efforts by some to manipulate the scientific process to further their aims, such as the "Climategate" emails reveal, as well as efforts to demean those who dare question the "certainty" of the climate science as cave dwelling Troglodytes, reveals not scientific inquiry but naked politics.")
[82] Tr. Vol. IV at 1600 (Lesser Cross).

VI. Conclusion

For the foregoing reasons, the Conservation Groups urge the Commission to approve AEP Ohio's request for a finding of need.

Dated: March 6, 2019

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing Conservation Groups' Initial Post-Hearing Brief has been filed with the Public Utilities Commission of Ohio and has been served upon the following parties via electronic mail on this 6th day of March, 2019.

/s/ Miranda Leppla
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Summary: Brief Initial Brief of Natural Resources Defense Council, Ohio Environmental Council, and Sierra Club electronically filed by Ms. Miranda R Leppla on behalf of Natural Resources Defense Council and Ohio Environmental Council and Sierra Club