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August 11, 2020

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

Re: Amended Application of Transource Pennsylvania, LLC for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – East and West Projects in portions of York and Franklin Counties, Pennsylvania
Docket Nos. A-2017-2640195, A-2017-2640200

Amended Petition of Transource Pennsylvania, LLC for a finding that a building to shelter control equipment at the Rice Substation in Franklin County, Pennsylvania is reasonably necessary for the convenience or welfare of the public
Docket No. P-2018-3001878

Amended Petition of Transource, Pennsylvania, LLC for a finding that a building to shelter control equipment at the Furnace Run Substation in York County, Pennsylvania is reasonably necessary for the convenience or welfare of the public
Docket No. P-2018-3001883

Amended Application of Transource Pennsylvania, LLC for approval to acquire a certain portion of the lands of various landowners in York and Franklin Counties, Pennsylvania for the siting and construction of the 230 kV Transmission Line associated with the Independence Energy Connection – East and West Projects as necessary or proper for the service, accommodation, convenience or safety of the public
Docket Nos. A-2018-3001881, et al.

Dear Secretary Chiavetta:

Attached for electronic filing please find the Office of Consumer Advocate's Main Brief in the above-referenced proceedings.

Copies have been served on the parties as indicated on the enclosed Certificate of Service.

Respectfully submitted,

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|---|---|---|
| Amended Application of Transource Pennsylvania, LLC for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – East and West Projects in portions of York and Franklin Counties, Pennsylvania | Docket Nos. | A-2017-2640195<br>A-2017-2640200 |
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I hereby certify that I have this day served a true copy of the following document, the Office of Consumer Advocate's Main Brief, upon parties of record in this proceeding in accordance with the requirements of 52 Pa. Code Section 1.54 (relating to service by a participant), in the manner and upon the persons listed below:

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

| | | |
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| Amended Application of Transource Pennsylvania, LLC for approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection - East and West Projects in portions of York and Franklin Counties, Pennsylvania. | : | Docket No. A-2017-2640195<br>Docket No. A-2017-2640200 |
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# MAIN BRIEF
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Dated: August 11, 2020

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## I. INTRODUCTION

In the instant proceeding, Transource Pennsylvania, LLC (Transource or Company) seeks approval from the Pennsylvania Public Utility Commission (Commission) to site and construct the Pennsylvania portion of the Independence Energy Connection Project (IEC Project or the Project). The IEC Project was approved by PJM Interconnection, LLC (PJM) as a market efficiency project. As a market efficiency project, Transource alleges that the IEC Project is needed to alleviate economic congestion on the AP South Reactive Interface thereby lowering wholesale market power prices in Maryland, Virginia, the District of Columbia (D.C.) and a small portion of Western Pennsylvania. Transource St. 3 at 24-25.

Pursuant to Sections 332(a) and 1501 of the Public Utility Code, the Company has the burden of proof to demonstrate that the IEC Project is necessary to maintain adequate, efficient, safe, and reasonable service and facilities. 66 Pa. C.S. §§ 332(a), 1501. Under the Commission's Regulations, the Company must demonstrate the following:

> **(1)** That there is a need for it.
>
> **(2)** That it will not create an unreasonable risk of danger to the health and safety of the public.
>
> **(3)** That it is in compliance with applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth.
>
> **(4)** That it will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives.

52 Pa. Code § 57.76(a). In light of the Commission's obligations under the Environmental Rights Amendment as outlined in Pennsylvania Environmental Defense Foundation v. Commonwealth of Pennsylvania, et al., 161 A.3d 911, 930 (Pa. 2017) (PEDF), the Company has a heavy burden to meet each of the statutory and regulatory requirements for a transmission siting project that

infringes upon the environmental rights of Pennsylvanians. The OCA also notes that, as part of this proceeding, the Company is seeking approval to exercise eminent domain to acquire portions of Pennsylvania property[1] to site and construct the IEC Project.

The OCA submits, however, that this market efficiency project designed to address economic congestion on the bulk electric grid cannot meet the constitutional, statutory, and regulatory standards under Pennsylvania law. Under the evidence presented, actual congestion on the AP South Reactive Interface has diminished precipitously in the years since this proceeding began, subverting any reason to construct this Project. Moreover, PJM's benefit-cost analysis, which the Company relies upon to allege that this Project will provide sufficient benefits in excess of the costs, contains significant deficiencies such that it cannot support the necessary findings under Pennsylvania law. Most importantly, PJM's benefit-cost analysis ignores the detrimental impacts of increased wholesale power prices that accrue to certain transmission zones as a result of constructing the IEC Project, including many transmission zones in Pennsylvania seeing increased costs for Pennsylvania ratepayers. In addition, PJM's process for approving the IEC Project failed to consider reasonable alternatives and did not address the serious environmental and property issues raised.

Ultimately, the Company is seeking approval to construct a market efficiency project to address a problem that has resolved itself and only purports to demonstrate net benefits in PJM's forward-looking models. Yet, even so, under PJM's forecasts, approval of the IEC Project would result in a net reduction of $32.5 million in wholesale power prices across the entire PJM region

[1] As the Public Input Hearing testimony in this matter provides, some of the land that Transource proposes to burden with its Project is preserved farmland that has been placed in preservation through the efforts of the landowners, with the substantial support of Pennsylvania taxpayers. See e.g., the testimony of (now) Senator Kristin Phillips-Hill. Tr. at 102-105. See also the testimony of Mr. Doug Wolfgang, Director of the Bureau of Farmland Preservation. Tr. at 663.

over a period of 15 years, while allowing the Company, and other entities responsible for construction of the IEC Project, to recover approximately $527 million over that same period. This Project makes no economic sense and is simply insufficient under Pennsylvania law.

More specific to Pennsylvania, while a portion of Western Pennsylvania is forecasted to experience approximately $27 million in lower wholesale power prices over 15 years, the rest of Pennsylvania would experience approximately $429 million in increased wholesale power prices over that same period of time. In addition to this net economic harm, Pennsylvania would also be burdened by new transmission infrastructure construction in Franklin and York Counties, including a new substation and a new transmission line in Franklin County, 13.6 miles of which will be constructed over presently unencumbered land, and lengthy re-builds of additional transmission infrastructure and a new substation in York county. Accordingly, these economic and environmental harms demonstrate that the IEC Project fails to meet the constitutional, statutory, and regulatory standards under Pennsylvania law.

Lastly, the Commission should not approve the IEC Project based upon the Company's claims of ***potential*** reliability violations occurring in 2023 in the absence of the IEC Project. The Company's belatedly filed evidence is based upon limited testing and outdated data. Moreover, the facilities that may experience these potential violations are aging facilities that are due for an upgrade in the coming years. Indeed, since 2018, several of the facilities that the Company claims will overload are undergoing rebuilds that may increase capacity. The OCA submits that if the IEC Project is not approved, PJM has the means to determine if these potential future reliability violations will still occur and find more efficient, targeted proposals to correct these issues.

For the reasons set forth herein, the Commission should deny the Company's Applications. The OCA sets forth the following in support of its position.

## II. STATEMENT OF THE CASE

On December 27, 2017, Transource filed two Applications with the Commission seeking approval of the siting and construction of the Pennsylvania portion of two 230 kV transmission lines associated with the IEC Project in portions of York and Franklin Counties. The Applications were as follows:

- Application of Transource Pennsylvania, LLC Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – East Project in Portions of York County, Pennsylvania, A-2017-2640195 (IEC East Application)

- Application of Transource Pennsylvania, LLC Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – West Project in Portions of Franklin County, Pennsylvania, A-2017-2640200 (IEC West Application)

As indicated above, the IEC Project is composed of two portions, an East and West Portion. Specifically, for the West Portion, the Company proposed to construct a Rice Substation in Franklin County and a new 230 kV transmission line extending 28.8 miles to connect the existing Ringgold Substation located near Smithsburg, Washington County, Maryland to the proposed Rice Substation in Franklin County, Pennsylvania, also known as the Rice-Ringgold 230 kV Transmission Line (collectively, the West Portion of the IEC Project). IEC West Application at 10-11. Of the 28.8 miles of the proposed Rice-Ringgold 230 kV Transmission Line, 24.4 miles will be located in Pennsylvania and this is the portion the Company is seeking approval to construct from this Commission, in addition to the Rice Substation. Id., at 11. With respect to the East Portion, the Company originally proposed to construct a Furnace Run Substation in York County and a new 230 kV transmission line extending 15.7 miles to connect the existing Conastone Substation located near Norrisville, Harford County, Maryland to the proposed Furnace Run Substation in York County, also known as the Furnace Run-Conastone 230 kV Transmission Line

(collectively the original configuration of the East Portion of the IEC Project). IEC East Application at 10-11. Of the 15.7 miles of the proposed Furnace Run-Conastone 230 kV Transmission Line, 12.7 miles were to be located in Pennsylvania. Id., at 11.

As support for the IEC Project, the Company asserts that the IEC Project is a market efficiency project designed to relieve congestion on the AP South Reactive Interface, a set of four 500 kV transmission lines that originate in West Virginia and terminate in Maryland. Transource St. 3 at 7-8. The Company's evidence relies on the determinations that PJM made during its Regional Transmission Expansion Plan (RTEP) process. IEC West Application, Att. 2 at 2. PJM conducts a market efficiency analysis during its RTEP to find areas where congestion exists and seeks solutions to reduce congestion. Id., at 2-3. In this instance, PJM identified a constraint caused in part by the inability for additional electricity to flow East and South of the AP South Reactive Interface, which caused load-serving entities in Virginia, Maryland, and Washington D.C. to rely on higher-cost generation, rather than low-cost generation North and West of the constraint. Transource St. 3 at 25. The Company asserts that alleviating this constraint will lead to a more efficient use of generation resources across the PJM region and lower wholesale power prices for load-serving entities in Virginia, Maryland, Washington D.C., and a portion of Western Pennsylvania. Id. PJM's basis for selecting the IEC Project is that it exceeded the 1.25:1 benefit-cost threshold required under PJM's Operating Agreement for market efficiency projects, purportedly providing the most benefits of the projects submitted. Transource St. 3 at 31.

On January 10, 2018, after reviewing the Company's Applications, the OCA filed a Protest seeking to protect the interest of Pennsylvania's ratepayers. The OCA's focus in this matter has primarily involved investigation of the following areas: (1) the extent to which congestion currently exists on the AP South Reactive interface, (2) the methods by which the Company and

PJM determined the benefits and costs produced by the IEC Project, (3) whether the IEC Project is the most appropriate solution, if one is needed at all, and (4) the impacts to Pennsylvania ratepayers and the PJM region if this Project is constructed.

The OCA notes that the procedural history of this proceeding is extensive and is detailed in Appendix A attached to this brief. In addition to the OCA, some of the parties participating in the proceeding included Citizens to Stop Transource – York County (Citizens), STOP Transource Franklin County (STFC), York County Planning Commission (YCPC), and the County of Franklin, among others.

This proceeding raised significant concerns in the local communities and those directly affected by the construction of the IEC Project. Many Protests, Petitions to Intervene, and Comments in Opposition were filed by members of the public. In addition, twelve public input hearings were convened in Franklin and York Counties to receive input and evidence from those affected. The OCA captures some of the specific testimony in its Appendix B attached to this Brief and more generally in Section VI.D. The OCA commends the public for its participation in this proceeding. Site visits were also convened to view the affected properties in order for landowners to demonstrate the specific impacts of the IEC Project in Pennsylvania. Altogether, the evidentiary record contains almost 2,000 pages of material documenting these public input hearings and site visits.

The record also contains written testimony from participating parties. The OCA in particular submitted the following direct testimony in this proceeding on September 25, 2018: OCA Statement 1, the Direct Testimony of Scott J. Rubin[2], OCA Statement 2, the Direct

[2] Mr. Rubin is an independent attorney and public utility industry consultant under contract with the OCA who has testified as an expert witness before utility commissions and courts in seventeen states and the District of Columbia and province of Nova Scotia. OCA St. 1 at 1-3. Since 1984, Mr. Rubin has provided legal and consulting services to

Testimony of Peter J. Lanzalotta[3], and OCA Statement 3, the Direct Testimony of Geoffrey C. Crandall[4]. Additionally, on January 30, 2019, the OCA submitted the following surrebuttal testimony: OCA Statement 1SR, the Surrebuttal Testimony of Scott J. Rubin, OCA Statement 2SR, the Surrebuttal Testimony of Peter J. Lanzalotta, and OCA Statement 3SR, the Surrebuttal Testimony of Geoffrey C. Crandall. Evidentiary hearings were held from Thursday, February 21 to Wednesday, February 27, 2019, to admit the expert testimony into the record and for the purposes of conducting cross-examination.

In November 2018, the Company filed its rebuttal testimony indicating that if the Commission did not approve the IEC Project and the IEC Project were not constructed several potential future reliability violations may occur in 2023. Transource St. 7-R at 22. This included ***potential*** thermal overloads involving facilities located near the Project area. Accordingly, the Company was now contending that reliability violations may result in the absence of the IEC Project. The Company, however, continues to assert that the Project is still a market efficiency project, not a reliability project needed to resolve reliability concerns. It should be noted that these reliability concerns were not identified until several years after PJM selected the IEC Project and

a variety of parties interested in public utility regulatory proceedings. A complete description of Mr. Rubin's qualifications is provided in OCA Statement 1, Appendix A.

[3] Mr. Lanzalotta is a Principal at Lanzalotta & Associates, LLC, whose areas of expertise include electric utility system planning and operation, electric service reliability, cost of service, and utility rate design. OCA St. 2 at 2. He is also a registered professional engineer in the sates of Maryland and Connecticut. Id. Mr. Lanzalotta has presented expert testimony before FERC and before regulatory commissions and other judicial and legislative bodies in 25 states, including Pennsylvania. OCA St. 2 at 3. A further description of Mr. Lanzalotta's qualifications is provided in OCA Statement 2, Sch. PJL-1 and PJL-2.

[4] Mr. Crandall is a Principal and Vice President of MSB Energy Associates, Inc. Mr. Crandall has over 40 years of experience in utility regulatory issues, including resource planning, restructuring, mergers, fuel, purchase power and gas cost recovery and planning analysis, energy efficiency, conservation and load management impacts, program design, and other issues. OCA St. 3 at 1. Mr. Crandall has provided expert testimony before a dozen public utility regulatory bodies throughout the United States. Id. Prior to his current role, Mr. Crandall had over 15 years of experience on the staff of the Michigan Public Service Commission. Id.

almost an entire year after this case was filed with this Commission.[5] In response to these claims, the OCA filed the following testimony on May 29, 2019, responding to the new information provided by the Company: OCA Statement 2SSR, the Supplemental Surrebutal Testimony of Peter J. Lanzalotta.[6]

During the course of the proceeding, the OCA, the other parties, and local community members identified two existing transmission lines near the proposed Furnace Run-Conastone 230 kV Transmission Line owned and operated by PPL Electric Utilities Corporation (PPL) that could serve as an alternative to the original configuration of the East Portion of the IEC Project. OCA St. 2 at 20. Specifically, PPL owns the Manor-Graceton 230 kV Transmission Line and the Conastone-Otter Creek 230 kV Transmission Line currently operating as single-circuit lines, but capable of operating as double-circuit transmission lines. Id., at 20-21. That is, the poles on both transmission lines currently hold one set of conductors, but are capable of holding two.[7] Id. After extensive investigation, testimony, and evidentiary hearings, the Company determined that it could re-route the proposed Furnace Run-Conastone 230 kV Transmission Line to PPL's two existing lines by re-conductoring the Manor-Graceton and Conastone-Otter Creek 230 kV Transmission

[5] In response to these new claims, STFC filed a Motion to Amend the Procedural Schedule and to Strike Certain Testimony (STFC Motion to Strike) on December 13, 2018. On December 31, 2018, the Sixth Prehearing Order was entered granting the STFC Motion to Strike noting that the testimonies associated with reliability concerns or potential violations effectively altered the scope and complexity of the issues to be addressed by the opposing parties. Sixth Prehearing Order at 5. The Sixth Prehearing Order was later overturned by the Commission seeking to ensure the development of a full and complete record, but noting that "evidence regarding reliability benefits realized under the Project may or may not be found to support the asserted need for the project." Opinion and Order at 22 (entered Mar. 20, 2019).

[6] On November 27, 2019, the Thirteenth Prehearing Order was issued admitting OCA St. 2-SSR into the evidentiary record by stipulation.

[7] When asked why PPL re-built the Conastone-Otter Creek and Manor-Graceton 230 kV Transmission Lines as single-circuit lines when the poles are capable of holding two circuits, PPL witness Ali stated that, while he was not involved in planning those projects, it is typical practice to design for future double circuits in case there is a need for it in the future. Tr. at 2356-57. Mr. Ali indicated that when the lines were rebuilt in 2015 and 2017, respectively, the second conductors may not have been added because a need was not identified at that time. Id.; see also Transource Hearing Exh. 10, PPL Response to Transource Set I, Question 12.

Lines as double circuit lines. Transource St. 7-SUPP at 6. Moreover, two 2-mile segments could be added by expanding the right-of-way (ROW) of an abandoned transmission line currently owned by PPL to connect both re-conductored lines to the proposed Furnace Run Substation. Id., at 2, see also Transource Hearing Exh. 5 at 4.

On January 29, 2020, Transource filed an Amended Application for the East Portion of the IEC Project in cooperation with PPL seeking to re-route the proposed transmission line in accordance with the alternative configuration identified above.[8] IEC-East Amended Application at 10. While PPL would continue to own the Manor-Graceton and Conastone-Otter Creek Transmission Lines and the two additional 2-mile segments, Transource would continue to own, maintain, and operate the new Furnace Run Substation. IEC East Amended Application at 11. The OCA will refer to this as the alternative configuration of the East Portion of the IEC Project. The Company asserts that the IEC Project, inclusive of the alternative configuration of the East Portion of the IEC Project, will continue to alleviate congestion on the AP South Reactive Interface and prevent the occurrence of any ***potential*** future reliability violations. Id.

An additional evidentiary hearing was held on July 9, 2020, for the purposes of admitting the remaining evidence into the record and conducting cross-examination regarding the Company's reliability claims and the amended configuration of the IEC Project. The OCA now submits the following Brief in support of its position.

[8] On January 29, 2020, Transource and PPL jointly filed the Amended Application seeking approval to construct the alternative configuration of the East Portion of the IEC Project. While Transource and PPL are considered Joint Applicants for the East Portion, due to the extensive record in this proceeding prior to PPL's entry as a Joint Applicant and for the reader's convenience, the OCA will only refer to Transource as the proponent in this matter. Please note, however, that when the OCA is discussing Transource with respect to the East Portion of the IEC Project, the OCA is referring to Transource and PPL jointly.

## III. SUMMARY OF THE ARGUMENT

The OCA submits that the Company has failed to prove that the IEC Project is necessary to maintain adequate, efficient, safe, and reasonable service and has failed to meet the constitutional, statutory, and regulatory requirements for approval of a transmission line project in Pennsylvania.

While developed specifically to reduce congestion on the AP South Reactive Interface, actual congestion on this constraint has precipitously declined and is not projected to recover. See Transource St. 3 at 24, Transource St. 8-R, Exh. TH-5R at 2. At the time PJM solicited proposals to solve this issue, congestion on the AP South Reactive Interface totaled approximately $800 million from 2012 to 2016. Transource St. 3 at 25. In 2014, the cost of congestion on the AP South Reactive Interface was approximately $487 million. OCA Cross Exh. 7 at 2. Since the selection of this Project in 2016, congestion on the AP South Reactive Interface has diminished, such that, in 2019, the annual congestion cost on the AP South Reactive Interface was approximately $14.5 million. Tr. at 2921. Most recently, through the first quarter of 2020, the congestion cost on the AP South Reactive Interface was less than $900,000, failing to make the list of the top 25 most congested facilities in the PJM region. OCA Hearing Exh. 6 at 559. For this reason, the purpose for which this Project was designed no longer exists.

Moreover, while the Company claims that the IEC Project demonstrates sufficient purported benefits based upon PJM's analysis and that it exceeds PJM's 1.25:1 benefit-cost threshold for market efficiency projects, PJM's analysis is flawed in several respects and is insufficient to demonstrate need under Pennsylvania law. The most fundamental flaw in PJM's analysis is that PJM does not include transmission zones that experience an increase in the price of energy when calculating the benefits of the IEC Project. OCA St. 1 at 24. As a succinct example

of this, if a new market efficiency project were to reduce wholesale power prices by $10 million in certain transmission zones, but increase wholesale power prices by $8 million in other transmission zones, PJM would recognize a benefit of $10 million to the entire PJM region. See OCA Hearing Exhibit 1, Transource Response to OCA-II-15. It is inappropriate to exclude direct economic impacts resulting from an action when performing a benefit-cost analysis and particularly when determining need for the purposes of transmission siting and eminent domain under Pennsylvania law. OCA St. 1 at 23-24. When calculating the benefit-cost ratio correctly, the IEC Project under PJM's forward-looking model provides net benefits of $32.5 million over a period of 15 years. With a present value revenue requirement (PVRR) of $527 million, that amounts to a benefit-cost ratio of 0.06. The other flaws in PJM's methodology, which will be discussed in more detail in this Brief, result in an overstatement of the benefits of this Project by ignoring certain future generation in the affected zones, particularly generation and demand reduction resulting from state legislative and policy initiatives in the affected region.

The Company's forecasts demonstrate that while the IEC Project is presented as a means to improve economic efficiency, the Project would be detrimental to other PJM Transmission Zones, including in Pennsylvania. While the Company's projections indicate that wholesale power prices for load-serving entities in Virginia, Maryland, Washington D.C., and a portion of Western Pennsylvania will decrease by approximately $845 million over fifteen years, wholesale power prices will increase by approximately $812.5 million in portions of Pennsylvania, New Jersey, Ohio, Delaware, Maryland, Kentucky, and Illinois over that same period of time. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4, see also OCA Cross Exh. 10. Moreover, load-serving entities in transmission zones that do benefit will have to pay for the costs to construct, operate, and maintain the IEC Project over its service life. OCA St. 1 at 36. In the first fifteen

years alone, load-serving entities in Virginia, Maryland, Washington D.C., and Western Pennsylvania are expected to pay at least $527 million. Transource St. AA-3, Exh. TJH-AA3 at 4. This offsets more than half of the alleged wholesale power price benefit provided to those transmission zones as a result of constructing the IEC Project.

Pennsylvania ratepayers in particular receive no overall benefit from this Project. While PJM's latest re-evaluation forecasts that a small portion of Western Pennsylvania may experience reduced wholesale power prices of approximately $27 million over the first fifteen years, wholesale power prices will increase by approximately $429 million in the rest of Pennsylvania. See OCA Hearing Exh. 3, Transource Response to OCA-XLII-15.[9] Accordingly, this Project provides little to no benefit to Pennsylvania ratepayers while impacting Pennsylvania's environment from construction of 13.6 miles of greenfield construction, in addition to the two new substations and brownfield construction of several more miles of transmission line.

Regarding, the availability of reasonable alternatives, the Company failed to demonstrate that the IEC Project is the most reasonable alternative to address the alleged congestion on the AP South Reactive Interface. PJM's process to identify market efficiency projects is to seek solutions

[9] The APS Transmission Zone is composed of a portion of Western Pennsylvania, West Virginia, Maryland, and Virginia. See OCA Cross Exh. 10. PJM's latest re-evaluation indicates that APS will see reduced wholesale power prices of approximately $60 million over the first 15 years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-15. To calculate Pennsylvania's share of the benefits, the OCA measured Pennsylvania's percentage of peak demand contributed to the APS system in the summer of 2018, which was approximately 44.75 percent. OCA St. 1, Sch. SJR-6 at 2. Accordingly, Pennsylvania would likely experience approximately $27 million in reduced wholesale power prices for the first fifteen years of the IEC Project's service life, or 44.75 percent of the total APS zone's benefit.

With respect to FE-ATSI, PJM's latest re-evaluation indicates that the FE-ATSI Transmission Zone will see increased wholesale power prices of approximately $24.5 million over the first 15 years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-15. Pennsylvania only comprises a portion of the FE-ATSI Transmission Zone. See OCA St. 1, Sch. SJR-6 at 2. To calculate Pennsylvania's share of the detriment, the OCA's witness measured Pennsylvania's percentage of peak demand contributed to the FE-ATSI system in the summer of 2018, which was approximately 7.20 percent. Id. Accordingly, Pennsylvania would likely experience approximately $1.8 million in increased wholesale power prices from the FE-ATSI Transmission Zone for the first fifteen years of the IEC Project's service life, or 7.20 percent of the FE-ATSI zone's detriment.

from third parties, but consideration of solutions is only limited to those proposals. Transource St. 7-R at 27-28. PJM does not itself identify the most reasonable solution to a congestion issue. Tr. at 2272-73. As the record shows, however, reasonable alternatives do exist and legislative and policy initiatives are underway in the affected regions that will further obviate the need for this Project.[10] Accordingly, the Company has failed to demonstrate that the IEC Project is the most reasonably available alternative to address congestion on the AP South Reactive Interface, if one is needed at all.

Finally, the Company belatedly claims that failure to construct the IEC Project will result in ***potential*** future reliability violations occurring in 2023. Transource St. 7-R at 21. The IEC Project, however, was specifically designed to address congestion on the AP South Reactive Interface. See Transource St. 3 at 24, Transource St. 8-R, Exh. TH-5R at 2. It was not, and never has been, proposed to address reliability concerns. See OCA St. 2-SSR at 16-17; see also Tr. at 2926. Additionally, the Company's evidence demonstrating these reliability concerns relies upon a single generation deliverability test performed by PJM in 2018. OCA St. 2-SSR at 16-17. PJM did not perform its full suite of reliability tests to confirm that these reliability violations will result in 2023. Id. Moreover, PJM has not performed another generation deliverability test since 2018. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-10. This is concerning because numerous improvements are being made to the electric grid involving some of those same facilities that were identified as potentially overloading in 2023 in the absence of the IEC Project. See Transource St. AA-2, Exh. SRH-AA2 at 14-17. Further, the transmission system in all areas is dynamic and changing rapidly. Accordingly, if the IEC Project is denied and assuming these

[10] See Section VI.E.2 of the OCA's Brief.

potential future reliability violations still exist, the appropriate remedy to these concerns is through PJM's normal RTEP process.

For the reasons above, the OCA submits that the Commission should deny the Company's Applications to construct the IEC Project. The Company has failed to demonstrate that this Project is needed to address congestion on the AP South Reactive Interface. Moreover, in light of the extensive environmental impacts to Pennsylvania and the existence of other potential non-wires solutions, the Company has failed to demonstrate that the IEC Project will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives. Accordingly, the IEC Project does not meet the standards set forth under the Constitution and Statutes of Pennsylvania, or the Commission's regulations.

## IV. BURDEN OF PROOF

Under Section 332 of the Public Utility Code, the proponent of a rule or order in any Commission proceeding has the burden of proof. 66 Pa. C.S. § 332. As it seeks an order approving its Applications, Transource has the burden of proof in the instant case. To that end, Transource must demonstrate that it has met all of the requirements under the Commonwealth's Constitution, Statutes, and the Commission's regulations to the extent they are applicable in this matter. Pa. Const., Art. 1, § 27, 66 Pa. C.S. §§ 1101, 1102(a)(1), 1103; 52 Pa. Code §§ 57.75, 57.76.

The Pennsylvania Supreme Court has also held that the party with the "burden of proof" has a duty to establish material facts by a preponderance of the evidence. Se-Ling Hosiery, Inc. v. Margulies, 70 A.2d 854, 857 (Pa. 1950). The "preponderance of the evidence" means that one party has presented evidence that is more convincing than the evidence presented by the other party. Id., 70 A.2d at 856.

## V. APPLICABLE LEGAL STANDARD

### A. CONSTITUTIONAL LAW

In analyzing the siting and construction of high voltage transmission lines, the Commission must be guided by the Environmental Rights Amendment codified as Article 1, Section 27 of the Pennsylvania Constitution. The Environmental Rights Amendment protects the rights of Pennsylvanians to clean air, pure water, and the preservation of the environment, while also requiring the Commonwealth to conserve and maintain the public's natural resources for the benefit of all Pennsylvanians. Article 1, Section 27 states in full:

> The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

Pa. Const., Art. 1, § 27. Indeed, these constitutional rights are the basis for the regulatory framework the Commission promulgated for the review of high-voltage transmission lines. Re Proposed Electric Regulation, 49 Pa. PUC 709, 712 (Mar. 2, 1976).[11]

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[11] The following is an excerpt from the Commission's Order:

> Therefore, the Commission is proposing a regulation which will provide for Commission review of the siting and construction of overhead electric transmission lines.
>
> * * *
>
> [R]ecent Pennsylvania appellate court decisions indicate that the Commission, when considering whether to grant or deny certification authorizing the exercise of eminent domain, has a constitutional responsibility pursuant to Article I, Section 27 of the Constitution of Pennsylvania to ensure the protection of the environment whenever the issue of damage to the environment is raised. This constitutional responsibility is met when the Commission determines that all applicable statutes and regulations relevant to the protection of the environment have been complied with, that a reasonable effort has been made to reduce the impact on the environment to a minimum, and that the environmental harm is clearly outweighed by the benefits to be derived from the facilities to be constructed. The Commission takes notice of the fact that overhead electric transmission lines cannot be constructed without some adverse effect upon the environment. Therefore, the review required by Article I, Section 27 is being incorporated into our siting regulation.

Id., at 710-712 (citations omitted).

Until recently, the Commonwealth's obligations in preserving the environment were further expressed in a three-part test established by the Commonwealth Court in the case of Payne v. Kassab, in which the Court stated:

> The court's role must be to test the decision under review by a threefold standard: (1) Was there compliance with all applicable statutes and regulations relevant to the protection of the Commonwealth's public natural resources? (2) Does the record demonstrate a reasonable effort to reduce the environmental incursion to a minimum? (3) Does the environmental harm which will result from the challenged decision or action so clearly outweigh the benefits to be derived therefrom that to proceed further would be an abuse of discretion?

11 Pa. Commw. 14, 29-30, 312 A.2d 86, 94 (Pa. Commw. Ct. 1973) (Payne). The Commission used identical language in its Orders promulgating the regulations for the review of high-voltage transmission lines. See fn. 1, supra.

In PEDF, the Supreme Court of Pennsylvania overturned this test stating "[t]he Payne I test, which is unrelated to the text of Section 27 and the trust principles animating it, strips the constitutional provision of its meaning." 161 A.3d at 930. In replacing the Payne standard, the Court outlined three principle contours of Article I, Section 27, which must guide any analysis. Id. As stated by the Court:

> This constitutional provision grants two separate rights to the people of this Commonwealth. The first right is contained in the first sentence, which is a prohibitory clause declaring the right of citizens to clean air and pure water, and to the preservation of natural, scenic, historic and esthetic values of the environment. This clause places a limitation on the state's power to act contrary to this right, and while the subject of this right may be amenable to regulation, any laws that unreasonably impair the right are unconstitutional.
>
> The second right reserved by Section 27, set forth in its second sentence, is the common ownership by the people, including future generations, of Pennsylvania's public natural resources…In a statement offered to the General Assembly in connection with the proposed Environmental Rights Amendment, Professor Robert Broughton explained that the provision was initially drafted as "Pennsylvania's natural resources, including the air, waters, fish, wildlife, and the public lands and property of the Commonwealth ...." but was revised to remove the enumerated list and thereby discourage courts from limiting the scope of natural resources covered.

> The third clause of Section 27 establishes a public trust, pursuant to which the natural resources are the corpus of the trust, the Commonwealth is the trustee, and the people are the named beneficiaries. The terms "trust" and "trustee" carry their legal implications under Pennsylvania law at the time the amendment was adopted. Notably, Professor Broughton explained that the Commonwealth's role was plainly intended to be that of a "trustee," as opposed to "proprietor." As a trustee, the Commonwealth must deal "with its citizens as a fiduciary, measuring its successes by the benefits it bestows upon all its citizens in their utilization of natural resources under law." Under Section 27, the Commonwealth may not act as a mere proprietor, pursuant to which it "deals at arms[']  length with its citizens, measuring its gains by the balance sheet profits and appreciation it realizes from its resources operations."

PEDF, 161 A.3d 911, 931-32 (internal citations omitted).

The Court in PEDF corrects the approach taken when analyzing a governmental action that may infringe upon the environmental rights of Pennsylvanians. Composed of two separate principles, the PEDF decision first opines that that there is a prohibitory clause declaring the right of citizens to clean air and pure water, and to the preservation of the natural, scenic, historic, and esthetic values of the environment. PEDF, 161 A.3d at 931. The second and third clauses create a trust wherein the public natural resources are the corpus of that trust, the Commonwealth the trustee, and Pennsylvanians the named beneficiaries. Id.[12] Moreover, these constitutional obligations bind all government, state and local, concurrently. Frederick v. Allegheny Twp. Zoning Hearing Bd., 196 A.3d 677, 694 (Pa. Commw. Ct. 2018) (Frederick).

With respect to the first clause of the Environmental Rights Amendment, the prohibitory clause, the right to ‘clean air’ and ‘pure water’ sets plain conditions by which the government must abide. Robinson Twp. v. Commonwealth, 83 A.3d 901, 953 (Pa. 2013) (Robinson). Similarly, the prohibitory clause requires the preservation of broad environmental values thereby protecting the people from governmental action that unreasonably causes actual or likely deterioration of

[12] Robinson Twp. v. Commonwealth, 83 A.3d 901, 953 (Pa. 2013) (“Within the public trust paradigm of Section 27, the beneficiaries of the trust are ‘all the people’ of Pennsylvania, including generations yet to come.”)

these features. Id. Importantly, the Supreme Court of Pennsylvania opined that these rights "may be amenable to regulation," but that any governmental actions that "unreasonably impair the right are unconstitutional." PEDF, 161 A.3d at 931 (emphasis added).

The courts of Pennsylvania have provided additional guidance on when these rights may be amenable to regulation. As stated by the Supreme Court, the "economic well-being of the citizenry obviously is a legitimate state interest," and the Court did not perceive Section 27 as a way to deprive persons of the use of their property or to "derail development leading to an increase in the general welfare, convenience, and prosperity of the people." Robinson, 83 A.3d at 953-54. The Court, however, also recognizes that the rights "delineated in the first clause of Section 27 presumptively is on par with, and enforceable to the same extent as, any other right reserved to the people in Article I." Robinson, 83 A.3d at 953-54. Accordingly, to "achieve recognition of the environmental rights enumerated in the first clause of Section 27 as 'inviolate' necessarily implies that economic development cannot take place at the expense of unreasonable degradation of the environment." Id. at 954. Under this standard, the Government must refrain from permitting the degradation of these rights by private parties where such degradation is unreasonable, does not further a legitimate state interest, or does not benefit the citizens of this Commonwealth.[13]

With respect to the Environmental Rights Amendment's creation of a trust, the Government has the obligation to conserve and maintain the public's natural resources for the benefit of all the people, both present and future generations. In other words, the Commonwealth has the duty to prohibit and remedy, "degradation, diminution, and depletion of our public natural

[13] A dissenting opinion in a Commonwealth Court appeal has articulated that a strict scrutiny analysis shall apply to government actions that infringe upon Pennsylvanians' right to pure air, clean water, and the preservation of the environment. Frederick, 196 A.3d at 707-08, fn. 11 (McCullough, P., dissenting) (opining that where an ordinance burdens, infringes, or significantly interferes with a fundamental constitutional right, *i.e.* the Environmental Rights Amendment, strict scrutiny analysis is applicable, and the burden shifts to the government to prove that the ordinance furthers a compelling interest and is narrowly tailored to achieve that interest). As this is still an unresolved question, the OCA limits its analysis to the precedential decisions issued by the Supreme Court of Pennsylvania.

resources, whether these harms might result from direct state action or from the action of private parties." PEDF, 161 A.3d at 933. Moreover, "[a]s a fiduciary, the Commonwealth has a duty to act toward the corpus of the trust – the public natural resources – with prudence, loyalty and impartiality." Id., at 932. That is, the Commonwealth must exercise such care and skill as a person of ordinary prudence would exercise when dealing with their own property. PEDF, 161 A.3d at 932.

Prior case law further expands on the contours of these trust principles. Indeed, public natural resources is a broad term, which extends not only to "state-owned lands waterways, and mineral reserves, but also resources that implicate the public interest, such as ambient air, surface and ground water, wild flora, and fauna (including fish) that are outside the scope of purely private property." Robinson, 83 A.3d 955. Additionally, as is the case with the prohibitory clause, the trust clauses are not intended to prevent any development of the public natural resources, but such use must be "legitimate development tending to improve upon the lot of Pennsylvania Citizenry, with the evident goal of promoting sustainable development." Robinson, 83 A.3d at 958. Moreover, the generational aspect of the trust creates an added dimension for consideration. As explained by the Supreme Court of Pennsylvania:

> The second, cross-generational dimension of Section 27 reinforces the conservation imperative: future generations are among the beneficiaries entitled to equal access and distribution of the resources, thus, the trustee cannot be short-sighted. Moreover, this aspect of Section 27 recognizes the practical reality that environmental changes, whether positive or negative, have the potential to be incremental, have a compounding effect, and develop over generations. The Environmental Rights Amendment offers protection equally against actions with immediate severe impact on public natural resources and against actions with minimal or insignificant present consequences that are actually or likely to have significant or irreversible effects in the short or long term.

See Id., at 959 (citations omitted).

These constitutional protections are directly implicated in this proceeding. The construction of electric transmission facilities, particularly Greenfield transmission facilities, will inexorably entail degradation of the natural, scenic, historic, and esthetic values of the environment, as well as the public's natural resources. This is evidenced through numerous instances of testimony of the citizens in the affected regions, as well as detailed thoroughly in the Company's siting studies. For example, the transcript in this proceeding is replete with references to the impacts to the rural community of Franklin County. Here is an excerpt from Katie Hess, the Director of the Landscape Conservation Initiative in the Franklin County region called South Mountain Partnership:

> Most of the proposed project is sited through land used for agricultural production. Approximately one-quarter of the project, as proposed in Pennsylvania, would pass through Franklin County Agricultural Security Areas. More than six miles would cut through 13 high value farmland parcels totaling over 1,655 acres. An additional one mile of the proposed project would bisect three publicly preserved farms totaling over 261 acres. These publicly preserved farms are farms on which the landowner has taken legal action to ensure the permanent preservation of that land under state and county funded preservation programs.
>
> Agricultural Security Area and preserved farmland affected in each municipality follows: Greene Township, 12,621 feet of proposed transmission line through publicly preserved farmland and Agricultural Security Areas. Associated high value farmland affected by that, 430 acres. Guilford Township, 9,072 feet of proposed transmission line, affecting over 564 associated high value farmland acres. Quincy Township, 14,985 feet of proposed line, affecting over 795 acres of high value farmland. Washington Township, over 1,176 feet of proposed line, affecting over 127 acres of high value farmland. These are only acres of preserved or Agricultural Security land affected. This does not account for everything else.

Tr. at 462-63. Ms. Hess would continue to explain the direct impacts the IEC Project would cause to Franklin County's natural resources:

> Now, natural resources. The natural resources that would be negatively affected by the project include high-quality soils and terrain, which have been previously discussed, high-quality water, and high-quality plant and wildlife habitats. The proposed route crosses at least half of Franklin County's stream segments identified by Pennsylvania Fish and Boat Commission in 2017 as Class A wild Trout Waters, a designation that confirms the stream's rare ability to support rare populations of

> naturally-produced trout of sufficient size and abundance to support a long-term and rewarding sport fishery. Going back again to tourism, recreational tourism development.
>
> The route also crosses several of the county's conservation greenways, wetlands, and floodplains, which serve valuable environmental services, including water catchment and treatment, wildlife habitat areas, and as service corridors that are currently being developed with recreational trails.

Tr. at 118. As further expressed by Ms. Shockey, the President and CEO of Allison-Antrim Museum in Greencastle, Franklin County is a historical community that will be heavily impacted by the IEC Project:

> The proposed overhead electric lines, if approved by the Pennsylvania Utility Commission, will go through prime agricultural land. Agriculture is Pennsylvania's number one industry. Franklin County will lose major income dollars from agriculture.
>
> We will no longer have the Cumberland Valley view shed, which the people of Franklin County have cherished, enjoyed, and admired for almost three centuries, since the early 1730s when the first white women and men came to Antrim Township. Our ancestors settled here because it reminded them of their homelands in Northern Ireland and Germany.
>
> To corroborate my statement, the following was written 107 years ago on August 14, 1911, by John Diehl Shull of Marion, PA, to his sister Viola in Michigan: "Dear Viola, it is a very foggy morning here at Marion. You seldom have such fogs as this in Michigan. The mountain views, which are one of our principal assets here, do not count today for you cannot see anything that is more than a quarter mile away."
>
> Tourism is Pennsylvania's number 2 industry. Franklin County will lose major income dollars from lower tourism numbers due to the ruined Cumberland Valley view shed by the 135 feet tall overhead electric lines. This is important not just to all of us here, those behind me, but our children, our grandchildren, and every generation to come.

Tr. at 823-24. Such impacts were also confirmed by Company witness Baker who oversaw the completion of the siting study. Tr. at 2152-56.

Undoubtedly, the constitutional rights of Pennsylvanians are implicated in this proceeding and the Commission must ensure that it fulfills its constitutional obligations in light of the PEDF

decision. Indeed, under PEDF, the OCA submits that the Company has a heavy burden to demonstrate that its meets these constitutional requirements.

B. STATUTORY LAW

The General Assembly has delegated authority to the Commission to approve the siting and construction of aerial electric transmission wires and substations by enacting several enabling statutes. There are several sections of Pennsylvania statutory law that provide this authority. The OCA will explain each separately.

1. Public Utility Code

Section 1501 of the Public Utility Code requires every public utility to furnish reasonable and adequate service and facilities. The provision states in part:

> **§ 1501. Character of service and facilities.**
>
> Every public utility shall furnish and maintain adequate, efficient, safe, and reasonable service and facilities, and shall make all such repairs, changes, alterations, substitutions, extensions, and improvements in or to such service and facilities as shall be necessary or proper for the accommodation, convenience, and safety of its patrons, employees, and the public. Such service also shall be reasonably continuous and without unreasonable interruptions or delay. Such service and facilities shall be in conformity with the regulations and orders of the commission…

66 Pa. C.S. § 1501. This provision grants the Commission the authority to review a utility's facilities and determine whether changes are needed to ensure safe, adequate and reliable service to the public. Furthermore, a regulated utility cannot make the regulated upgrades unless it can show that the project is necessary or proper for the accommodation, convenience, and safety of its patrons. Indeed, the Commonwealth Court held that this statute is one of two that provides the basis for the ultimate statutory determination that must be made when reviewing high-voltage transmission facilities. Pa. Power & Light Co. v. Pa. Pub. Util. Comm'n, 696 A.2d 248, 250 (Pa. Commw. Ct. 1997).

2. Exercise of Eminent Domain

Under Section 1511 of the Business Corporation Law of 1988, a public utility may condemn property to provide electricity to or for the public. It states in relevant part:

> **§ 1511. Additional powers of certain public utility corporations.**
>
> (a) General Rule. -- A public utility corporation shall … have the right to take, occupy and condemn property for one or more of the following principal purposes and ancillary purposes reasonably necessary or appropriate for the accomplishment of the principal purposes:
>
> * * *
>
> (3) The … transmission … distribution or furnishing of … electricity … to or for the public.

15 Pa. C.S. § 1511(a)(3). Before a public utility may exercise its statutorily granted authority to condemn property for the purpose of erecting poles and running wires for high-voltage transmission lines, it must obtain a finding from the Commission that such construction is necessary or proper for the service, accommodation, convenience, or safety of the public. 15 Pa. C.S. § 1511(c). As stated in more detail:

> **§ 1511. Additional powers of certain public utility corporations.**
>
> **(c)** ***Public Utility Commission approval.* —** The powers conferred by subsection (a) may be exercised to condemn property outside the limits of any street, highway, water or other public way or place for the purpose of erecting poles or running wires or other aerial electric, intrastate aerial telephone or intrastate aerial telegraph facilities only after the Pennsylvania Public Utility Commission, upon application of the public utility corporation, has found and determined, after notice and opportunity for hearing, that the service to be furnished by the corporation through the exercise of those powers is necessary or proper for the service, accommodation, convenience or safety of the public. The power of the public utility corporation to condemn the subject property or the procedure followed by it shall not be an issue in the commission proceedings held under this subsection, and no court shall entertain any proceeding questioning the jurisdiction of the commission under this subsection. A final order of the commission approving or denying an application under this subsection, including an order involving a question of jurisdiction under this subsection, may be made the subject of any appeal in the manner provided or prescribed by law.

Id.

Most recently, in 2018, the General Assembly passed Act 45 of 2018, establishing an additional requirement for the use of eminent domain over land subject to conservation easements. P.L. 345, No. 45. It states as follows:

> **§ 208. Eminent domain of land subject to conservation easement.**
>
> (a) Approval required.--Except as provided in subsection (g), no political subdivision, authority, public utility or other body having or exercising powers of eminent domain shall condemn any land subject to a conservation easement for any purpose, unless prior approval has been obtained from the orphans' court of the county in which the land is located. The condemnation approval specified by this subsection shall not be required for an underground public utility facility that does not permanently impact the open space benefits protected by the conservation easement. The condemnation approval specified by this subsection shall not be required for any public utility facility or other project that is subject to approval by a Federal agency, the necessity for the propriety and environmental effects of which has been reviewed and ratified or approved by the Pennsylvania Public Utility Commission or the Federal Energy Regulatory Commission, regardless of whether the right to establish and maintain such underground or other public utility facility is obtained by condemnation or by agreement with the owner.

26 Pa. C.S. § 208.[14] In other words, for the siting and construction of utility facilities that impair open space benefits of any land subject to a conservation easement, such as a high-voltage transmission line, the utility shall seek approval from the Orphans Court of the county in which the land is located.[15]

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[14] Conservation easement is defined as a "nonpossessory interest of a holder in real property, whether appurtenant or in gross, imposing limitations or affirmative obligations, the purposes of which include, but are not limited to, retaining or protecting for the public and economic benefit the natural, scenic or open space values of real property; assuring its availability for agricultural, forest, recreational or open space use; protecting, conserving or managing the use of natural resources; protecting wildlife; maintaining or enhancing land, air or water quality or preserving the historical, architectural, archaeological or cultural aspects of real property." 26 Pa. C.S. § 202, see also P.L. 390, No. 29, Section 3.

[15] The IEC Project is not subject to federal approval. See 16 U.S.C. § 824p(b)(1); see also U.S. DEPARTMENT OF ENERGY, NATIONAL ELECTRIC TRANSMISSION CONGESTION STUDY, Executive Summary at xix, https://www.energy.gov/oe/downloads/2015-national-electric-transmission-congestion-study (2015) (determining that it was not necessary to designate the northeast corridor as a national interest electric transmission corridor (NIETC)).

3. Standards for Approval of the Siting of Substation Control Equipment Buildings

Lastly, Section 619 of the Municipalities Planning Code (MPC), 53 P.S. § 10619, provides the standard for approval of the siting and construction of a public utility 'building,' such as a substation control equipment building. Section 619 states in relevant part:

> This article shall not apply to any existing or proposed building, or extension thereof, used or to be used by a public utility corporation, if, upon petition of the corporation, the Pennsylvania Public Utility Commission shall, after a public hearing, decide that the present or proposed situation of the building in question is reasonably necessary for the convenience or welfare of the public. It shall be the responsibility of the Pennsylvania Public Utility Commission to ensure that both the corporation and the municipality in which the building or proposed building is located have notice of the hearing and are granted an opportunity to appear, present witnesses, cross-examine witnesses presented by other parties and otherwise exercise the rights of a party to the proceedings.

53 P.S. § 10619. Accordingly, a public utility building that is reasonably necessary for the convenience or welfare of the public is exempt from local zoning ordinance provisions under the MPC. Del-AWARE Unlimited, Inc. v. Pa. PUC, 513 A.2d 593, 596 (Pa. Commw. Ct. 1986).

C. REGULATORY FRAMEWORK

Pursuant to its enabling statutes, the Commission promulgated regulations setting forth the regulatory requirements for approval to construct high-voltage transmission facilities. The Commission's regulations were based on the Payne standard, a now overruled interpretation of the Commonwealth's constitutional obligations under the Environmental Rights Amendment. Accordingly, the Commission must ensure that its constitutional obligations are fulfilled and that its regulations are applied in a manner consistent with PEDF.

Pursuant to the Commission's authority under 66 Pa. C.S. Section 1501, 15 Pa. C.S. Section 1511, and the Environmental Rights Amendment, the Commission promulgated regulations for the siting and construction of high-voltage transmission lines codified at Chapter 57, Subchapter

G, of Title 52 of the Pennsylvania Code. 52 Pa. Code §§ 57.71-57.77.[16] Section 57.71 of the Commission's Regulations states as follows:

> **§ 57.71. Application.**
>
> Upon the application of a public utility for authorization to locate and construct a HV transmission line or any portion thereof, upon approval of the application by the Commission first had and obtained, and upon compliance with existing laws, it shall be lawful for a public utility to commence construction of the HV transmission line or portion thereof.

52 Pa. Code § 57.71. The form and content of the application is codified at Section 57.72, which sets forth the necessary information that must be produced at the time of submission. 52 Pa. Code § 57.72. Additionally, the Commission issued a policy statement at Sections 69.3101 – 69.3107 of the Commission's regulations requesting additional information when submitting an application for approval. 52 Pa. Code §§ 69.3101 – 69.3107. This includes, among other things, information concerning route evaluation and siting criteria, as well as health and safety considerations. Id.

The Commission's regulations also set forth the criteria that must be met before a high-voltage transmission line is approved:

> **§ 57.76. Determination and order.**
>
> **(a)** The Commission will issue its order, with its opinion, if any, either granting or denying the application, in whole or in part, as filed or upon the terms, conditions or modifications, of the location, construction, operation or maintenance of the line as the Commission may deem appropriate. The Commission will not grant the application, either as proposed or as modified, unless it finds and determines as to the proposed HV line:
>
> **(1)** That there is a need for it.
>
> **(2)** That it will not create an unreasonable risk of danger to the health and safety of the public.

[16] The Commission's Regulations define a high-voltage line as "an overhead electric supply line with a design voltage greater than 100,000 volts" or 100 kilovolts (kV). 52 Pa. Code § 57.1.

> **(3)** That it is in compliance with applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth.
>
> **(4)** That it will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives.

52 Pa. Code § 57.76. Pursuant to Section 57.76, the Commission must ensure that all criteria are met before it may approve the siting and construction of high-voltage transmission facilities. To that end, the Commission will accept evidence and consider the following:

> **§ 57.75. Hearing and notice.**
>
> (e) At hearings held under this section, the Commission will accept evidence upon, and in its determination of the application it will consider, inter alia, the following matters:
>
> (1) The present and future necessity of the proposed HV line in furnishing service to the public.
>
> (2) The safety of the proposed HV line.
>
> (3) The impact and the efforts which have been and will be made to minimize the impact, if any, of the proposed HV line upon the following:
>
> (i) Land use.
> (ii) Soil and sedimentation.
> (iii) Plant and wildlife habitats.
> (iv) Terrain.
> (v) Hydrology.
> (vi) Landscape.
> (vii) Archeologic areas.
> (viii) Geologic areas.
> (ix) Historic areas.
> (x) Scenic areas.
> (xi) Wilderness areas.
> (xii) Scenic rivers.
>
> (4) The availability of reasonable alternative routes.

52 Pa. Code § 57.75(e)(1-4).

The Commission, in a recent transmission siting proceeding, has interpreted the above regulations as being consistent with its constitutional obligations under the PEDF standard. Application of Pennsylvania Electric Company Seeking Approval to Locate, Construct, Operate and Maintain a High-Voltage Transmission Line Referred to as the Bedford North-Central City West 115 kV HV Transmission Line Project, Docket No. A-2016-2565296, et al., Opinion and Order at 14 (Pa. PUC Mar. 8, 2018) (noting that the evidentiary record in that proceeding had closed prior to the PEDF decision) (Bedford North-Central City West 115 kV). The Commission stated as follows:

> We conclude that the evidentiary record in this proceeding, the process used to evaluate it, and the approval of this project are fully consistent with the Environmental Rights Amendment and the Supreme Court's opinion in *PEDF*.

Id. The Commission further stated that:

> The Commission's regulatory scheme for high-voltage line transmission siting cases, therefore, provides for a robust, evidence-based deliberative process that provides due process for all interested parties. The Commission, consistent with our role as a fiduciary responsible for the preservation of the Commonwealth's natural resources, and consistent with *PEDF*, acts with prudence, loyalty and impartiality when adhering to these regulations. In this manner, we fulfill our responsibility to protect the public's natural resources from depletion or degradation, while also allowing legitimate development that improves the lot of Pennsylvania's citizenry, as the Pennsylvania Supreme Court recognized in *Robinson Township v. Com. of Pa.*, 623 Pa. 564, 658, 83 A.3d 901, 958 (2013).

Id. (emphasis added).

Accordingly, in light of PEDF, the Commission's regulations require more than a mere balancing of the harms and benefits derived from the IEC Project. Rather, the Commission must give strong consideration to the environmental harms caused by the IEC Project and available alternatives. Moreover, a more rigorous proof of need, or necessity, is required in order to approve a transmission project. Indeed, the Company carries a heavy burden to demonstrate that a market efficiency project designed to alleviate economic congestion for load-serving entities

predominantly in Virginia and Maryland is sufficient to impose the environmental burdens that will be experienced by Pennsylvania. As the OCA will demonstrate, the Company has failed to meet its burden of proof under both PEDF and the Commission's current high-voltage transmission siting regulations.

## VI. ARGUMENT

### A. INTRODUCTION

The OCA submits that the Company has not met its burden of proof in this proceeding and the Commission should deny the Company's Applications. The Company has failed to demonstrate that the IEC Project is necessary to maintain adequate, efficient, safe, and reasonable service and facilities. 66 Pa. C.S. § 1501. That is, the Company has not shown that the IEC Project is needed, that it will not create an unreasonable risk of danger to the health and safety of the public, that it provides for the protection of the natural resources of this Commonwealth, and that it will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives. 52 Pa. Code § 57.76(a)(1-4).

To the extent the OCA does not address an issue in this brief, it should not be considered an acceptance of the Company's position. The OCA sets forth the following in support of its position:

### B. NEED FOR THE PROJECT

#### 1. Introduction

The Commission has stated that need is the threshold issue for approval of the siting and construction of high-voltage transmission lines – that is the Commission must find that there is a need for the Project before the rest of the application is evaluated. The Commonwealth Court has held that the standard for need is synonymous with the standards set forth in 15 Pa. C.S. Section

1511 and 66 Pa. C.S. Section 1501. In other words, is the construction of the IEC Project necessary or proper for the accommodation, convenience, or safety of its patrons, employees, and the public? See 15 Pa. C.S. § 1511, 66 Pa. C.S. § 1501.

The OCA submits that Transource has failed to show that the IEC Project is needed in accordance with Pennsylvania law. The AP South Reactive Interface congestion, which resulted in the IEC Project, no longer exists to the same extent as when the Project was proposed. Moreover, PJM's benefit-cost analysis, which the Company relies on for approval of the IEC Project, is insufficient for several reasons. For one, PJM's benefit-cost methodology fails to take into consideration the detrimental effects caused by the IEC Project to the PJM region. Additionally, PJM's benefit-cost methodology is highly dynamic, changing often as a result of changes to the methodology proposed by PJM before FERC, either to the way benefits are calculated or to the parameters modeled in the simulation. These changes, along with the unpredictability of PJM's simulations, raises concerns about the true impact of the IEC Project and should be given little weight by this Commission.

Based on PJM's most recent simulation, if this Project is approved the PJM region as a whole will experience an increase of more than $812.5 million in wholesale power prices compared to the $845 million in purported benefits. Pennsylvania load-serving entities in particular will experience an increase of more than $400 million in wholesale power prices. Moreover, states that will experience a decrease in wholesale power prices, *i.e.* Virginia, Maryland, and Washington D.C., must also pay for the cost to build the IEC Project for many years to come, thereby curtailing any resulting benefit. For these reasons, the Company has failed to demonstrate that the IEC Project is needed.

2. Legal Background

Pursuant to Section 57.76 of the Commission's Regulations, the Commission will not approve the siting and construction of high-voltage transmission lines unless it finds and determines, among other criteria, that there is a **need** for it. 52 Pa. Code § 57.76(a)(1) (emphasis added). The Commission has further held that need is the threshold issue which must be proven before the rest of the case is evaluated. Approval of the Siting and Construction of the Pennsylvania Portion of The Proposed Susquehanna-Roseland 500 kV Transmission Line in Portions of Lackawanna, Luzerne, Monroe, Pike and Wayne Counties, Pennsylvania, et al., Docket No. A-2009-2082652, et al., 2010 Pa. PUC LEXIS 434 at *35 (Pa. PUC Feb. 12, 2010) (Susquehanna-Roseland).

The term 'need,' however, is not defined in the Commission's Regulations or in the Commission's initial orders promulgating the transmission siting regulations. Id.; see also In Re: Application of Trans-Allegheny Interstate Line Company (TrAILCo) For approval: 1) for a certificate of public convenience to offer, render, furnish or supply transmission service in the Commonwealth of Pennsylvania; 2) authorization and to locate, construct, operate and maintain certain high-voltage electric substation facilities; 3) authority to exercise the power of eminent domain for the construction and installation of aerial electric transmission facilities along the proposed transmission line routes in Pennsylvania; 4) approval of an exemption from municipal zoning regulation with respect to the construction of buildings; and 5) approval of certain related affiliated interest arrangements, Docket No. A-110172, *et al.*, 2008 Pa. PUC LEXIS 60 at *127-129 (Rec. Dec. Aug. 15, 2008) (TrAILCo);

Numerous appeals have been brought before the Commonwealth Court of Pennsylvania to provide further parameters. In 1997, the Commonwealth Court issued a decision holding that the

standard for need is synonymous with the standards contained in Section 1501 of the Public Utility Code and Section 1511 of the Business Corporations Law – whether the facilities "shall be necessary or proper for the accommodation, convenience, and safety of its patrons, employees, and the public." Pa. Power & Light Co. v. Pa. Pub. Util. Comm'n, 696 A.2d 248, 250 (Pa. Commw. Ct. 1997) (holding that it was improper for the Commission to require an applicant to prove necessity from an 'engineering perspective'). In 2014, the Commonwealth Court recently held that the standard for 'need,' does not rise to the level of absolute necessity. Hess v. Pa. PUC, 107 A.3d 246, 260 (Pa Commw. Ct. 2014). Rather, the Commonwealth Court held that courts had found necessity wherever the project resulted in a benefit to the public. Id. Notably, in 2010, while the Commonwealth Court stated that regional reliability can be a proper basis for need under certain circumstances, the Court declined to address whether the reduction of congestion on its own is sufficient. Energy Conservation Council of Pa. v. Pa. PUC, 995 A.2d 465, 487 (Pa. Commw. Ct. 2010) (holding that it did not have to address whether congestion alone is a sufficient reason for need because the Commission properly determined that the Trans-Allegheny Interstate Line was needed on the basis of reliability and, secondarily, congestion) (TrAIL Appeal).

The Commission itself has issued several Opinions further defining what is sufficient for demonstrating need. For example, in 2013, the Commission approved PPL's proposal to construct the Northeast-Pocono Reliability Project, which consisted of a new 230 kV transmission line, approximately 58 miles in length, two new substations, and five new 138/69 kV transmission lines, altogether approximately 11.3 miles in length. Application of PPL Electric Utilities Corporation filed pursuant to 52 Pa. Code Chapter 57, Subchapter G, for approval of the siting and construction of transmission lines associated with the Northeast-Pocono Reliability Project in Portions of Luzerne, Lackawanna, Monroe, and Wayne Counties, Pennsylvania, et al., Docket No. A-2012-

2340872, 2014 Pa. PUC LEXIS 5 at *9, 38 (Pa. PUC Jan. 9, 2014) (Northeast-Pocono). In adopting the Recommended Decision, the Commission held that the project was needed to resolve violations of PPL's reliability criteria resulting from increased load and peak demand in the years preceding the project. Northeast-Pocono, 2013 Pa. PUC LEXIS 620 at *176-*177 (Rec. Dec. Oct. 8, 2013), aff'd 2014 Pa. PUC LEXIS 5 (Pa. PUC Jan. 9, 2014). For example, PPL experienced a 12 percent increase in peak load between 2003 and 2012 in the Northeast-Pocono area. Northeast-Pocono, 2013 Pa. PUC 620 at *177.

Similarly, the Commission approved PPL's Susquehanna-Roseland project, consisting of a double circuit 500 kV transmission line approximately 100 miles in length traveling through several Pennsylvania counties, as well as a new substation to connect the 500 kV line to the existing regional transmission system. Susquehanna-Roseland, 2010 Pa. PUC LEXIS 434 at *8, 100. The Commission found that in addition to resolving all relevant reliability violations for which the project was proposed, it also reduced congestion costs for the Pennsylvania region, including a $150 million reduction to the PPL electric transmission zone, and incorporated the modernization of approximately 28 miles of the Wallenpaupack-Bushkill segment thereby avoiding significant expenditures to replace the facilities as a standalone project. Id., at *64-68.

Comparatively, in 1980, the Commission denied West Penn Power's proposal to construct a Harrison-Prexy-Yukon 500 kV transmission line extending 38 miles from West Virginia to a proposed Prexy substation in Washington County and then 23.3 miles east to the Yukon substation. Re West Penn Power Company, Application Docket No. 100200, et al., 1980 Pa. PUC LEXIS 49 at *15-16. (Pa. PUC May 29, 1980). The Commission held that the combination of circumstances relied upon by West Penn Power in its load flow studies were incomplete, too remote and too

extreme to support its burden of proving need. Id., at *11. In addition, the Commission identified numerous errors in the Company's methodology. This included the following:

- West Penn had not updated its load forecast, where the most recent data indicated a de-accelerated growth in peak load;
- The load flows submitted failed to reflect additional generation that may become available to meet the forecasted peak loads when they occur;
- The peak load data included all the loads of interruptible customers, even though those loads could have been used to reduce the forecasted peaks;
- The assumption in the load flows that *only* the most economic generation would be used, even though overloads or outages caused by the double contingencies might easily be resolved if slightly more expensive generation were used.

Re West Penn Power Company, 1980 Pa. PUC LEXIS 49 at *5-10. Accordingly, the Commission held that West Penn Power failed to show that the proposed transmission project was needed to serve the public under the standards set forth in the Public Utility Code. Id., at *15-16.

These cases demonstrate, as noted in the Recommended Decision denying the Tran-Allegheny Interstate Transmission Line (TrAIL), that the "inquiry to determine whether a public need for a transmission project exists depends on the specific facts presented regarding each project and upon the future impacts or consequences within a broad context." TrAILCo, 2008 Pa. PUC LEXIS 60 at *127. Indeed, the scope of the inquiry is broad and includes consideration of many factors. Id., at *128-129.

While these past proceedings have refined the need determination, the Commission's obligations must be further understood in light of the Supreme Court's recent decision in PEDF. As stated by the Commission in Bedford North-Central City West 115 kV, the Commission must fulfill its responsibility to protect the public's natural resources from depletion or degradation, while also allowing legitimate development that improves the lot of Pennsylvania's citizenry.

Order at 14 (emphasis added). Accordingly, the Company has a heavy burden to demonstrate need.

3. Congestion on the AP South Reactive Interface, the Main Driver of the IEC Project has Greatly Diminished Over the Past Several Years.

PJM is a Regional Transmission Organization charged by FERC with ensuring the reliable and efficient operation of the electric transmission system that spans all or parts of thirteen states. To that end, PJM prepares an annual RTEP detailing a series of analyses to ensure reliable flow of electricity to its customers. The RTEP also includes a Market Efficiency Analysis, the sole purpose of which is to identify congestion constraints across its electrical grid that affect its economic efficiency and can increase prices on the wholesale market for certain customers. Congestion was explained by Transource witness McGlynn, testimony which was later adopted by Company witness Timothy Horger:

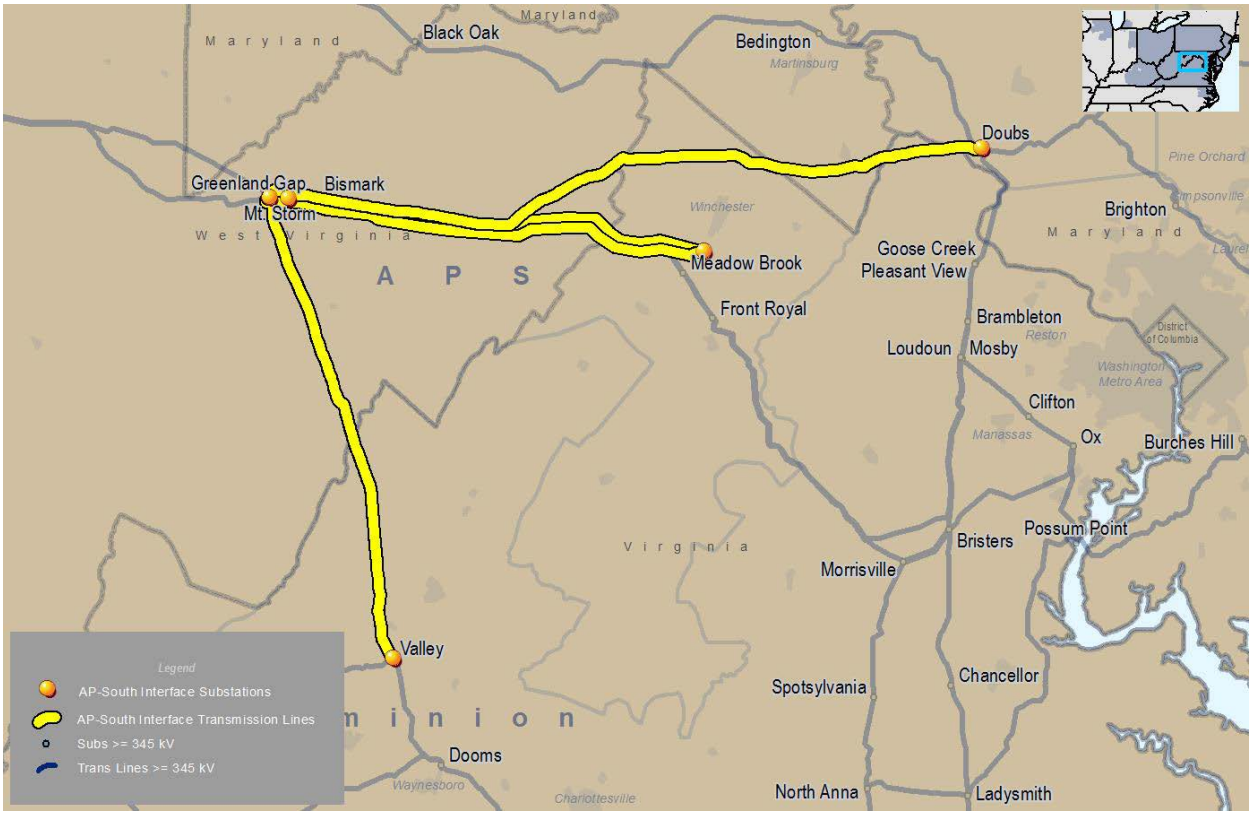
> Congestion occurs when the least costly resources that are available to serve load in a given region cannot be dispatched because transmission facility limits constrain power flow on the system. This is particularly true in PJM where power often flows from lower-priced generating resources in western zones to load centers in the East. The lowest-priced energy is often constrained rom flowing freely to those load centers. When this occurs, PJM's system operator must dispatch higher cost resources to serve load. This results in [Locational Marginal Pricing (LMP)] differences and congestion on the system. The congestion generally increases system production costs, LMPs, and results in increased customer payments for electric energy.

Transource St. No. 3 at 24.

Pursuant to PJM's implementation of FERC Order No. 1000, when congestion is identified on the bulk transmission grid PJM opens up a competitive selection process soliciting proposals from third parties to mitigate this congestion. Proposals can include the construction of aerial electric wires in existing rights-of-way, also known as brownfield construction, or the construction of aerial electric wires in presently unencumbered land, also known as Greenfield construction.

Pursuant to its Operating Agreement, PJM will approve market efficiency projects provided that the benefits exceed the costs by a ratio of at least 1.25:1.[17]

On October 30, 2014, PJM opened a long-term RTEP proposal window ("2014/2015 Long-Term Window") to solicit proposals to alleviate congestion on the AP South Reactive Interface, a set of four 500 kV transmission lines that originate in West Virginia and terminate in Maryland. See the following map for a visual representation.




Transource St. 8-R, Exh. TH-5R at 8.

Historically, prior to 2014, the AP South Reactive Interface had experienced a large amount of congestion costs on an annual basis. In other words, PJM was dispatching higher cost generation resources to the East and South of the AP South Reactive Interface as a result of operating

[17] Amended and Restated Operating Agreement of PJM Interconnection, L.L.C., PJM Interconnection, L.L.C. Rate Schedule FERC No. 24, Docket No. ER11-4040-000, Schedule 6, Section 1.5.7(d) https://www.pjm.com/directory/merged-tariffs/oa.pdf.

constraints. See the chart below for a yearly description of the congestion costs on the AP South Reactive Interface prior to 2014:

**AP South Reactive Interface Historical Congestion**

From Monitoring Analytics Reports

| | Cost Millions $ | % of Annual PJM Total Congestion Cost | Rank PJM | Event Hours Day Ahead | Event Hours Real Time |
|---|---|---|---|---|---|
| 2008 | $ 558.0 | 26.0% | 1 | 3,572 | 1,016 |
| 2009 | $ 206.5 | 29.0% | 1 | 3,501 | 604 |
| 2010 | $ 420.2 | 30.0% | 1 | 4,622 | 1,516 |
| 2011 | $ 238.9 | 24.0% | 1 | 4,111 | 1,013 |
| 2012 | $ 68.5 | 12.9% | 1 | 2,586 | 351 |
| 2013 | $ 169.1 | 25.0% | 1 | 6,330 | 1,138 |
| 2014 | $ 486.8 | 25.2% | 1 | 5,090 | 981 |

OCA St. 3 at 12. As seen in the chart above, every year prior to the opening of the 2014/2015 Long Term Proposal Window, the AP South Reactive Interface was the most congested facility in the entire PJM region. This historical congestion led PJM to seek solutions, of which forty-one were submitted during the 2014/2015 Long-Term Proposal Window. After PJM's review of each proposal, it selected the IEC Project for approval as a market efficiency project solely to address congestion on the AP South Reactive Interface. OCA St. 1 at 20.

Since the initiation of the 2014/2015 Long Term Proposal Window, however, congestion costs on the AP South Reactive Interface have decreased dramatically. The chart below from OCA witness Crandall shows congestion costs from 2015-2017:

**AP South Reactive Interface Historical Congestion**

From Monitoring Analytics Reports

| | Cost Millions $ | % of Annual PJM Total Congestion Cost | Rank PJM | Event Hours Day Ahead | Event Hours Real Time |
|---|---|---|---|---|---|
| 2015 | $ 56.2 | 4.1% | 6 | 1,285 | 42 |
| 2016 | $ 16.8 | 1.6% | 11 | 1,076 | 14 |
| 2017 | $ 21.6 | 3.1% | 6 | 1,315 | 74 |

OCA St. 3 at 12. In 2018, congestion on the AP South Reactive Interface was approximately $20.8 million.[18] In 2019, it was approximately $14.5 million. Tr. at 2921. As can be seen, actual congestion on the AP South Reactive Interface has decreased by over $450 million since 2014. Moreover, this trend is likely to continue into the future. As indicated by the most recent State of the Market Report published by PJM's Independent Market Monitor, congestion on the AP South Reactive Interface through the first quarter of 2020 was low enough that it was not listed as one of the top 25 congestion constraints in PJM. OCA Hearing Exh. No. 6 at 559.[19] For context, the lowest ranking constraint on that list was Prince George which accumulated $0.9 million of congestion costs through the first quarter of 2020. Id.

As OCA witness Lanzalotta explained, peak demand in the AP South Region has been decreasing. As stated by Mr. Lanzalotta:

> When the proposal for the IEC was submitted in 2015, the most recent summer peaks for BGE, Pepco, and Dominion were from 2014 and totaled 31,773 MW, as shown in Table 2. By 2017, these peak loads had decreased to 31,450 MW. These three companies represent the bulk of the loads in Maryland, DC and Virginia. The 2015 forecast of the projected summer peak loads for 2020 was 36,378 MW for these three companies. This was the peak load expected for the year in which the IEC would go into service. The 2018 forecast of the 2020 peak load for the three companies, at 33,016 MW, has dropped by more than 3,300 MW in the past three years. Such a continuing decrease in forecasted loads is likely to affect the level of congestion on transmission facilities and is likely to lower the value of reducing such congestion.

OCA St. 2 at 16 (footnotes omitted). OCA Witness Crandall also testified as follows:

> From 2008 through 2014, the AP South Reactive Interface ranked number one in PJM for congestion costs. This constraint was responsible for approximately one-fourth of PJM's total system-wide congestion costs, an average of $307 million per

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[18] See Monitoring Analytics, LLC, *2018 State of the Market Report for PJM* at 533, http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2018/2018-som-pjm-sec11.pdf (last visited Aug. 10, 2020).

[19] The Independent Market Monitor, or Monitoring Analytics, LLC, is responsible for promoting a robust, competitive and nondiscriminatory electric power market in PJM by implementing the PJM Market Monitoring Plan. Tr. at 2619.

> year. Beginning in 2015, the congestion cost dropped dramatically, averaging $31 million per year over the 2015-2017 period, which was less than 3% of PJM's total system-wide congestion costs over the 2015-2017 period. Current congestion costs are about a tenth of the congestion costs at the time PJM issued its 2014-2015 Long Term Proposal window from which the IEC Project was selected.
>
> Similarly, the congestion event hours on the AP South Reactive Interface also dropped precipitously beginning in 2015. The day ahead (Defined as a forward market in which PJM market participants buy and sell energy bids. Results are financially binding and are posted by 1:30 p.m. on the day before) congestion hours over the 2008-2014 period averaged 4,259 hours per year at the AP South Reactive Interface. This dropped to an average of 1,225-day ahead congestion hours per year for the 2015-2017 period.
>
> The same pattern exists for the real time (defined as the real time energy market in which clearing prices are calculated every five minutes based on actual system operations constrained economic dispatch) event hours on the AP South Reactive Interface. The real time congestion event hours averaged 946 hours per year for the 2008-2014 period. This dropped to an average of 43 real time congestion hours per year for the 2015-2017 period.

OCA St. 3 at 10-12 (footnotes omitted).

The evidence demonstrates that the economic efficiency problem identified in the 2014/2015 Long Term Proposal Window, which is the main driver of the IEC Project, has substantially diminished since the Project's inception.[20] Accordingly, the Company's evidence closely resembles that of Re West Penn Power Company where the Commission denied approval of the transmission project, in part, because the applicant failed to update its load forecast, which showed de-accelerated growth in future years. 1980 Pa. PUC LEXIS 49 at *5-6. Likewise,

[20] This trend has continued with the recent novel coronavirus (COVID-19) pandemic, which has caused major disruption to typical load patterns. See OCA Hearing Exhibit No. 3, Transource Response to OCA-XLVIII-1. As indicated by PJM, during March and April 2020, weekday peak loads were ranging anywhere between 6.5% and 15.2% lower than originally projected. Id., Att. at 5. This resulted from many businesses either closing temporarily or requiring work-from-home arrangements. Id. Accordingly, PJM indicates that its load forecast will be affected for the foreseeable future, likely not fully recovering until at least mid-2023. Id., Att. at 8-9. The Company has not run a simulation of the benefits of the IEC Project incorporating these changes in the load profile. OCA Hearing Exhibit No. 3, Transource Response to OCA-XLVIII-7. This is particularly alarming as evidence suggests that even a one percent decrease in the PJM region-wide load can substantially impact the benefits of the IEC Project. See Transource St. AA-3 at 3-4.

Transource relies on future data that is simulated, inflated, and unrealistic. Indeed, the Company has admitted on numerous occasions, that its analysis does not rely on or interpret actual, historical data. This is inappropriate and insufficient given the compelling changes in current conditions. In fact, the Company's witness, Mr. Horger, admits that wholesale power prices have reduced dramatically across the PJM region over the past ten years. Tr. at 2634. This evidence is also at odds with the Commission's decision in Northeast-Pocono, where PPL's proposed transmission project was approved after evidence indicated a 12 percent increase in peak load between 2003 and 2012 in the Northeast-Pocono area. 2013 Pa. PUC 620 at *177.

Clearly, the high levels of congestion that were the foundation of this market efficiency project have diminished and are not expected to return. The OCA submits the Company has not established that this market efficiency project is necessary to maintain adequate, efficient, safe, and reasonable service and facilities. 66 Pa. C.S. § 1501

4. PJM's Benefit-Cost Analysis is Flawed Because it Ignores the Negative Impacts of the IEC Project, the Methodology Has Changed Repeatedly Throughout the Proceeding, and is Highly Uncertain.

Transource, in its efforts to meet its burden of proof, relies heavily on the analysis and work product of PJM. Even assuming that there is a need to address congestion on the AP South Reactive Interface, PJM's benefit-cost analysis is flawed in several key respects containing serious and substantive deficiencies. Simply put, PJM's benefit-cost analysis cannot support a finding of need under Pennsylvania statutes, regulations, and constitutional standards.

First, PJM fails to consider the detrimental impacts of a market efficiency project when calculating the benefit-cost ratio because it does not include in its calculations transmission zones that will experience increased wholesale power prices. Thus, PJM's methodology leads to a significant overstatement in the benefits of a market efficiency project. Second, PJM changed its benefit-cost methodology either by altering the parameters and inputs used in the computer

simulation software or simply altering how the benefits and costs are calculated, which can dramatically alter the claimed benefits of a market efficiency project. Lastly, PJM's analysis demonstrating the impacts of the IEC Project has repeatedly changed throughout this proceeding such that the actual impact of the IEC Project is uncertain. After a brief recitation of PJM's present benefit-cost methodology, the OCA will address each issue in turn.

*a. Overview of PJM's Benefit-Cost Methodology*

Under its Operating Agreement, PJM can approve transmission system enhancements specifically designed to address congestion so long as it meets the following criteria:

> If new facilities can lower costs to customers, and benefits of the project exceeds its costs by or above a certain required ratio, then PJM has the authority to require new transmission to be built.

Transource St. 3 at 15. Specifically, the relative benefits and costs of the economic-based enhancement or expansion must meet or exceed a benefit/cost ratio of at least 1.25:1. Transource St. 7-R, Exh. SRH-3R at 11. If a proposal fails to meet this threshold, PJM does not consider the project economically viable or necessary. The purpose of this threshold is to prevent PJM from approving a market efficiency project that has net benefits of zero over a 15-year period. Transource St. 3 at 19.

Company witness McGlynn, whose testimony was adopted by Company witness Timothy Horger, testified that PJM calculates the benefit-cost ratio as follows:

> The Benefit/Cost ratio is calculated by dividing the present value of the total annual benefit for each of the first 15 years of the life of the enhancement or expansion by the present value of the total annual cost for each of the first 15 years of the life of the enhancement or expansion.

Transource St. 3 at 18-19.[21] The benefit metric of the IEC Project is solely based on the Net Load Payments (NLP) savings. See Transource St. 2 at 5. As explained by Company Witness Horger, net load payments are defined as the total amount load-serving entities in a specific transmission zone pay for power over a specified time period minus any currently outstanding financial hedges. Tr. at 2608-09. Furthermore, PJM only takes into consideration transmission zones that would see reduced net load payments or energy costs, excluding zones that see an increase in energy costs. See e.g. OCA Hearing Exhibit No. 1, Data Request OCA-II-15.

With respect to the cost portion of the benefit-cost ratio, PJM's RTEP process determines the cost of a transmission project based on the carrying charge for the capital cost of the project, discounted over 15 years, resulting in a present value of revenue requirements (PVRR) for the first 15 years of the useful life of the project.[22] OCA St. 1 at 10-11. For example, as stated by OCA Witness Rubin:

> Assume a project has a construction cost of $100, the carrying charge rate is 16.2%, and the discount rate is 7.8%. That would mean that the annual cost of the project is $16.20. The value of that in the first year is $16.20. The second year's carrying cost of $16.20 would be worth only $14.94 ($16.20 x (1 – 0.078)). The third year's cost would be worth only $13.77 in the first year, and so on. The sum of those discounted annual carrying charges for 15 years would be the PVRR of the project in the year the project goes into service.

OCA St. 1 at 11. The Project costs are likewise expected to be paid by the load-serving entities in those transmission zones that benefit from the Project. OCA St. 1 at 36.

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[21] PJM has since changed the forecast period of the benefits and costs of this project to more closely align with the RTEP planning horizon. See Transource Hearing Exh. 18. Rather than measure the benefits 15 years from the in-service date of the project, PJM now only calculates 15 years from the start of the RTEP planning horizon. Id., at 3. The most recent re-evaluation of the IEC Project measures the benefits over a 15-year period from 2023. See Transource St. AA-3, Exh. TJH-AA3.

[22] It is important to note that the IEC Project will recover its annual revenue requirement for the entire service life of the Project, which could last anywhere between 50 to 60 years. Tr. at 2118. PJM only forecasts benefits over a 15-year period and aligns the revenue requirement with that time frame.

Accordingly, the benefit-cost ratio as performed by PJM divides the benefits of a market efficiency project, in this case the total decrease in wholesale power prices across the PJM region (excluding any zones that experience an increase) discounted over a specified time period, by the sum of the annual revenue requirement discounted over that same time period.

*b. PJM's Benefit-Cost Methodology Does Not Consider Transmission Zones that will Experience an Increase in Wholesale Power Prices as a Result of the IEC Project.*

As stated above, PJM will only approve a market efficiency project if the benefits outweigh the costs of the project by a ratio of 1.25:1. In essence, for every dollar spent, PJM requires that the project realize at least $1.25 in benefits. The problem, however, is that PJM's calculation of the benefits of the IEC Project fails to include the detriments of the project. That is, PJM does not include in its calculation the increase in wholesale power prices that would occur in certain transmission zones as a result of the IEC Project. PJM's narrow focus on only certain transmission zones without consideration of the entire PJM region is insufficient for Pennsylvania standards of law and greatly overstates the purported economic benefit of the IEC Project.

The purpose of a benefit-cost analysis, it to attempt to capture the likely consequences of an activity and to express those consequences in the same units so that they can be compared. OCA St. 1 at 23. As OCA witness Rubin testified, E.J. Mishan provides a more complete definition in his textbook, *Cost-Benefit Analysis*:

> The general question that a cost-benefit analysis sets out to answer is whether a number of investment projects … should be undertaken and, if investible funds are limited, which one, or two, or more among these specific projects … should be selected. … What is wrong with deciding whether or not to undertake any specific investment, or to choose among a number of specific investment opportunities, guided simply by proper accounting practices and, therefore, guided ultimately by reference to profitability? The answer is provided by the familiar thesis that what counts as a benefit or a loss to one part of the economy – to one or more persons or groups – does not necessarily count as a benefit or loss to the economy as a whole. And in cost-benefit analysis we are concerned with the economy as a whole, with the welfare of a defined society, and not any smaller part of it.

OCA St. 1 at 23.

As stated by OCA witness Scott Rubin, PJM's analysis does not meet the requirements of a traditional benefit-cost analysis:

> Q. Does the so-called benefit-cost methodology required by PJM and used by Transource meet the requirements of a benefit-cost analysis?
>
> A. No. The PJM methodology used by Transource fails to capture all of the benefits and costs associated with the IEC Project.
>
> Q. How did you reach that conclusion?
>
> A. I reached that conclusion by reviewing the electronic spreadsheet model used by Transource to estimate the costs and benefits of the IEC Project, provided in response to OCA VI-2, as well as the Company's answers to other interrogatories. As I explain in more detail below, reviewing that information leaves no doubt that the PJM methodology ignores the negative consequences to utilities (and their customers) outside the region to be benefited. That is, when calculating the benefits of the IEC Project, Transource calculated the reduced power costs (primarily in MD-DC-VA) from being able to import lower-cost power into that region; but it failed to subtract from those benefits the higher costs that would result in other regions (including Pennsylvania) because they would no longer have the benefit of that same lower-cost power.

OCA St. 1 at 24. PJM's methodology violates the basic axiom of Professor Mishan's definition; namely, by failing to include in its analysis transmission zones that will experience an increase in wholesale power prices as a result of the IEC Project, PJM does not analyze the impact on the PJM region as a whole. Rather, it merely focuses on the beneficiaries and ignores all harmful effects. Thus, its analysis fails to fully encapsulate the impacts of the IEC Project.

This error is further exemplified in a simple data request as answered by a PJM employee:

> INTERROGATORY: For example, if a particular project results in energy costs to Zone A decreasing by $10 million and energy costs to Zone B increasing by $8 million, would the Change in Load Energy Payments for purposes of the cost-benefit analysis be $10 million or $2 million?
>
> RESPONSE: $10 Million.

OCA Sch. SJR-1. In other words, while the impact to the PJM region as a whole would be $2 million, PJM finds that the actual benefit is $10 million. As a result, market efficiency projects such as the IEC Project are viewed as economical by PJM because it ignores direct costs resulting from the construction of the Project.

Monitoring Analytics, LLC, or the Independent Market Monitor, notes the impropriety of PJM's exclusion of the negative effects. The Independent Market Monitor is charged with promoting a robust, competitive, and nondiscriminatory electric power market in PJM. Tr. at 2619. As part of its responsibilities, the Independent Market Monitor observes and comments "on actual and potential design flaws in market rules, standards, and procedures and identifies structural problems in PJM markets that may inhibit robust and competitive markets."[23] The Independent Market Monitor recently discussed this issue in a proceeding before FERC stating:

> The Market Monitor recommends that the rules governing benefit/cost analysis be revaluated. The current benefit/cost analysis for a regional project, for example, explicitly ignores the negative effects that an RTEP project may have on a subset of zones when calculating the Energy Market Benefits. All costs should be included in all zones and LDAs. All are relevant to an evaluation of the actual costs and benefits. There is no reason to ignore any of the costs of the projects.

OCA Cross Exh. No. 12 at 7-8. Stated simply, all costs should be included when determining the benefit of a market efficiency project, regardless of the effect.

The OCA submits that when analyzing the IEC Project under Pennsylvania law, the Commission should net the overall impact of the IEC Project. That is, the Commission should treat and consider both increases and decreases to net load payments equally and compare it to the cost to produce such an impact. As explained by OCA witness Rubin:

**Q. What is the proper way to determine the economic benefits from a project?**

[23] Monitoring Analytics, LLC, *Our Role as PJM Market Monitor*, http://www.monitoringanalytics.com/company/role.shtml (last visited Aug. 10, 2020).

A. As I explained in my direct testimony, the benefits from a project (that is, the system's "cost" of congestion) is the total of the reduction in power costs that would be experienced by customers in presently constrained zones and the increase in power costs that would be experienced by customers on the presently unconstrained side of the congestion point.

**Q. Can you provide a simple illustration of the difference?**

A. Yes. For the sake of illustration, I will assume a very simple system with two identical towns, two power plants, and one transmission line. Town A has Plant A with a capacity of 60 MW and an incremental cost of $20 per MWH. Town B has Plant B with a capacity of 20 MW and an incremental cost of $30 per MWH. Transmission line A-B can transfer the equivalent of 20 MW from Plant A to Town B.

When the demand in each town is 20 MW or less, all electricity can be provided by Plant A and the incremental cost of power is $20 per MWH in each town. But once the demand in each town reaches 20 MW, then the next increment of power in Town B must come from Plant B (at $30 per MWH). Even though capacity remains in Plant A, the transmission constraint prevents that lower-cost power from reaching Town B.

Until total demand reaches the capacity of Plant A (60 MW), the entire cost of the constraint is borne by customers in Town B with no change in cost to Town A customers. But once demand exceeds 60 MW something interesting happens -- costs are lower to Town A customers than they would be in an unconstrained system.

**Q. Can you expand your example to illustrate how Town A's costs could be lower than they would be in an optimal (unconstrained) system?**

A. Yes. Let's assume that each town's demand has reached 30 MW. Because of the transmission constraint, the demand is being met with 50 MW from Plant A (30 MW used in Town A and 20 MW exported to Town B) and 10 MW from Plant B (all used in Town B). If there were no transmission constraint, the demand would be met from the full capacity of Plant A.

So the next increment of demand (the 61st MW) in Town A in an unconstrained system would be met from Plant B at a cost of $30 per MWH. But due to the constraint, Plant A is not at full capacity, so additional demand in Town A can be met from Plant A at only $20 per MWH.

To illustrate the dollar impact, and to show the 1 difference between PJM's approach and a proper economic analysis, I'll take the scenario where each town's demand is 35 MW, or 70 MW in total. Ideally, this demand for one hour would be met with 60 MWH @ $20 ($1,200) from Plant A and 10 MWH @ $30 ($300) from Plant B, for a total cost of $1,500. But in our constrained example, Plant A can produce only 55 MW (35 MW for Town A and 20 MW for export over the

transmission line), so the actual cost is 55 MWH @ $20 ($1,100) + 15 MWH from Plant B @ $30 ($450) = $1,550. The real cost to the system of the transmission constraint during this hour is $50.

But the distribution of that cost between towns is not identical. Under unconstrained conditions, each town would pay the identical cost (1/2 of $1,500, or $750 each). But with the transmission constraint, Town A's entire 35 MW demand will be met from Plant A at a cost $20 per MWH, or $700 per hour; and Town B will pay for 20 MWH @ $20 + 15 MWH @ $30, or a total of $850 for the hour. Thus, congestion has created a benefit of $50 for Town A ($750 efficient cost - $700 constrained cost) and a cost of $100 for Town B ($750 efficient cost - $850 constrained cost).

In other words, a transmission constraint can have two effects: it can increase the price of power on the constrained side of the congestion point and it can decrease the cost of power on the other side of the constraint. It is the sum of those two effects that determines the economic cost of the constraint to the system as a whole.

In my very simple example, total system costs increased by $50 (5 additional MWH from Plant B at a higher cost of $10 per MWH). A properly performed economic analysis would recognize that the potential benefit from eliminating the constraint would be $50. That is, you would replace the production of 5 MW of Plant B @ $30 ($150) with 5 MW from Plant A @ $20 ($100), for a savings of $50. This is the maximum savings achievable during this hour.

I agree with Mr. Herling that if a project can be devised to cost-effectively eliminate the transmission constraint, the entire cost of that project should be borne by customers in Town B. As a matter of cost allocation, that is the fairest way to allocate the cost.

Where PJM and Transource are incorrect, however, is in ignoring the increase in costs in unconstrained areas when determining the benefits of a project. By using only the decrease in costs on the constrained side of the congestion point to determine the benefits of a project, PJM and Transource greatly inflate the benefits of the project, making an uneconomical project look economical. That is, in my example, the PJM approach would calculate that eliminating the constraint would save the system $100 in the sample hour. That is wholly inconsistent with the facts. It is not physically possible in my example for the shifting of 5 MWH of production from Plant B to Plant A to create a $100 benefit to the system.

OCA St. 1SR at 3-6.

If decreased wholesale power prices are netted against any increases to wholesale power prices as a result of the IEC Project, as the OCA recommends, the benefit-cost ratio of the IEC

Project is significantly below PJM's 1.25:1 benefit-cost ratio threshold. As stated by Mr. Rubin when discussing PJM's September 2018 re-evaluation of the IEC Project:

> Q. If the IEC Project provides net benefits of $17 million over 15 years, should it be constructed?
>
> A. No. As of September 2018, the estimated construction cost is $366 million, resulting in an estimated 15-year cost (PVRR) of $498 million. Thus, the IEC Project would cost significantly more than the benefits it would provide, resulting in a benefit-cost ratio of only 0.03. That is, for every dollar spent on the IEC Project, it would provide only three cents worth of benefits. Because the IEC Project is being built solely to reduce power costs, and not to provide any reliability benefits, the IEC Project is not economical and should not be built.

OCA St. 1 at 35. PJM's most recent re-evaluation in December 2019 finds that the IEC Project will provide net benefits of approximately $32.5 over 15 years when the entire PJM region is considered, with a present value revenue requirement of approximately $527 million.[24] See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-04, see also Transource St. AA-3, Exh. TJH-AA3 at 4. This would result in a benefit-cost ratio of 0.06 under a full benefit-cost analysis. Accordingly, the IEC Project provides very little benefit compared to the cost to the PJM region to construct the IEC Project.[25] Such a small overall benefit cannot justify a finding of need, nor is it sufficient to justify the infringement of property and environmental rights in Pennsylvania.

Company witness Cawley asserts, however, that the OCA witness Rubin's approach to a benefit-cost analysis is incorrect. Mr. Cawley states:

> Such an approach is not a valid cost/benefit analysis for a market efficiency project because it introduces costs that are foreign to the remedial action of eliminating congestion and have nothing to do with determining whether that action is financially feasible. The achievable savings are what they are and the construction

[24] The PVRR of $527 million is based upon an in-service cost of approximately $496 million. Transource St. AA-3, Exh. TJH-AA3 at 4.

[25] Stated another way, the annual revenue requirement for the IEC Project would be approximately $58.85 million per year. Transource St. AA-3, Exh. TJH-AA3 at 4. That is, in one year, the cost already is more than the present value of the entire net benefit from the Project over its 15-year life ($32.5 million).

> costs are what they are. Exogenous costs corrupt the feasibility calculation. Costs of other actions skew the determination of the feasibility of the action.

Transource St. 7-R at 5. Mr. Cawley also goes on to assert that the approach advocated for by OCA witness Rubin is a 'Pennsylvania-first' approach, which is anathema to regional planning because it forsakes the well-being of the grid as a whole. Transource St. 7-R at 5.

The OCA first submits that the transmission zones that experience an increase in wholesale power prices as a result of constructing the IEC Project are not exogenous or foreign to the remedial action being taken. Rather, these are impacts that PJM demonstrates will occur directly as a result of constructing the IEC Project. As further explained by OCA witness Rubin:

> As I showed in the simple example earlier in this testimony, congestion by definition results in more lower-cost power being used in the unconstrained area than is economically optimal, and less lower-cost power being used in the constrained area than is economically optimal. Eliminating (or reducing) congestion must affect both sides. A generation source only can be used at its full capacity; if a portion of that capacity is being used to serve the formerly constrained area, then it will no longer be available to the formerly unconstrained area. This effect is not a "foreign" action or "exogenous cost" -- it is an inextricable and unavoidable effect of changing the transmission system.

OCA St. 1-SR at 12. Moreover, neither the Company, nor PJM, dispute the simulated harmful impact that will occur to multiple states, including Pennsylvania, as a result of the IEC Project. OCA St. 1-SR at 1-2. Therefore, including the detrimental impact to PJM transmission zones in the calculation of the benefit-cost ratio precisely meets the benefit-cost analysis supported by Mr. Cawley. Namely, that a proper cost-benefit analysis "sums the benefits of an action and then subtracts the costs associated with taking that action." Transource St. No. 9-R at 5.

Secondly, contrary to Mr. Cawley's assertion that the OCA presents a Pennsylvania-first approach, the OCA is doing nothing of the sort. The OCA's position is that the Commission must take into account the impact to all PJM transmission zones, not just the ones that benefit from the IEC Project. The OCA's position should not be referred to as 'self-interested parochialism,' as

Mr. Cawley does, merely because the majority of the IEC Project's negative effects will occur in Pennsylvania.[26] Indeed, the OCA's position would remain the same had it been presented with similar figures showing the majority of harmful effects occurring elsewhere. As stated by Mr. Rubin in response to cross-examination from Company counsel:

> Q. And, if we were to hypothetically take this Project 9A and move it so that it was originating in Ohio and coming into Pennsylvania and it was going to produce benefits in Pennsylvania and detriments to Ohio, do you think it would be within the appropriate policy for the Ohio Public utility Commission to reject the project?
>
> A. Under your hypothetical, are the numbers the same as they are here?
>
> Q. Mm-hmm.
>
> A. Absolutely. Yes.

Tr. at 2490. Rather, it is the Company that is asking this Commission to focus exclusively on the impacts to areas in Virginia, Maryland, Washington D.C. and Western Pennsylvania, while excluding or ignoring others. This is simply inappropriate.

Lastly, while the Company asserts that the OCA's approach is antithetical to a cost-benefit analysis, this is the exact method that PJM itself previously used when determining the benefits of a Regional and Necessary Lower Voltage Project.[27] In 2014, PJM initiated a proceeding before FERC seeking to change aspects of its benefit-cost methodology as applied to Regional, Necessary

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[26] As the OCA has demonstrated, not only is it within the purview of this Commission to examine the impacts the IEC Project would have in Pennsylvania, it is incumbent upon this Commission and their obligations under the Public Utility Code, the Business Corporation Law, and, most importantly, the Environmental Rights Amendment. See Section V of the OCA's Brief, supra; see also OCA St. 1-SR at 13-14.

[27] For ease of reference a Regional Project are A.C. facilities that operate at or above 500 kV, or operate at or above 345 kV and below 500 kV, where both circuits originate from a single substations or switching station at one end and terminate at a single substation or switching station at the other end. PJM Open Access Transmission Tariff, Docket No. ER10-2710-000, Section VI, Schedule 12, Section (b)(i) https://www.pjm.com/directory/merged-tariffs/oatt.pdf. A Necessary Lower Voltage Project is new A.C. facilities, or expansions or enhancement to existing facilities that operate at voltages lower than those described by a regional project that must be constructed or strengthened to support new Regional Projects. Id. In comparison, the IEC Project is Lower Voltage Project, which is defined as any facility other than a Regional or Necessary Lower Voltage Facility, and is subject to different rules. Id., at Section (b)(ii).

Lower Voltage, and Lower Voltage market efficiency projects. See OCA Cross Exh. 4. Prior to this filing, the benefits of Regional Market Efficiency Projects was the net change in load energy payments across all PJM transmission zones, not just the zones that benefit. OCA Cross Exh. 4 at 8. This filing subsequently proposed to change the way load energy payments are calculated for Regional Projects, namely, by only calculating the sum of all benefiting PJM transmission zones. Id. The clear purpose, as stated by PJM was to ensure that more market efficiency projects are recommended for approval. Id. As stated by PJM in the 2014 transmittal letter accompanying the proposed revisions:

> Under the existing market efficiency benefit calculation for Regional and Necessary Lower Voltage Facilities, PJM factored in customers from all zones (i.e., customers with projected increases in net load payments and customers with decreases in net load payment). Net load payments are calculated by measuring the gross load payments reduced by the financial transmission credits for each zone. Net capacity payments are calculated by measuring the gross capacity payments reduced by the capacity credits for each zone. Only the customers with projected reductions in payments are deemed to benefit from the new transmission facility. *Under the current market efficiency benefit calculation, PJM has not identified one market efficiency project for Regional Facilities.*

OCA Cross Exh. 4 at 8 (emphasis added). PJM intended this change to facilitate approval of larger scale market efficiency projects. This, however, does not establish that such projects are 'needed' in the legal or regulatory sense.

By failing to consider the negative impacts that will result from construction of the IEC Project, the Company's benefit-cost analysis is incorrect and incomplete for the purpose of establishing need. Under Pennsylvania law, the Commission must consider the power needs of the public. 66 Pa. C.S. § 1501, 52 Pa. Code § 57.76(a)(4); see also Pa. Power & Light Co. v. Pa. Pub. Util. Comm'n, 696 A.2d at 250. The Company's benefit-cost analysis improperly excludes the impacts to the public in those zones that are purported to experience increased wholesale power prices, which are the majority of PJM's transmission zones and encompass several states. By

doing this, the Company is failing to capture the overall impacts to the public, which is improper under Pennsylvania law. Accordingly, when properly netting wholesale power prices across the PJM region, such a small overall benefit cannot justify a finding of need, especially in light of the Supreme Court's decision in PEDF. Approval of this Project would unreasonably degrade the Pennsylvania environment in violation of the Pennsylvania Constitution. See Robinson, 83 A.3d at 954

*c. Changes to PJM's Benefit-Cost Methodology*

In addition to the reasons identified above, PJM's analysis is unreliable because it has been through several changes which improperly inflate the benefits of the IEC Project. First, in 2014, PJM changed the formula for calculating the benefits of a market efficiency project by eliminating consideration of the change in system production costs, a metric calculated to determine the efficient use of generation on PJM system-wide basis. The second change, made in February 2019, eliminated potential future generation with a facilities services agreement from the model used to simulate the benefits of the IEC Project ignoring likely increases in solar and other low-cost generation in Virginia and Maryland in future years, thereby inflating future congestion in the simulated model. The OCA will deal with each in turn.

i. 2014 Benefit Metric Change

Prior to 2014, the benefit portion of the IEC Project would have been calculated as follows:

> Energy Market Benefit = [.70] * [Change in Total Energy Production Cost] + [.30] * [Change in Load Energy Payment]

Transource St. 7-R at 13. That is, rather than consider only the change in net load payments, as is currently done, PJM would have also considered the total change in energy production costs resulting from the IEC project. The total change in energy production costs is calculated at the PJM system-wide level and refers to the change in system generation variable costs (i.e. fuel costs,

variable operating and maintenance costs, and emissions costs) associated with total PJM energy production.[28] Transource St. 7-R, Exh. SRH-3R at 12. In discussing the IEC Project, Mr. Rubin explains how it fails to demonstrate sufficient production cost savings:

> The $260 million savings in system production costs is…the amount by which the Project would lead to the more efficient use of generation resources throughout all of PJM. In other words, it represents the reduced power production costs (discounted over 15 years) that would result if the Project were constructed and the system operated as PJM modeled it to operate.
>
> Importantly, that level of savings would occur from a project with a 15-year cost (present value of revenue requirements) of $498 million, as I discussed on page 35 (and elsewhere) in my direct testimony. In other words, a project with a 15-year cost of almost $500 million would produce just $260 million of system-wide production cost savings over that same time period. This is a further indication that the Project is not economical and should not be constructed

OCA St. 1SR at 9-10.[29]

As explained by Mr. Herling, however, PJM initiated a proceeding before FERC in 2014 to remove consideration of the change in total energy production costs when calculating the benefits of a lower voltage market efficiency project, such as the IEC Project. Transource St. 7-R at 13. Rather than utilize a weighted equation of 70 percent of production cost savings and 30 percent of net load payment benefits, PJM modified it to 100 percent of the change in net load payments. Id. As a result, the benefits of the IEC Project are now solely based upon the change in net load payments over the first fifteen years of the IEC Project's service life for only those zones that benefit.

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[28] Compare this to PJM's calculation of the change in net load payments, which calculates the change in wholesale power prices for each transmission zone, only includes those zones that experience decreases in wholesale power prices, and does not include system generation variable costs. Transource St. 7-R, Exh. SRH-3R at 12.

[29] Please note that the amounts utilized for the change in load energy payments in the quoted text is from the September 2018 re-evaluation. Those numbers constituted the most recent information at the time testimony was submitted. Most recently, PJM's analysis of the IEC Project, inclusive of the alternative configuration of the East Portion of the IEC Project, now being sought for approval indicates that if the Project were built, PJM would experience system-wide savings of approximately $150 million. See Transource St. AA-3, Exh. TJH-AA3 at 4.

Comparatively, PJM did not propose to eliminate consideration of PJM region-wide energy production costs when calculating the benefit-cost ratio for a Regional or Necessary Lower Voltage market efficiency project. OCA Cross Exh. 4 at 7. Rather, for Regional market efficiency projects, the Company changed the weighted 70/30 split to the now current 50/50 split with equal consideration of production cost savings and net load payments. Id.

Had PJM calculated the benefits of the IEC Project as it calculates the benefits of Regional market efficiency projects, the IEC Project would have failed to pass PJM's benefit-cost ratio threshold. As explained by OCA witness Rubin, giving equal consideration to both the change in net load payments and the change in total production costs, would have the following effect:

> Under PJM's methodology for higher-voltage market-efficiency projects, system level production cost savings would receive a 50% weighting in determining the project's benefits. The other 50% would be made up of savings in the benefiting zones. If that methodology were used for this project, it would result in the Project's 15-year discounted "benefits" being calculated to be: (50% x $260.13 million) + (50% x $707.29 million) = $483.71 million. This is less than the Project's 15-year discounted cost of $498 million, meaning that the Project would fail to provide a benefit-cost ratio of 1.0, let alone PJM's required ratio of 1.25 or higher. Thus, if system-level production cost savings were considered, as Mr. Horger posits, PJM's own methodology would result in the project failing the benefit-cost test.

OCA St. 1SR at 10. Accordingly, had the IEC Project's benefit-cost ratio included consideration of the production cost savings, as PJM considers appropriate for higher voltage market efficiency projects, the IEC Project would never have been considered by PJM as economical.

ii. FSA Generation

In February 2019, a FERC Order was entered approving changes proposed by PJM to the way it models the economic impacts of a proposed transmission project. Specifically, the new change removes all potential future generation with an executed Facilities Studies Agreement (FSA) from the model used to simulate the economic benefits of a potential transmission project. In other words, the Company is modeling future benefits of a proposed transmission project

without the inclusion of a significant amount of potential generation that will likely exist on the grid in the future, including in the constrained region. This effectively inflates the problem of congestion on the AP South Reactive Interface thereby inflating the benefits of the IEC Project.

At the beginning of this proceeding, PJM's ProMod software included generating facilities that executed a Facilities Studies Agreement, or an FSA.[30] As part of siting and installing new generation, a Facilities Study must be conducted to determine the design, cost, and schedule of construction. An FSA is a signed agreement between the customer, or the developer of the proposed generation, and PJM to identify the scope of facility additions and upgrades to be included in the Facilities Study. Had the FSA been signed, the proposed generation would have been modeled as part of the bulk electric grid in the ProMod analysis. That is, the simulation would have acted as if that FSA generation was operational and in use when simulating the benefits.

PJM sought approval from FERC in 2014 to model FSA generation in the ProMod analysis. In the transmittal letter to FERC, PJM had the following to say as support for including FSA generation in the modeling:

> In this filing, PJM proposes to include generation with an executed FSA (along with any identified network upgrades that were identified to reliably interconnection the unit with the system) in its assumptions. Including generation with an FSA, as well as any identified network upgrade, will reduce the likelihood of creating congestion due to generation scaling. In addition, this method will allow PJM to consider significantly more generation active in the PJM interconnection

[30] To perform its market efficiency evaluations, PJM utilizes a third-party software owned and licensed to PJM by ABB, a company that specializes in electrification products, robotics and motion, industrial automation, and power grids. ABB, *About ABB*, https://new.abb.com/about (last visited Aug. 10, 2020). The ABB software suite that PJM utilizes is referred to as 'ProMod,' which is an electric network simulation tool that "incorporates extensive details in generating unit operating characteristics, transmission grid topology and constraints, and market system operations to support economic transmission planning." ABB, *ProMod: Fundamental electric market simulation tool*, https://new.abb.com/enterprise-software/energy-portfolio-management/market-analysis/promod (last visited Aug. 10, 2020). Using this information, the model provides PJM "nodal locational marginal pricing (LMP) forecasting and transmission analysis *by producing algorithms that align with the decision focus of management*." Id.

> queue and should result in minimal or no additional scaling to meet the reserve requirement.

OCA Cross Exh. 4 at 10 (footnotes omitted).

On December 14, 2018, PJM initiated another proceeding before FERC now seeking to exclude generation with an executed FSA from the ProMod analysis in direct contravention of its previous efforts. Transource Hearing Exh. No. 19 at 1.[31] This revision to the parameters of the ProMod model had a significant impact upon the modeled benefits of the IEC Project. Prior to the implementation of this change, PJM's September 2018 ProMod analysis showed that the benefit-cost ratio of the IEC Project was 1.40. More specifically, the model showed that there would be a decrease of $707.29 million in net load payments over a period of 15 years, excluding those zones that experience an increase. OCA St. 1 at 33. After excluding FSA generation from the model, PJM determined that the benefit-cost ratio of the IEC Project at the time increased to 2.17. Transource Hearing Exh. No. 6. Moreover, the model now showed that there would be a decrease of $982.07 million in net load payments over a period of 14 years, excluding those zones that experience an increase. OCA Hearing Exh. No. 2 at 2. That is a difference of approximately $275 million between the two simulations.

In PJM's most recent re-evaluation of the benefits of the IEC Project, inclusive of the alternative configuration of the East Portion of the IEC Project, PJM's simulation continues to exclude FSA generation in the model used to simulate future congestion. OCA Hearing Exhibit No. 3, Transource Response to OCAXLVII-3. Specifically, PJM's modeling software removed a lot of potential low-cost generation that may be constructed in Maryland and Virginia, which could have a measurable impact on congestion in future years. See OCA Hearing Ex. No. 3, Transource

[31] Transmission developers took issue with this change, stating that removing all FSA generation from the model will artificially inflate the problem of congestion. Transource Hearing Exh. No. 19 at 5-6.

Response to OCA-XLVII-Question 4. The chart below indicates just some of the FSA generation resources removed from the model used to simulate future congestion:

**MD and VA FSA Generation Above 50 MW Excluded from the ProMod Simulation**

| Name | Category | Area | Maximum Capacity (MW) | State |
|---|---|---|---|---|
| Q_FSA_AB2-036 | Solar PV (Planned) | Delmarva Power & Light Company | 92 | MD |
| Q_FSA_AB2-037 | Solar PV (Planned) | Delmarva Power & Light Company | 202 | MD |
| Q_FSA_AB2-120 | Solar PV (Planned) | Delmarva Power & Light Company | 100 | MD |
| Q_FSA_AB2-133 | Solar PV (Planned) | Delmarva Power & Light Company | 55.8 | MD |
| Q_FSA_AB2-135 | Solar PV (Planned) | Delmarva Power & Light Company | 64 | MD |
| Q_FSA_AB2-136 | Solar PV (Planned) | Delmarva Power & Light Company | 51.1 | MD |
| ZZQ_AC1-190 | Solar PV (Planned) | Delmarva Power & Light Company | 50 | MD |
| Q_FSA_AB2-160 | Solar PV (Planned) | Virginia Power Company | 80 | VA |
| Q_FSA_AB2-161 | Solar PV (Planned) | Virginia Power Company | 50 | VA |
| Q_FSA_AB2-190 | Solar PV (Planned) | Virginia Power Company | 160 | VA |
| ZZQ_AC1-043 | Solar PV (Planned) | Virginia Power Company | 100 | VA |
| ZZQ_AC1-065 | Solar PV (Planned) | Virginia Power Company | 50 | VA |
| ZZQ_AC1-083 | Solar PV (Planned) | American Electric Power | 100 | VA |
| ZZQ_AC1-105 | Solar PV (Planned) | Virginia Power Company | 51 | VA |
| ZZQ_AC1-107 | Combined Cycle | Virginia Power Company | 1600 | VA |
| ZZQ_AC1-120 | Solar PV (Planned) | Virginia Power Company | 60 | VA |
| ZZQ_AC1-122 | Solar PV (Planned) | American Electric Power | 60 | VA |
| ZZQ_AC1-143 | Solar PV (Planned) | Virginia Power Company | 60 | VA |
| ZZQ_AC1-145 | Solar PV (Planned) | Virginia Power Company | 50 | VA |
| ZZQ_AC1-161 | Solar PV (Planned) | Virginia Power Company | 240 | VA |
| ZZQ_AC1-164 | Solar PV (Planned) | Virginia Power Company | 320 | VA |
| ZZQ_AC1-191 | Solar PV (Planned) | Virginia Power Company | 80 | VA |
| ZZQ_AC2-012 | Solar PV (Planned) | Virginia Power Company | 150 | VA |
| ZZQ_AC2-078 | Solar PV (Planned) | Virginia Power Company | 60 | VA |
| ZZQ_AC2-079 | Solar PV (Planned) | Virginia Power Company | 85 | VA |
| ZZQ_AC2-100 | Solar PV (Planned) | Virginia Power Company | 50 | VA |
| ZZQ_AC2-102 | Solar PV (Planned) | Virginia Power Company | 80 | VA |
| ZZQ_AC2-112 | Solar PV (Planned) | Virginia Power Company | 150 | VA |
| ZZQ_AC2-123 | Solar PV (Planned) | American Electric Power | 75 | VA |
| ZZQ_AC2-141 | Solar PV (Planned) | Virginia Power Company | 240 | VA |

See OCA Hearing Exh. 3, Transource Response to OCA-XLVII-4, Attachment (excerpt). The above list is merely an excerpt of the FSA Generation excluded from the ProMod model. By failing to model this capacity, the congestion constraint increases because it now shows that there is even less lower-cost generation in the constrained area. Removing the entirety of executed FSA generation in the entire PJM region multiplies this effect. Accordingly, the benefit-cost ratio increased by a substantial margin in February 2019 and is inflated in the most recent re-evaluation.

The OCA submits that removal of all generation with an executed FSA from the ProMod model is an unrealistic portrayal of the future bulk electric grid. As stated by PJM, 36 percent of all generation with an executed FSA reaches commercial operation. Transource Hearing Exh. 19 at 3 (emphasis added). It is unreasonable, therefore, to assume that no new generation at the FSA level will be installed in the future. In effect, PJM is ignoring large amounts of generation that will represent the future electric grid, much in the same way that PJM is ignoring zones that see price increases. This type of modeling and forecasting that appears aimed at reaching pre-determined conclusions is unreasonable.

Moreover, some of this generation should be modeled to present an accurate picture of future generation on the bulk electric grid, especially in light of the push towards renewable generation. For example, the Virginia General Assembly recently passed the Grid Transformation and Security Act of 2018, encouraging the construction of renewable energy sources and the implementation of demand-side management programs. OCA St. 3 at 19-20. OCA witness Crandall further explains:

> The new law finds that up to an additional 5,000 MW of utility-scale electric generating facilities powered by solar and wind energy is in the public interest, and in addition finds that an additional 500 MW of non-utility scale solar or wind generating facilities, including rooftop solar installations are in the public interest.
>
> The GTSA also encourages increased demand-side management programs to help customers conserve energy and reduce system peak loads. This law will cause the implementation of energy efficiency and demand response programs capable of reducing customers' overall annual energy usage by 805 gigawatt-hours (GWh) and system peak demand by 304 MW by 2033.
>
> The GTSA requires Virginia Power Company (Dominion) to commit at least $870 million to implement energy efficiency programs for the period beginning July 1, 2018, and ending July 1, 2028, which includes Virginia Power's existing energy efficiency programs.

OCA St. 3 at 19-20. Similarly, the District of Columbia City Council recently determined that by 2032, 100 percent of electric energy used in the District of Columbia should by supplied by solar

energy.[32] In fact, the District of Columbia recently conducted an analysis finding that there is a technical potential of 2,498,000 MWh/year for rooftop solar and urban utility scale solar potential. OCA St. 3 at 22. Accordingly, these developments indicate significant investment in renewables in the constrained area. It is improper, therefore, for PJM to assume that there will be no FSA generation that is ultimately used and useful throughout the entire PJM region in future years. This error is similar to that of Re West Penn Power Company, where the Commission rejected the proposed transmission project, in part, because the Company failed to model future generation in its load flow studies, having the project appear more necessary than future circumstances might suggest. 1980 Pa. PUC LEXIS 49 at *5-10.

As shown above, PJM has made several changes to its benefit-cost methodology altering how benefits are calculated by removing consideration of the production cost savings and altering the parameters used to simulate future congestion on the PJM system by removing future sources of low-cost generation in the constrained areas of the system, thereby inflating future congestion in the simulation. PJM's modeling has appeared to create a solution in search of a problem.

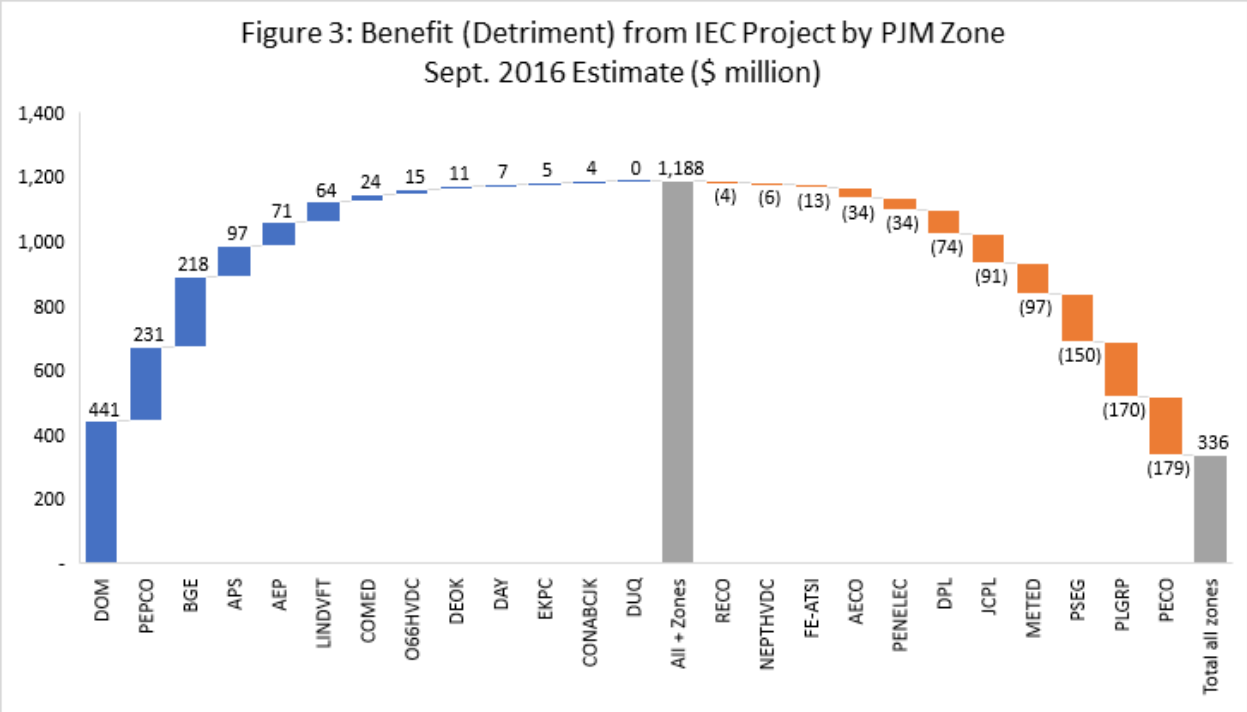
*d. The Company's Evidence of the IEC Project's Benefits and Costs are Uncertain.*

The OCA submits that the Company's forecasts have frequently changed throughout this proceeding demonstrating that the forecasted impacts of the IEC Project are highly uncertain. Accordingly, these varying forecasts, taken together with the other deficiencies in PJM's analysis, cannot meet the burden of proof in this proceeding.

In August 2016, when the IEC Project was recommended for initial approval by PJM, the results of PJM's simulation claimed that the Project would lower the cost of wholesale power prices in the PJM region by approximately $1.188 billion. OCA St. 1 at 20. According to PJM's

[32] CLEANENERGY DC OMNIBUS AMENDMENT ACT OF 2018, D.C. Act 22-583 (D.C. 2018).

benefit-cost methodology, the purported benefit-cost ratio of the project at that time was approximately 2.5.[33] Id. Moreover, not included in this calculation, but also demonstrated by PJM's analysis, was that the IEC Project would increase wholesale power prices in the PJM region by approximately $851 million. OCA St. 1 at 26. In total, the September 2016 PJM analysis indicated that there would be a net benefit to PJM of $336 million. The impact on each PJM transmission zone was as follows:

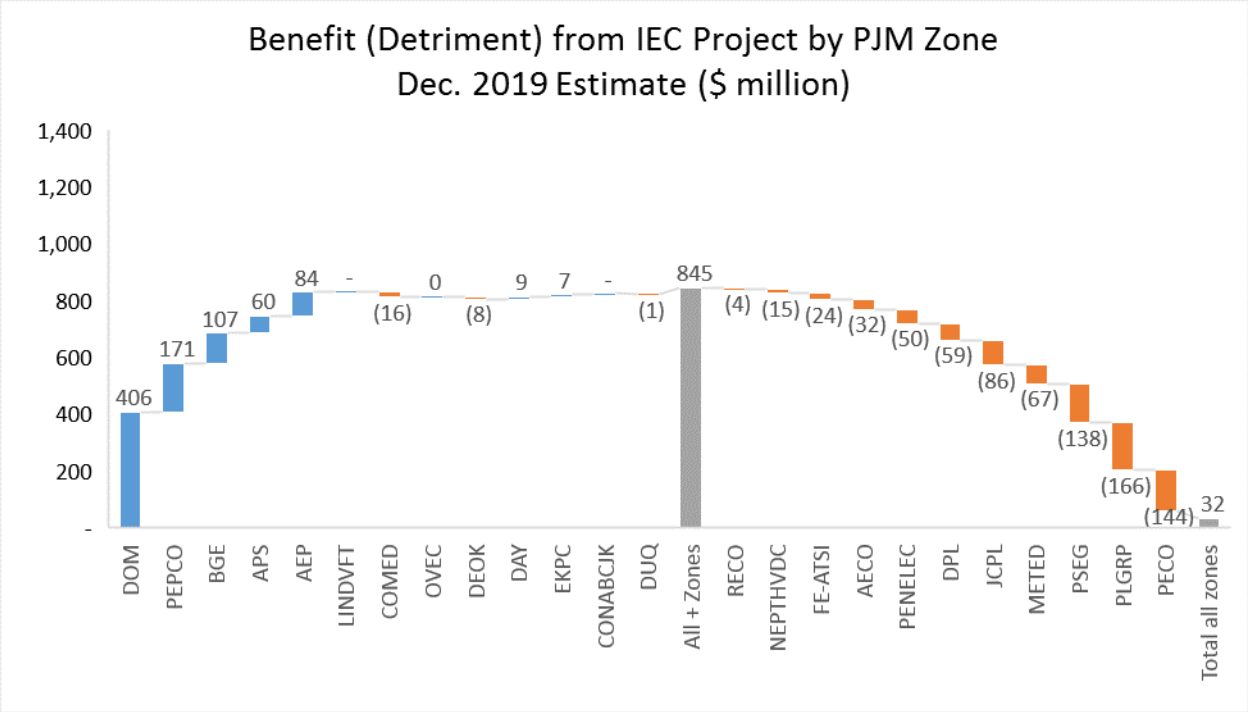



OCA St. 1 at 27.

In PJM's most recent analysis performed in December 2019, the impact of the IEC Project, inclusive of the alternative configuration of the East Portion of the IEC Project, has significantly changed. The results of PJM's simulation claimed that the IEC Project would lower the cost of wholesale power prices in the constrained region by approximately $845 million. OCA Hearing

[33] The OCA's discussion of the benefits of the IEC Project, and the benefit-cost ratio, is not an acceptance that these figures are accurate or reliable. Rather, as the OCA has indicated throughout this Brief, the benefits of the IEC Project are overstated for the reasons it has already identified. The OCA only refers to this data to demonstrate its point that the evidence has changed throughout this proceeding.

Exh. 3, Transource Response to OCA-XLIII-4. According to PJM's benefit-cost methodology, the benefit-cost ratio of the project is now approximately 1.60.[34] Moreover, the IEC Project is now forecasted to increase wholesale power prices in the rest of the PJM region by approximately $812 million. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4. In total, the December 2019 re-evaluation indicates that there will only be a net benefit to the entire PJM-region of approximately $32.5 million. Moreover, several transmission zones that were once expected to benefit now realize no benefit, or in some instances experience increased wholesale power prices. This includes the LINDVFT, COMED, OVEC, and DEOK Transmission Zones. The impact on each PJM transmission zone was as follows:




Derived from OCA Hearing Ex. No. 3, Transource Response to OCA-XLIII-4.

[34] The OCA notes that the 1.60 benefit-cost ratio includes a construction cost of $496 million, or a present value revenue requirement of $527 million. See Transource St. AA-3, Exh. TJH-AA3 at 4. $845 million in benefits divided by a present value revenue requirement of $527 million amounts to a benefit-cost ratio of approximately 1.60.

Under PJM's most recent analysis, the impacts of the IEC Project have significantly changed. Furthermore, this is just one of the several re-evaluations that have occurred throughout this proceeding. See OCA St. 1 at 22; see also Transource Hearing Exh. 6, Transource St. AA-3 at 2-3. Each time, PJM's analysis has produced widely varying results with PJM's calculated benefit-cost ratio falling anywhere between 2.5 to as low as 1.30 as calculated by PJM. See Transource St. 8-R, Exh. TH-5R at 3. The significant differences produced by PJM's simulations are concerning, particularly in light of the rest of the evidence in this proceeding. Accordingly, the Company's evidence should be given little weight by this Commission.

*e. Conclusion*

Setting aside the fact that actual historical congestion on the AP South Reactive Interface has decreased dramatically since the selection of this Project by PJM, the evidence demonstrates that PJM's benefit-cost analysis is fundamentally flawed in several respects. For one, PJM's analysis does not take into consideration the transmission zones that will experience increased wholesale power prices as a result of construction of the IEC Project. That is, the Company's most recent re-evaluation in December 2019 calculating the IEC Project's benefit-cost ratio excludes from this calculation the $812.5 million increase in wholesale power prices that load-serving entities in Pennsylvania, New Jersey, Delaware, Maryland, Ohio and Illinois will experience as a result of the IEC Project. Moreover, the evidence demonstrates that PJM has changed its benefit-cost methodology in multiple instances improperly inflating the benefits of this market efficiency project. The changing impacts of the IEC Project in subsequent PJM re-evaluations further highlights the problematic nature of the market efficiency process. As stated by the Independent Market Monitor in its most recent PJM State of the Market Report:

> …there are significant issues with PJM's current benefit/cost analysis which cause it to consistently overstate the potential benefits of market efficiency projects. The MMU recommends that the market efficiency process be eliminated.

OCA Hearing Exh. 6 at 72-73. For these reasons, the Company's reliance on PJM's analysis is flawed and should not be accepted by this Commission as meeting the Company's burden of proof in this matter.

5. Under a Proper Benefit-Cost Analysis, the PJM Region as a Whole will be Negatively Impacted by the IEC Project.

As discussed above, wholesale power prices for load-serving entities in multiple states, including Pennsylvania, New Jersey, Delaware, Maryland, Ohio, and Illinois will increase as a result of this Project. Furthermore, when properly taking into account both the positive and negative impacts of the IEC Project, the net benefit of the IEC Project across the entire PJM region is approximately $32.5 million over a period of 15 years resulting in a benefit-cost ratio of approximately 0.06. Accordingly, the economic benefits are minimal and any market efficiency gains are imperceptible.

In December 2019, Transource submitted PJM's latest re-evaluation of the economic benefits of the IEC Project, inclusive of the alternative IEC East Portion of the Project. Transource St. No. AA-3, Transource Ex. TJH-AA3. Specifically, the Company's most recent forecasts allege that the IEC Project will have a benefit-cost ratio anywhere from 1.46 to 1.66, depending upon the cost of the project and load simulated in future years, excluding the impacts on zones that are negatively impacted. Transource St. No. AA-3 at 4. The Company provides a more detailed breakdown claiming that for the zones that benefit, *i.e.* the zones that will experience a decrease in wholesale power prices, will realize approximately $845 million in decreased power prices over a period of fifteen years between 2023 and 2037, discounted to present value. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4.

This data, while seemingly beneficial on its face, is an unrealistic, inflated assessment of the IEC Project's actual effects. As stated above, the Company's figures completely ignore the

PJM transmission zones that will be harmed as a result of the IEC Project. In the most recent simulation of the effects of the IEC Project, it is clear that load-serving entities in portions of Pennsylvania, New Jersey, Delaware, Maryland, Ohio, and Illinois will experience approximately $812.5 million in increased wholesale power prices over that same period of time. OCA Hearing Ex. No. 3, Transource Response to OCA-XLIII-4. That is, the IEC Project provides net benefits of approximately $32.5 million over a fifteen years.

The Company is seeking approval of a Project that will cost approximately $527 million over a period of fifteen years to construct that will only lead to a net decrease in wholesale power prices of approximately $32.5 million over that same period of time.[35] This simply makes no sense from an economic perspective or legal perspective. As OCA witness Rubin stated in response to cross-examination from Company counsel:

> …I reached the same conclusions whether we look only at Pennsylvania or whether we look at PJM as a whole. Either way this project makes no sense. You don't spend 350 or $400 million so you can save $12 million over a 15-year period. It makes no sense.
>
> Q. Only under your cost-benefit analysis; is that right?
>
> A. Under any logical view of what's happening. If you build this project, you can save utilities in Maryland, Virginia, and the District of Columbia almost a billion dollars over 15 years; and, if you don't build that project, that same power is going to be used in Pennsylvania, Ohio, Illinois, and New Jersey at a cost of about $970 million.
>
> So, yes, there is some congestion. There is a technical problem to be solved, and the value of that congestion as laid out in the most recent estimate we have is

[35] The OCA also notes that the cost to construct the IEC Project has increased over time. At the time the Company filed the Company's Applications in December 2017, total cost to construct the IEC Project was approximately $340.6 million. OCA Hearing Exh. 1, Transource Response to OCA-XXII-16. As of December 2019, the total project cost is approximately $496 million. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-3. The latter amount includes a 25 percent contingency for cost overruns. Id. Additionally, any costs above this amount are subject to recovery by the Company as there is no cost cap for the IEC Project. See Applications, Att. 2, App. 2.3.

Separately, the $527.60 million refers to the present value revenue requirement, which is the annual amount the transmission zones would pay for the first fifteen years of the IEC Project's service life. See OCA St. 1 at 11. This is the cost figure used to determine the cost-benefit ratio for the IEC Project.

> less than a million dollars a year over the next 15 years. So this project makes no sense. I don't care how you run the numbers or how you talk about it. Those are the latest numbers we have, and you can exclude them if you want to but that's reality.

Tr. at 2504.[36]

This outcome, however, is further weakened considering that the costs to construct the IEC Project must be collected from customers in the zones that allegedly benefit from this project, *i.e.* load-serving entities in Virginia, Maryland, Washington D.C., and Western Pennsylvania. Transource St. 8-R, Exh. TH-3R at 28, 31. Specifically, the greater a transmission zone benefits from the IEC Project, the more costs that transmission zone is expected to pay. OCA St. 1 at 36-37. For example, load-serving entities in the Dominion Transmission Zone, which is located primarily in Virginia, will recognize approximately $400 million in benefits over a period of 15 years, but will be required to pay approximately 39.92 percent of the Project's cost. See OCA Sch. SJR-5. Similarly, the APS Transmission zone, which includes a portion of Western Pennsylvania, is required to pay for approximately 8.73 percent of the cost of the IEC Project. Id. As of September 2018, load-serving entities in Western Pennsylvania would have to pay $31.97 million to construct the IEC Project.[37] Id. In addition, some load-serving entities in transmission zones that were once expected to benefit, such as the COMED Transmission zone, are still required to pay for a portion of the Project's cost, even though that transmission zone will no longer benefit

[36] Please note that at the time of Mr. Rubin's testimony he was relying upon data from the IEC Project's re-evaluation in February 2019. The impacts of the IEC Project, inclusive of the alternative configuration of the East Portion of the IEC Project, remain largely the same.

[37] The OCA notes that this figure was determined based upon the cost of the IEC Project in September 2018. As the IEC Project's cost has grown over time, the amount load-serving entities in Pennsylvania must pay are likely higher. See fn. 38, infra. Compare this to the expected 15-year benefit of $27 million in wholesale power price reductions to Western Pennsylvania. See fn. 41, infra. As such, load-serving entities in western Pennsylvania would pay more to construct the IEC Project than would benefit over a period of 15 years.

from the Project. See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4; see also OCA St. 1, Sch. SJR-5.[38]

Additionally, the Company is entitled to recover any expenditures that exceed the Project's estimated cost. See Applications, Att. 2, App. 2.3. Accordingly, there is no cost cap or limiter on the cost to construct the Project. Therefore, if the actual cost to build Transource's portion of the IEC Project exceeds the current estimate, the company is entitled to seek recovery of those costs. Tr. at 2111-12.[39] Based on this information, the actual cost to build the IEC Project could be more than estimated and the benefitting transmission zones would be required to pay for any additional costs that the Company could show as being prudent and reasonable expenditures.[40]

On this basis alone, the Company has not demonstrated need for the IEC Project. When examining the future necessity of economic congestion in the AP South Reactive Interface under PJM's forward-looking models, which are at odds with present congestion on the AP South Reactive Interface, there is simply no reason to construct the IEC Project. Requiring load-serving entities to pay an estimated $527 million to achieve net savings of $32.5 million in reduced

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[38] As a more general matter, the allocation of project costs is made in a FERC filing at the time the market efficiency project is recommended by PJM for approval. The cost allocation is attributed to the benefiting transmission zones proportional to its benefits. As the OCA has shown above, see Section VI.B.4.d, the simulation is highly dynamic, changing often. Accordingly, the zones that are allocated the costs could likely see little to no benefit from this project if the actual outcome greatly varies from the simulated benefits. Yet, those transmission zones would still be required to pay for the project as PJM will not seek to change the allocation factors. See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-19. The COMED Transmission zone serves as an example of this. PJM's December 2019 re-evaluation indicates that COMED will experience approximately $16 million in increased wholesale power prices over a period of 15 years. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4. Yet, COMED is still expected to pay for approximately 2.16 percent of the Project cost. OCA Sch. SJR-5.

[39] It should also be noted that other projects, which submitted proposals to address the AP South Reactive Interface congestion, did have cost containment provisions preventing recovery of dollars over a specified amount. Tr. at 2113-14.

[40] PJM later amended its Operating Agreement in 2020 to require future transmission projects to include a cost cap to prevent captive benefiting load-serving entities from being subject to huge cost overruns. PJM Interconnection, LLC, Docket Nos. ER19-2915-000, et al., 170 FERC ¶ 61,243, at *62,832-33 (Mar. 20, 2020). This was approved by FERC on March 20, 2020. Id., at 62,837. This does not retroactively apply to the IEC Project.

wholesale power prices over the first fifteen years of the Project is fiscally inappropriate and legally insufficient under the Commission's regulations.

6. The Impact to Pennsylvania also Demonstrates that the IEC Project Cannot Meet the Regulatory and Constitutional Standards.

When examining the impacts the IEC Project will have on Pennsylvania, there is simply no benefit for Pennsylvania and certainly no legitimate reason to infringe upon the environmental rights of Pennsylvanians. The latest re-evaluation of the 'benefits' of the IEC Project demonstrates that approximately $27 million in lower wholesale power prices will accrue to load-serving entities in Western Pennsylvania in the first fifteen years of the IEC Project's useful life, or approximately 3.2 percent of the total purported 'benefits.'[41] Comparatively, the rest of Pennsylvania will experience a combined increase in wholesale power prices of approximately $429 million. See OCA Hearing Exh. 3, Transource Response to OCA-XLII-15.[42] That amounts to a net increase in wholesale power prices of approximately $402 million in Pennsylvania. Id.

[41] The APS zone is composed of a portion of Western Pennsylvania, West Virginia, Maryland, and Virginia. See OCA Cross Exh. 10. PJM's latest re-evaluation indicates that APS will see reduced wholesale power prices of approximately $60 million over the first 15 years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLII-15. To calculate Pennsylvania's share of the benefits, the OCA's witness measured Pennsylvania's percentage of peak demand contributed to the APS system in the summer of 2018, which was approximately 44.75 percent. OCA St. 1, Sch. SJR-6. Accordingly, Pennsylvania would likely experience approximately $27 million in reduced wholesale power prices for the first fifteen years of the IEC Project's service life, or 44.75 percent of the APS zone's benefit.

[42] This number includes increases of approximately $166.1 million in the PLGRP Transmission zone, $143.6 million in the PECO Transmission Zone, $66.7 million in the METED Transmission Zone, $50.3 million in the PENELEC Transmission Zone, $1.8 million in the FE-ATSI Transmission Zone, and $0.9 million in the DUQ Transmission Zone. OCA Hearing Exh. 3, Transource Response to OCA-XLII-15.

With respect to FE-ATSI, PJM's latest re-evaluation indicates that the FE-ATSI Transmission Zone will see increased wholesale power prices of approximately $24.5 million over the first 15 years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-15. Pennsylvania only comprises a portion of the FE-ATSI Transmission Zone. See OCA St. 1, Sch. SJR-6 at 2. To calculate Pennsylvania's share of the detriment, the OCA's witness measured Pennsylvania's percentage of peak demand contributed to the FE-ATSI system in the summer of 2018, which was approximately 7.20 percent. OCA St. 1, Sch. SJR-6. Accordingly, Pennsylvania would likely experience approximately $1.8 million in increased wholesale power prices from the FE-ATSI Transmission Zone for the first fifteen years of the IEC Project's service life, or 7.20 percent of the FE-ATSI zone's detriment.

In addition, approval of the IEC Project would result in numerous environmental impacts to the land of Pennsylvania and certain landowners. In particular, the Company will construct 24.4 miles of new transmission line in Franklin County, 13.7 miles of which will be constructed over presently unencumbered land. IEC-West Application at 4; see also IEC-West Application, Att. 3 at 93-95. That is in addition to construction of the Rice substation in Franklin County proposed to serve the new transmission line. In York County, the Company would re-conductor, in co-operation with PPL, approximately 29 miles of transmission line, expand 4 miles of currently-owned ROW to construct two new 2-mile segments of 230 kV Transmission Line, and the construction of a brand new Furnace Run Substation. As stated previously in the Brief, this creates significant environmental impacts to the affected communities.

Contrary to the Company's claims that the OCA's position is 'self-interested parochialism,' this Commission has an obligation to consider the impacts a proposed transmission line will have on Pennsylvania landowners and Pennsylvania ratepayers. As stated by the Commission in its recent Order describing its obligations under the Environmental Rights Amendment:

> The Commission, consistent with our role as a fiduciary responsible for the preservation of the Commonwealth's natural resources, and consistent with *PEDF*, acts with prudence, loyalty and impartiality when adhering to these regulations. In this manner, we fulfill our responsibility to protect the public's natural resources from depletion or degradation, while also allowing legitimate development that improves the lot of Pennsylvania's citizenry...

Bedford North-Central City West 115 kV, Opinion and Order at 14 (emphasis added). To meet that obligation, the Commission's Regulations require it to consider a broad range of evidence. 52 Pa. Code § 57.75(e). As further summarized by OCA Witness Rubin in response to cross-examination from Company counsel:

Q. Well, it's a pretty simple question. Should state lines be considered or not?

> A. Well, this Commission as I understand it is charged with protecting the citizens of Pennsylvania, ensuring that their rates are just and reasonable and nondiscriminatory, ensuring that their service is safe, adequate, and reliable, and so on. In my understanding that's the extent of this Commission's role is to safeguard the citizens within the Commonwealth.
>
> Out of the 40-some pages of testimony, there's three or four pages that deal specifically with the impacts within Pennsylvania. The rest of it is looking throughout this part of the PJM footprint. As I understand it as it was explained to me by counsel, the Administrative Law Judges asked for some Pennsylvania specific information, so we provided that.
>
> You know, I believe this Commission has to do its job as it's laid out in the statute, and that includes protecting the citizens and businesses of this Commonwealth. As Mr. Cawley explained, the Commission also has some other responsibilities that allow it to consider information occurring outside of this Commonwealth.
>
> I reached the same conclusions whether we look only at Pennsylvania or whether we look at PJM as a whole. Either way this project makes no sense. You don't spend 350 or $400 million so you can save $12 million over a 15-year period. It makes no sense.

Tr. at 2503-04.

Furthermore, while the Company asserts that failure to construct the IEC Project may result in potential future reliability violations, there are no associated reliability violations that this Project was designed to resolve. See e.g. Transource St. 3 at 24, Transource St. 8-R, Exh. TH-5R at 2. To be clear, there are no current reliability violations associated with the congestion on the AP South Interface. None of our neighbors to the south in Maryland, the District of Columbia or Virginia will see any interruption in their electric service due to this congestion, and certainly no Pennsylvania customers will experience any degradation of the electric service they currently receive as a result of this congestion. The OCA will deal more fully with the Company's reliability claims further below in Section VII.

In conclusion, the Company is asking this Commission to infringe upon the inviolate rights of Pennsylvanians, specifically the rights protected by the Environmental Rights Amendment, to

construct a Project which provides no net benefits to Pennsylvania and would result in the degradation of the Pennsylvania environment in direct violation of the Pennsylvania Supreme Court's decision in PEDF. There is simply no basis for the Company's proposal under either the Commission's regulations or under the Constitution of Pennsylvania. Accordingly, this Project should be rejected.

7. Conclusion

The OCA submits that the Company has failed to meet its burden of proof in this proceeding. That is, the Company has not demonstrated that this Project meets the requirements established under the Environmental Rights Amendment, nor does it meet the Commission's Orders and regulations as to establishing need. The IEC Project is a market efficiency project developed and designed to address congestion on the AP South Reactive Interface which has eroded since this proceeding has begun. In 2014, congestion on the AP South Reactive Interface cost approximately $487 million. In 2019, congestion on the AP South Reactive Interface cost approximately $14.5 million in 2019.

Moreover, even setting this aside, the Company's reliance on PJM's benefit-cost analysis is misplaced. PJM's analysis ignored any harmful economic effect caused by the IEC Project because it does not consider transmission zones that experience increases in wholesale power prices over the simulated period. Thus, presenting an inflated benefit-cost ratio. Indeed, these issues are further amplified by PJM's changes to the methodology used to calculate the benefits of the project and the parameters used to simulate future congestion. Altogether, if the IEC Project were approved, it would result in net benefits to the PJM region of approximately $32.5 million over a period of 15 years and those that benefit would have to pay approximately $527 million over that same period of time. This is not an economical transmission project.

Ultimately, if approved, the effect of the IEC Project on Pennsylvania would be especially harmful. Assuming PJM's analysis is correct, the IEC Project would increase wholesale power prices to load-serving entities in Pennsylvania by approximately $429 million, which would negatively affect the price of electricity for retail customers.

Approving a transmission siting project solely on the basis of market efficiency concerns is a matter of first impression before this Commission. Whether or not such projects can meet Pennsylvania legal or regulatory requirements, the facts presented here certainly do not rise to that level. Accordingly, the IEC Project is not needed and should be denied.

C. RISKS TO HEALTH AND SAFETY OF THE PUBLIC

The OCA is not addressing this issue. The OCA's lack of discussion should not be interpreted as acceptance of the Company's position.

D. ENVIRONMENTAL IMPACTS

The Commission's regulations provide the necessary findings that the Commission must make and the evidence that will be considered in deciding whether to approve this Project. Key among those areas are the potential environmental impacts, specifically that the Project complies "with applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth", and that "it will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives." 52 Pa. Code § 57.76(a)(3),(4). In reaching these determinations, the Commission will consider the evidence of record that is relevant to potential environmental impacts of the Project. 52 Pa. Code § 57.75(e)(1-3).

In light of the demonstrated public interest in the proceeding, eight public input hearings were convened in 2018, four in York County on May 9 and 14 and four in Franklin County on May 22 and 23. In all, approximately 250 witnesses testified at those public input hearings.

Subsequently, on May 29 and 30, on-site hearings were held in Franklin County and on June 1, hearings were convened in York County for the purpose of receiving sworn testimony by all of the affected landowners who requested a site visit. During those three days of on-site hearings, approximately 33 witnesses offered sworn testimony relevant to the impacts on the use and enjoyment of their land, the loss of agricultural productivity, negative impacts on businesses and communities, impacts on the viewsheds, the well water quality, detrimental effects upon protected waterways and historic sites, among other adverse effects. Four additional public input hearings were convened after the site visits, two in Franklin County on September 18, 2018, and two in York County on September 20, 2018, to provide the public an additional opportunity to testify.

In addition to its regulations, the Commission must be guided in its decision here by the Environmental Rights Amendment codified as Article 1, Section 27 of the Pennsylvania Constitution. The Environmental Rights Amendment protects the rights of Pennsylvanians to clean air, pure water, and the preservation of the environment, while also requiring the Commonwealth to conserve and maintain the public's natural resources for the benefit of all Pennsylvanians.[43] Pa. Const., Art. 1, § 27.

The record in this matter is replete with evidence as to the impacts that this Project would have on the environment of Pennsylvania. Of the thousands of pages of transcript that have been produced in this matter, a large portion relates to the hundreds of witnesses who provided sworn testimony at the various public input hearings. Many of these witnesses are landowners who would be directly impacted by this Project.[44] A portion of those sworn testimonies are recounted here.

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[43] See Section V.A of the OCA's Brief, supra. In considering the Environmental Rights Amendment to the matter at hand, the Commission must also recognize the mandates established by the Pennsylvania Supreme Court in PEDF. 161 A.3d 911.

[44] The OCA notes that the Amended Application and the revised Project scope for the Eastern part of the Project has mitigated some of the impacts that would have been experienced in York County. Nevertheless, the

1. Excerpts from the Franklin County Public Input Hearings.

Mr. Rob Kauffman testified as follows:

To me it is crystal clear that the costs to Franklin County residents far outweigh the benefits of construction of the new line. I can personally attest that the viewscapes across our pristine farmlands and neighborhoods will be compromised. The proposed line runs approximately 500 feet from my home and will affect my line of sight in all directions.

My situation is not uncommon with this proposed project. It will be replayed across many households in Franklin County. This project will cut a path of over 24 miles through the heart of Franklin County through Greene, Guilford, Quincy, and Washington Townships. As this project crosses these municipalities, it will negatively impact residential developments, intersect prime farmland, and reduce the potential for development on premium land in Franklin County.

There are also concerns about potential damage to our ecosystem and health as the proposed route traverses the Falling Spring watershed and the Chambersburg High School cross country track within the distance of a few football fields. For perspective, the Falling Spring branch is a limestone-fed spring that is widely considered one of the most abundant waterways on the East Coast for wild rainbow trout.

Given the environmental concerns presented by high voltage transmission lines as well as current State mandates related to energy conservation, energy and efficiency, and renewable energy resources, I question whether there is a true need for this line.

I'm also concerned that Transource has rejected a less impactful local route alternative that would travel through mountain ground east of our large population centers and would directly affect fewer residents. It seems apparent that Transource has chosen a less costly route that satisfies the objectives of national environmental lobbying organizations at the expense of our local community which will receive no direct benefit from the line.

Electric consumers in Franklin County will not realize any cost savings once the line is operational. Zero. The proposed line is being constructed for the benefit of Maryland and DC suburbs while all the impacts will be absorbed by the residents of Franklin County.

substantial expansion of the right-of-way for PPL's dormant transmission line and the rebuild of existing lines will have environmental impacts that should be considered.

It's unreasonable to expect us to accept decreases in our property values, diminished economic development, and permanent changes to our picturesque landscape and not be a direct recipient of the lower cost electricity that will come from increasing transmission capacity.

The route proposed by Transource is completely unacceptable and does not serve the public interest. Transource has failed to demonstrate any need for a new transmission line that travels through the heart of Franklin County. I oppose the Transource application and ask that it be rejected by the Commission.

Tr. at 1009-1012.

Mr. Lantz Sourbier testified as follows:

I've lived in this valley in this community in Guilford Township all but four years of my life, and that's when I left to serve in the military. This is a very special place.

I have a profound concern the proposed power line will cross the Falling Spring at a location known locally as Skelly Meadows, a place where I recall catching my first trout as a young boy and a place where Jimmy Carter, President Jimmy Carter fished. Since then the Falling Spring branch has been recognized by the PA Fish and Boat Commission and the Department of Environmental Protection as follows.

It's a high quality cold water fishery. It's a heritage trout spring. It's a limestone spring-fed stream. It's a natural trout reproduction limestone stream.

…

I have to ask you, is it really worth it? Is it worth it to put this power line across a gem like this? Is it worth it to feed power into the DC metro area?

Tr. at 1014-1015, 1016.

Ms. Jane Glenn testified as follows:

Farms in our area are passed down from generation to generation. The proposed power lines will be taking away large portions of our farmers' land and impacting their ability to farm unimpeded. Our farmers deserve the respect they have earned for over 200 years of giving to our community.

Tr. at 1043.

Mr. Sherwin Brechbill testified as follows:

Being a self-employed dairy farmer, I know there's a lot of concern of stray voltage of these high transmission lines. Dairy animals are ten times more susceptible to

shocks and stray voltage than the humans are; and Franklin County being the second largest population area second to Lancaster, Pennsylvania, that's a large concern.

I learned this proposed power line coming through, oh, my goodness, they got to strongly reconsider this. We are a very large dairy enterprise in this county, and it's a large concern of mine; and there's many other businesses that will be affected over that, too. So I just strongly encourage you to consider opposing this operation.

Tr. at 1085.

Mr. Doug Wolfgang testified as follows:

I'm the Director of the Bureau of Farmland Preservation. My reason for being here today is just to express our concern about the loss of farmland due to any project. In particular, Pennsylvania leads the nation in preserving farmland. We've invested over $1.5 billion at this point in preserving nearly 550,000 acres and over 5,200 farms. York and Franklin Counties are leading counties in the state in that effort.

Just to bring to your attention that the taxpayers of Pennsylvania and the citizens are very aware of where we've made these investments, and I just ask that you give that strong consideration in the decision-making for these projects.

Tr. at 663.

2. Excerpts from the York County Public Input Hearings.

Mr. Jeff Grove testified as follows:

I am Jeff Grove Director of Local Government Affairs with the Pennsylvania Farm Bureau. The Pennsylvania Farm Bureau is the state’s largest farm organization with nearly 62000 farm and rural families statewide, representing all commodities and types and sizes of farms.

…

Farmers in Pennsylvania have committed more land to conservation easements than has any other state. Pennsylvania farmers pioneered farmland preservation because Pennsylvania farmers are committed to protecting Pennsylvania's agricultural economy and protecting prime farmland. To date 5,297 farms have been approved for easement purchases totaling almost half a million acres. York County has preserved 283 farms and nearly 42,000 acres.

…

The PUC must consider the impacts on future viability of farms, and especially those that have been preserved under Pennsylvania's Farmland Preservation Program. Pennsylvania farmers that have sold their development rights through the Pennsylvania Farmland Preservation Program are bound by their agreements for perpetuity.

Decisions regarding right-of-ways, especially through preserved farmlands can threaten the future viability and ability to continue operating and support of the families that own them. Preserved farms need the ability to change operations, add or remove buildings, and address general market needs as the property-owners' needs and markets require.

Tr. at 327-330.

State Representative Kristin Phillips-Hill testified as follows:

I'm State Representative Kristin Phillips-Hill. I represent the 93rd District here in southern York County, and today I rise to provide public testimony in opposition to the proposed Transource project identified in PUC docket number A-2017-2640195. This project will not provide long-term significant benefits to our local Pennsylvania communities economically nor preserve our tremendous agrarian heritage and scenic beauty.

…

This project is designed to benefit consumers in other states which are experiencing higher energy costs from congestion in the energy grid. This market efficiency problem is not a power issue for York County residents, and no residents are experiencing outages because of is congestion. Nor do I see that this project will aid our local Pennsylvania communities with reduced electric costs.

While Transource is proposing to export our low-cost power to other markets, to do so would be to the detriment of our preserved natural beauty, our economic base of small family-owned farms, and our agricultural tourism. York County is proud of its strong preservation heritage with nearly 42,000 acres and 282 farms in perpetual easements for the benefit of future generations.

…

Under Article I, Section 27 of our State Constitution, we are trustees to the people's right to the preservation of natural, scenic, historic, and aesthetic values of the environment for future generations. And I quote, as trustees of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

Tr. at 102-105.

3. Conclusion.

The preceding examples are representative of the voluminous public testimony in this matter as to the environmental impacts on Pennsylvania's natural and historic resources should this Project be approved. The OCA respectfully submits that Transource bears a heavy burden under the Commission's Regulations, the Environmental Rights Amendment and the PEDF Decision as to the approval of this Project. In accord with the weight of the public testimony, and the prevailing laws of Pennsylvania, that burden has not been carried here.

E. AVAILABILITY OF REASONABLE ALTERNATIVES

1. PJM's Selection Process is Restrictive In That It Only Considers Submitted Proposals and Transmission Solutions.

Pursuant to Section 57.76(a) of the Commission's regulations, the Company must demonstrate that the IEC Project will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives. 52 Pa. Code § 57.76(a)(4). The OCA submits that PJM's proposal process, which Transource relies upon to demonstrate that the IEC Project is the most reasonable alternative to address congestion on the AP South Reactive Interface, is restrictive, narrow, and limited, preventing this Commission from considering the best potential solutions with the least harmful environmental effects. The evidence demonstrates that PJM solely relies on market efficiency solutions submitted by third parties and does not itself identify potential solutions. This process prevented PJM from considering the use of existing transmission facilities owned by PPL to address the issue, which is now included as part of the alternative configuration of the East Portion

of the IEC Project as a result of efforts by the affected communities and the OCA, or consider the benefits of additional generation sited in the constrained area.[45]

Pursuant to its Operating Agreement, PJM can approve and direct new transmission system enhancements or expansion to existing transmission facilities designed to address congestion issues. As stated in PJM's Operating Agreement, it can consider three types of solutions:

> Following PJM Board consideration of the assumptions, the Office of the Interconnection shall perform a market efficiency analysis to compare the costs and benefits of: (i) accelerating reliability-based enhancements or expansions already included in the Regional Transmission Plan that if accelerated also could relieve one or more economic constraints; (ii) modifying reliability-based enhancements or expansions already included in the Regional Transmission Plan that as modified would relieve one or more economic constraints; and (iii) adding new enhancements or expansions that could relieve one or more economic constraints, but for which no reliability-based need has been identified.

Transource St. 7-R, Exh. SRH-3R at 10. There are, however, several limitations.

First, PJM can only consider solutions that have been submitted as part of its competitive bidding process. As explained by Company witness Herling:

> PJM's competitive solicitation planning process is based on a sponsorship model, meaning that PJM must consider only those project proposals as submitted through its competitive proposal windows. All project proposals submitted are reviewed by PJM and presented to the [Transmission Expansion Advisory Committee (TEAC)].

Transource St. 7 at 27-28. Accordingly, if a proposal was not submitted, it is not reviewed by PJM. As further explained by Company witness Herling in response to cross-examination by OCA counsel:

> THE WITNESS: The competitive model that PJM uses for resolving issues such as the congestion on the AP South Interfaces is referred to as a sponsorship model. Our job, PJM's job, is to identify needs, that could be a reliability criteria violation or it could be, in this case, congestion on the grid, and we solicit solutions from qualified transmission developers.

[45] The Company's alternative configuration of the East Portion of the IEC Project does not equate to a finding of need or that the IEC Project will have minimum adverse environmental impact or that it is the most reasonably available alterative. As the OCA will demonstrate in this section, PJM's selection process is restrictive and non-transmission alternatives exist to alleviate any remaining congestion on the AP South Reactive Interface.

> In this case, we held a window over the months of November through February of 2014 into 2015 for a large number of constraints on the system, market efficiency needs or derivers. I believe we received 93 different proposal, 41 of which were specifically related to the congestion on the AP South Interface.
>
> The model is called a sponsorship model because PJM's job is to look at the proposals that are submitted, identify the most effective and efficient solution, and the party who has submitted that proposal or sponsored that proposal is then designated to construct and later own, maintain and operate that facility. In this case, that party is Transource Pennsylvania in the Pennsylvania portions and Transource Maryland for the Maryland portions.
>
> JUDGE BARNES: When you say best proposal, do you mean the best of the ones submitted?
>
> THE WITNESS: Yes.

Tr. at 2272-73.

It should be noted that PJM's sponsorship model was voluntarily chosen by PJM when enacting FERC Order 1000.[46] California's independent system operator, CAISO, implemented a 'Procurement Model.' As further explained by Company witness Herling in response to cross-examination from OCA counsel:

> Q. Mr. Herling, I can't think of what it would be called, but there is an alternative to the sponsorship model that has been adopted by other ISOs or RTOs ln which a solution is designed by the RTO and then it is put out for bid to entities that could potentially then construct that solution; is that correct?
>
> A. Yes. I don't know what they --the other entities like the California ISO, for example, have such a model. We in PJM refer to that as a procurement model. California ISO would identify what they believe to be the most effective solution and then put it out for bid.

Tr. at 2275.

In addition to this limitation, PJM can only consider transmission solutions either through upgrades of existing facilities or new expansions. Transource St. 7-R, Exh. SRH-3R at 10. For

[46] FERC Order 1000 is a landmark FERC Order that reinforced and encouraged competitive solutions to regional transmission issues.

this reason, PJM never considered whether a non-transmission solution with less environmental impact or a more cost-effective solution in the constrained region could appropriately address congestion on the AP South Reactive Interface. As an example, PJM did not consider whether additional low-cost generation resources sited in the constrained area could be a sufficient remedy to the perceived congestion. PJM's reason for not investigating the benefits of additional low-cost generation in the constrained area is simply because it cannot require it to be built. As stated by Company witness Herling:

> Q. OCA Witness Crandall states that it makes sense to build supply in constrained areas with higher LMPs. OCA St. No. 3SR, p. 12. What is wrong with this reasoning?
>
> A. PJM cannot require generation to be built, let alone to be built in a specific locale.

Transource St. No. 7-RJ at 8.[47] This reasoning is not sufficient for ruling out potential solutions, especially when considering that Company witness Horger acknowledged the potential benefits of additional generation in the constrained area. As stated by Mr. Horger in response to cross-examination:

> Q. Okay. And these other congestion facilities, is there also a lack of generation observed in those areas?

[47] The OCA also submits that market efficiency projects designed to alleviate congestion can usurp traditional market price signals that are designed to spur investment in lower-cost generation in the constrained region. The Independent Market Monitor has expressed similar concerns in its First Quarter 2020 State of the Market Report:

> The current market efficiency process does exactly the opposite by permitting transmission projects to be approved without competition from generation. The broader issue is that the market efficiency project approach explicitly allows transmission projects to compete against future generation projects, but without allowing the generation projects to compete. Projecting speculative transmission related benefits for 15 years based on the existing generation fleet and existing patterns of congestion eliminates the potential for new generation to respond to market signals. The market efficiency process allows assets built under the cost of service regulatory paradigm to displace generation assets built under the competitive market paradigm.

OCA Hearing Exh. 6 at 72-73.

A. If you're saying that if there was congestion, enough [generation] in the proper location in those areas that could run in the PJM market and reduce congestion, potentially.

Q. Yeah. I guess I'm asking, if there were additional generation close to those congested areas that you're identifying in addition to the AP South.

A. If they were in the proper location with enough megawatts or enough power, potentially.

Tr. at 2648-49 (as corrected by the Order Correcting Hearing Transcripts entered Mar. 18, 2019).

PJM's selection process is restrictive. By relying on a sponsorship model, PJM prevents itself from engaging in its own analysis of the bulk electric grid to determine the best solution. Rather, it only relies on what is submitted by third parties. Such a process prevented PJM from considering using existing transmission facilities owned by PPL and the potential benefits of additional generation sited in the constrained areas.

2. Non-Transmission Alternatives

*a. Introduction*

Transource has proposed this Project as a means to address congestion concerns on a series of 500kV lines located south of Pennsylvania, identified as the AP South Interface. According to Transource and PJM, the ability to send power over the AP South Interface to the load centers primarily located in the service territories of BG&E, PEPCO and Dominion is being constrained due to congestion on these 500kV lines.

As the Commission's regulations provide, the Commission must also consider reasonable alternatives to the project being proposed. 52 Pa. Code § 57.76. The OCA retained Mr. Geoffrey C. Crandall of MSB Energy Associates to aid in its investigation of the proposed Project. Mr. Crandall's focus in this matter has been to analyze and investigate whether non-transmission alternatives to the Project, such as energy efficiency, renewable energy and distributed generation resources have been adequately analyzed and accounted for as possible alternatives to the proposed

Project. In his Direct Testimony, Mr. Crandall provided the following concerns and issues regarding PJM's study and modelling of non-transmission alternatives:

- Non-transmission alternatives including energy efficiency programs, demand response, distributed generation, solar, wind resources in the areas where higher (Locational Marginal Prices) LMP's are projected due to congestion.

- We have identified resources that are available in the transmission-constrained areas, which impact the economics of IEC Project.

- In our review of PJM's model outputs, which PJM used to select the IEC Project, we have determined that transmission congestion and higher electric prices as modeled occur not only at time of peak, but also deeper into the intermediate and base load levels. As such, the constraints as modeled could occur many hours each year. The actual hours of constraint, however, have declined substantially since the time the IEC Project was approved.

- Energy efficiency, distributed generation (including combined heat and power - CHP) and renewable resources have the potential to materially reduce the transmission congestion and thus the electricity prices in the D.C.-Maryland-Virginia areas.

- Energy efficiency resource potential is present both East and South of PA and has not been adequately accounted for in the PJM forecast.

- Renewable resources, especially solar (Photo Voltaic) PV and wind are also available in the IEC Project area. These resources were not given due consideration in the PJM forecast.

- Other distributed generation resources are site and process specific but have been estimated by Federal Government sources and may also have a material impact on the economic viability and need for the IEC Project.

- In this testimony I provide an assessment of whether or not energy efficiency, renewable energy and distributed generation resources would be available to substantially affect the need for and reduce the benefits of the proposed transmission project.

OCA St. 3 at 3-4.

As discussed in the following sections, Mr. Crandall's analysis and conclusions as to the merits of non-wires alternatives in this matter are reasonable and well supported. When the current levels of congestion are reviewed, the initiatives in the affected states for further development of

energy efficiency and renewables are considered, and the cost of this project assessed, the OCA submits that non-wires alternatives as Mr. Crandall discusses in his testimonies are even more of a reasonable path forward.

*b. Congestion Issues*

As set forth above and as Mr. Crandall testified, the level of congestion and the associated costs of that congestion on the AP South Interface have dropped by over 90% since the 2014-2015 timeframe. OCA St. 3 at 10-12. The persistent and high levels of congestion that gave rise to this Project, simply, *no longer exist*. Moreover, more recent numbers from the IMM market updates show that congestion on the AP South Reactive Interface has continued to drop and for 2019 the total congestion cost was $14.5 million.[48] The most recent update from the IMM covers the first three months of 2020. As with the 2019 Report, the IMM lists the top 25 constraints in PJM for this latest time period. AP South showed congestion costs for the entire year of 2019 at only $14.5 million. At that low number, it was listed as the 6th most congested facility in PJM. In the most recent 2020 Quarterly Report, AP South does not crack the top 25. It is not listed. OCA Hearing Exh. 6 at 559

OCA witness Crandall's testimony is even more relevant and persuasive considering these newest congestion numbers. As Mr. Crandall testified:

> **Q. How did the dramatic decline in congestion event hours affect your analysis of non-transmission alternatives?**
>
> A. First, the decline in the number of congestion event hours and the congestion costs reduces the severity of the problem and the benefits derived from resolving the problem. *In other words, the amount of money that could or should be invested to resolve the congestion problem is greatly reduced.* That would apply to transmission as well as non-transmission alternatives.

[48] See Monitoring Analytics, LLC, *2019 State of the Market Report for PJM* at 543, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2019/2019-som-pjm-sec11.pdf (last visited Aug. 10, 2020).

OCA St. 3 at 12 (emphasis added).

To the extent that there is a continuing concern over these levels of congestion in the study areas, there are alternative means to address congestion that do not involve building new transmission lines. As Mr. Crandall testified:

> PJM's solution is to seek a more balanced transmission network to reduce market inefficiency. PJM's preferred solution here is to build more transmission lines to reduce the transmission constraints and thus enhance the efficiency of the electricity market. This is neither the only solution, nor in this case, the best solution.
>
> …
>
> **Q. The proposal in this case is to construct additional transmission to address the identified transmission congestion. Is construction of transmission the only solution?**
>
> A. No. Depending on the facts, other non-transmission alternatives can be employed to materially affect the congestion levels at issue here and thus also materially impact the need to build new transmission infrastructure.
>
> **Q. What non-transmission alternatives to the IEC Project have you considered?**
>
> A. I have considered expanded end-use energy efficiency measures, expanded demand response programs, expanded renewable resource programs, and expanded distributed resource programs.

OCA St. 3 at 6-7.

As Mr. Crandall testified, the expanded use of energy efficiency measures, renewable resources and distributed generation can have a material impact on congestion levels, and thus the need to build any new transmission lines. Further, the alleged beneficiaries of the Project, Maryland, Virginia and Washington D.C. have all embarked on various initiatives to reduce demand, create more local renewable generation projects and all these areas have introduced some form of a zero-carbon energy future in the near-term horizon. In the following section, these non-wires solutions will be described in further detail.

*c. Alternative Solutions to Building New Transmission are Reasonable, Cost Effective, and are a Better Choice to Deal with the Low Levels of Congestion in the Subject Area.*

As discussed earlier, higher demand for energy gives rise to congestion. This situation on the bulk electric system is really no different than traffic congestion on a highway. During times of high use (demand), traffic slows and becomes congested. Persistent long-term congestion can lead planners to decide that a new or expanded highway may be needed. But, other, more cost-effective options, like increased use of Public Transportation, carpooling and telecommuting can have the same effect as spending hundreds of millions of dollars to build new infrastructure – these measures reduce demand. Deploying like measures to the bulk electric system, as Mr. Crandall described in his testimony, will reduce demand and thus lessen congestion.

As PJM has stated throughout this matter, the Project was designed to address the metropolitan areas to the south of Pennsylvania. As Mr. Crandall testified, these areas were the focal point for his investigation:

> **Q. What were your design targets for the non-transmission alternatives?**
>
> A. I looked for resources that could be located to the east and south of the AP South Reactive Interface, generally northern Virginia, Maryland and District of Columbia.
>
> I looked for any resource available any time of day or year, but considered those resources available between 7AM and 10PM to be typically more valuable as an alternative to the IEC Project.

OCA St. 3 at 14-15. Specifically, Mr. Crandall identified the following:

- Energy Conservation (EC) can be defined as the reduction in the amount of energy consumed in process or system, or by an organization or society, through economy, elimination of waste, and rational use.

- Energy efficiency (EE) can be defined as a percentage of total energy input to a building, machine or equipment that is consumed in useful work and not wasted as useless heat. This definition pertains to homes, businesses, cooled air and heated water and a multitude of end uses and generally means to do more with the same

or a lesser amount of energy without amenity loss. New Home construction, high efficiency lighting, air conditioning, and refrigerators are all examples of commonly employed strategies to promote energy efficiency.

- Demand Response (DR) can be defined as a means for consumers to impact the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives. Methods of engaging customers in demand response efforts include time-sensitive rates such as critical peak pricing, real time pricing, time-of-use pricing, variable peak pricing, critical peak rebates and other options.

OCA St. 3 at 15-16. In addition to these measures that can significantly reduce the demand for electricity, and thus lessen congestion, there are also localized renewable resources available that can supplant the need to import large amounts of electricity into these metropolitan areas, as follows:

- Solar: Solar resources can be either utility scale or small scale and typically customer owned. Solar cells are used to generate electricity from sunlight. It is a device that converts light energy into electrical energy. Solar energy is a flexible energy technology, which can be built as distributed generation (located at or near the point of use) or as a central-station, utility-scale solar power plant (similar to traditional power plants). Both of these methods can also store the energy they produce for distribution after the sun sets using storage technologies.

- Wind Energy Resources can be defined as wind power, a widely applied and accepted renewable energy resource. Historically, wind power in the form of windmills has been used for centuries for such tasks as grinding grain and pumping water. Modern commercial wind turbines produce electricity by using rotational energy to drive an electrical generator. Wind energy can also be stored using battery storage technologies and distributed after the wind dissipates.

- Renewable energy storage is typically referred to as Battery Storage. It is a device that reserves energy for later consumption and is charged by a connected solar or wind system. The stored electricity can be consumed after sundown, the wind dissipates, during energy demand peaks, constrained/congested transmission conditions or during a power outage.

OCA St. 3 at 16-17. As OCA witness Crandall testified, there are a variety of measures that can be employed on a broad scale that will substantially impact the need for electricity and the need to

transport large amounts of electricity over long distances. As is clear from the record evidence, however, PJM has not adequately considered these non-wires alternatives. See e.g., OCA St. 3 at 17-27.

Mr. Crandall testified to the shortcomings in PJM's analysis, as follows:

> **Q. Did PJM analyze and assess increased energy efficiency resource strategies as a potential non-wires alternative in assessing the economic viability of the IEC Project?**
>
> A. Not that I am aware of. See Exhibit OCA-3-3 wherein the Company response to OCA's discovery question OCA-IV-24 was that "The Company lacks information to form a belief about the conduct of other electric utilities. The Company further states that levels of energy efficiency, demand responses, wind resources, solar resources and other distributed energy resources are assumptions incorporated into PJM's RTEP at the start of the RTEP process cycle pursuant to PJM's Operating Agreement, Schedule 6, 1.5.3."
>
> However, in my review of the analytics that were done when PJM was considering the various congestion reduction projects, I saw no evidence that PJM assessed the need for the IEC Project with and without significantly increased levels of energy efficiency resources e.g., commercial lighting in the congested zones.

OCA St. 3 at 17. Mr. Crandall went on to testify that PJM also failed to adequately investigate or analyze the increased levels of renewable resources and storage potential in the areas under review. As OCA witness Crandall testified:

> Q. **Did PJM analyze and assess increased solar and wind renewable resources (in combination with storage systems) as a potential non-wires alternative in assessing the economic viability of the IEC Project?**
>
> A. Not that I am aware of. See Exhibit OCA-3-3 wherein the Company response to OCA's discovery question OCA-IV-24 was that "The Company lacks information to form a belief about the conduct of other electric utilities. The Company further states that levels of energy efficiency, demand responses, wind resources, solar resources and other distributed energy resources are assumptions incorporated into PJM's RTEP at the start of the RTEP process cycle pursuant to PJM's Operating Agreement, Schedule 6, 1.5.3." However, in my review of the analytics that were done when PJM was considering the various congestion reduction projects, I saw no evidence that PJM assessed the need for the IEC Project with and without significantly increased levels of distributed resources e.g., Utility scale wind resources in the congested zones.

OCA St. 3 at 18. In addition, PJM failed to adequately investigate or analyze available levels of distributed generation or any state actions involving energy efficiency or renewable resources in the study area. Mr. Crandall testified as follows:

> **Q. Did PJM analyze and assess increased Distributed Generation resource strategies as a potential non-wires alternative in assessing the economic viability of the IEC Project?**
>
> A. Not that I am aware of. See Exhibit OCA-3-3 wherein the Company response to OCA's discovery question OCA-IV-24 was that "The Company lacks information to form a belief about the conduct of other electric utilities. The Company further states that levels of energy efficiency, demand responses, wind resources, solar resources and other distributed energy resources are assumptions incorporated into PJM's RTEP at the start of the RTEP process cycle pursuant to PJM's Operating Agreement, Schedule 6, 1.5.3." However, in my review of the analytics that were done when PJM was considering the various congestion reduction projects, I saw no evidence that PJM assessed the need for the IEC Project with and without significantly increased levels of distributed generation resources.
>
> **Q. Did PJM include state energy efficiency or renewable resource mandates and requirements in conducting its analysis to approve the IEC Project?**
>
> A. No. OCA XIII-14 indicated that PJM had not conducted studies to identify the impact of existing or imminent state-approved utility programs for energy efficiency, demand response, CHP or renewable resources as it relates to the need for the IEC Project. See Exhibit OCA-3-4.

OCA St. 3 at 18-19.

OCA witness Crandall, however, testified as to the various programs being put in place in the target areas. As to Virginia, Mr. Crandall testified as follows:

> **Q. Is information available regarding the potential for Energy Efficiency and Renewable resources in Virginia?**
>
> A. Yes. The Virginia General Assembly earlier this year, adopted a law that encourages the increased reliance on renewable energy and energy efficiency resources by passing the Grid Transformation and Security Act of 2018 (the "GTSA"), which became effective in March 2018. The new law finds that up to an additional 5,000 MW of utility-scale electric generating facilities powered by solar and wind energy is in the public interest, and in addition finds that an additional

500 MW of non-utility scale solar or wind generating facilities, including rooftop solar installations are in the public interest.

The GTSA also encourages increased demand-side management programs to help customers conserve energy and reduce system peak loads. This law will cause the implementation of energy efficiency and demand response programs capable of reducing customers' overall annual energy usage by 805 gigawatt-hours (GWh) and system peak demand by 304 MW by 2033.

The GTSA requires Virginia Power Company (Dominion) to commit at least $870 million to implement energy efficiency programs for the period beginning July 1, 2018, and ending July 1, 2028, which includes Virginia Power's existing energy efficiency programs.

**Q. Why is the passage of the GTSA in Virginia relevant to the IEC Project?**

A. It is relevant for several reasons.

- Virginia is in the target zone for locating alternative non-transmission resources that would unload the congested transmission lines of the AP South reactive Interface. GTSA will reduce the load in Virginia, and thus will tend to mitigate congestion levels on the AP South Reactive Interface, which would reduce the projected market inefficiency. Accordingly, the implementation of GTSA will reduce the purported benefits (and need for) the IEC Project.

- The largest beneficiary of the IEC Project, as modeled by PJM, is Dominion, which is also the largest electric distributor in Virginia. In 2016, Dominion sold or distributed 68% of the electricity consumed in Virginia. Being the largest beneficiary of the IEC Project means that Dominion is the zone most adversely affected by the congestion – it faces the highest duration and/or magnitude and/or price differentials due to transmission congestion. This means actions reducing loads at Dominion will relieve the congestion on the AP South Reactive Interface. Because of Dominion's dominance as an electricity supplier in Virginia, a statewide action such as GTSA will have a profound impact on Dominion.

- The GTSA is proof that States and utilities in the PJM footprint are serious about energy efficiency and renewable energy and are taking actions to achieve more of it. Energy efficiency and renewable energy are not merely potentials, but will be profoundly affecting the loads and load shapes PJM will attempt to serve.

- The impacts of the GTSA on reducing load in the target area and relieving transmission congestion were not considered by PJM, neither when the IEC

Project was selected nor in any of the re-evaluations, including the one most recently presented to the TEAC on September 13, 2018.

**Q. How much would you expect GTSA to reduce Dominion's forecasted loads?**

A. With 68% of Virginia's load in Dominion's service territory, I would expect about 68% of the GTSA targets to be achieved in Dominion's service territory. Dominion's load would be reduced by 206 MW and 545 GWH/year as a result of energy efficiency and 3,723 MW as a result of renewable energy. Using a conservative assumption that on average wind and solar generation has a capacity factor of 20%, the renewable energy sources would reduce Dominion's annual energy needs by 6,523 GWH. These are significant reductions.

OCA St. 3 at 19-22.

As Mr. Crandall discussed, this Virginia law was passed in March, 2018. The implementation of this law will significantly affect energy usage in Virginia, especially for the State's largest provider, Dominion. In PJM's modelling, Dominion is the single largest "beneficiary" of the Project, yet, even though this law was passed in March 2018 subsequent evaluations and re-evaluations of the Project by PJM fail to account for the energy reductions that will occur in Virginia. Mr. Crandall's testimony and conclusions as to the fact that PJM has not sufficiently modelled this changing energy landscape in Virginia is well founded.

Similar to Virginia, Mr. Crandall undertook an analysis and investigation as to energy efficiency and conservation measures being enacted in Maryland. Specifically, Mr. Crandall testified as follows:

**Q. Is information available regarding the potential for Energy Efficiency and Renewable resources in Maryland?**

A. Yes. The Maryland Legislature passed a law in April 2017 that mandated a 2% per year reduction in electric energy use. With Maryland's electric energy use in 2016 at over 93,000 GWH, the 2% mandate would be 1,868 GWH.

**Q. Why is this activity in Maryland relevant to the IEC Project?**

A. It is relevant for several reasons.

- Maryland is in the target zone for locating alternative non-transmission resources that would unload the congested transmission lines and thus will tend to mitigate congestion levels on the AP South Reactive Interface. Efforts to reduce the load in the Maryland would mitigate the congestion, which would reduce the projected market inefficiency. It would reduce the purported benefits of the IEC Project.

- The third largest beneficiary of the IEC Project, as modeled by PJM, is BGE, which is also the largest electric distributor in Maryland. In 2016, BGE sold or distributed 32% of the electricity consumed in Maryland. Being a large beneficiary of the IEC Project means that BGE is adversely affected by the congestion. Actions reducing loads at BGE will relieve the congestion on the AP South Reactive Interface.

- The statutory efficiency mandate is proof that States and utilities in the PJM footprint are serious about energy efficiency and renewable energy and are taking actions to achieve more of it. Energy efficiency and renewable energy will be profoundly affecting the loads and load shapes PJM will attempt to serve.

- It is unclear whether and how this Maryland energy efficiency mandate was incorporated into PJM's planning. Clearly it was not included in the forecasts when the IEC Project was selected, as the selection process predated the legislation. However, the impacts of this legislation may not have yet fully made their way into the end use energy intensity trendlines utilized in PJM's recent forecasting models.

**Q**. How much would you expect energy efficiency and renewable energy initiatives in Maryland to reduce BGE's forecasted loads?

A. With 32% of the load in the Maryland, I would expect about 32% of the captured load to be BGE's load. BGE's load would be reduced by about 600 GWH annually as a result of energy efficiency. Assuming BGE's energy efficiency programs would deliver results similar to Dominion's, energy efficiency would reduce BGE's peak demand by about 227 MW.

OCA St. 3 at 24-25.

As Mr. Crandall testified, Maryland passed an aggressive energy reduction program in 2017 that will directly affect energy usage in the BG&E service territory.[49] According to PJM's

[49] H.D. 514, 437th Gen. Assemb., Reg. Sess. (MD. 2017). The Bill passed 5-27-2017. SB 814, which became law is available at:
https://legiscan.com/MD/text/SB184/2017

modelling, the BG&E service territory is alleged to be one of the largest beneficiaries of the Project. The mandated state energy reductions, year-by-year, will reduce energy usage in the BG&E service territory and consequently reduce the need for energy imports, again, lowering congestion levels. As with Virginia, the OCA submits that PJM has not adequately studied or considered the continuing need for this Project in light of the robust energy reduction measures being taken directly in the target area.

OCA witness Crandall also reviewed and analyzed the emerging energy landscape and policy measures in D.C. Mr. Crandall testified as follows:

> Q. **Has the District of Columbia undertaken an assessment of energy efficiency and renewable resources in the District of Columbia**?
>
> A. Yes. The District of Columbia's Department of the Environment conducted an analysis wherein they quantified the economic energy efficiency potential in the District of Columbia to be 5,537,521 MWh/yr in 2022. In addition the District of Columbia's Department of the Environment estimated that there is a technical potential of 2,498,000 MWh/year for rooftop PV and Urban Utility scale PV potential in the District of Columbia.
>
> **Q. Why is this activity in the District of Columbia relevant to the IEC Project?**
>
> A. It is relevant for several reasons.
>
> - The District of Columbia is in the target zone for locating alternative non-transmission resources that would unload the congested transmission lines and thus will tend to mitigate congestion levels on the AP South Reactive Interface. Efforts to reduce the load in the District of Columbia and mitigate congestion would reduce the projected market inefficiency. It would reduce the purported benefits of the IEC Project.
>
> - The second largest beneficiary of the IEC Project, as modeled by PJM, is PEPCo, which is also the largest electric distributor in the District of Columbia. In 2016, PEPCo sold or distributed 58% of the electricity consumed in D.C. Being the second largest beneficiary of the IEC Project means that PEPCo is adversely affected by the congestion. Actions reducing loads at PEPCo will relieve the congestion on the AP South Reactive Interface.

- The District of Columbia City Council recently determined that by 2032 half of the electric energy used in the District of Columbia should be supplied by solar photovoltaics. With electric sales in the District in 2016 being nearly 20,000 GWH, half of the energy from renewables would amount to about 10,000 GWH. Again, this is proof that States and utilities in the PJM footprint are serious about energy efficiency and renewable energy and are taking actions to achieve more of it. Energy efficiency and renewable energy will be profoundly affecting the loads and load shapes PJM will attempt to serve.

**Q. How much would you expect energy efficiency and renewable energy initiatives in the District of Columbia to reduce PEPCo's forecasted loads?**

A. I have assumed that 15% of the economic potential for energy efficiency as quantified by District of Columbia's Department of the Environment would be captured. With 58% of the load in the District of Columbia, I would expect about 58% of the captured load to be PEPCo's load. PEPCo's load would be reduced by 479 GWH annually as a result of energy efficiency. I assumed that 5% of the renewable energy technical potential as quantified by District of Columbia's Department of the Environment would be captured, yielding 72 GWH of renewable energy. Assuming PEPCo's energy efficiency programs would deliver results similar to Dominion's, energy efficiency would reduce PEPCo's peak demand by 181 MW. Using a conservative assumption that on average wind and solar generation has a capacity factor of 20%, the renewable energy sources would add about 41 MWs of capacity.

OCA St. 3 at 22-24.

As Mr. Crandall has shown, the combination of energy efficiency and aggressive deployment of solar will substantially impact the energy usage and energy flows in PEPCo's service territory. According to PJM's modelling, PEPCo is the second largest beneficiary of the Project. Yet, similar to Virginia and Maryland, PJM has not adequately studied the continued need for this Project considering the rapidly evolving energy policies and programs being implemented in the target areas.

Mr. Crandall also analyzed the potential for distributed generation resources that could be developed in the target areas, with a particular focus on Combined Heat and Power (CHP) systems. Mr. Crandall testified to his findings, as follows:

**Q. How much CHP resource is available in the target area comprised of Maryland, Virginia and the District of Columbia?**

A. According to the United States Department of Energy 2016 Technical potential study there is 7,861 MW's of CHP technical potential in the District of Columbia, Maryland and Virginia. Technical potential is defined as the estimation of market size constrained only by technological limits without regard to economic or market factors.

**Q. How much of this technical potential CHP resource is likely to be developed?**

A. That is difficult to forecast, since each CHP unit is in essence customized to the specific heat and electrical needs of the company installing it. However, to provide some context, I've assumed that 5% of the technical potential is developed, or about 400 MW in the District of Columbia, Maryland and Virginia.

**Q. Did you estimate how much of the CHP resource would be developed in Dominion, PEPCo and BGE?**

A. Yes. CHP would be developed primarily in the commercial and industrial sectors. For purposes of this assessment, I assumed that 400 MW would be allocated by the amount of commercial/industrial sales in Dominion, PEPCo and BGE in proportion to the combined commercial/industrial sales in the District of Columbia, Maryland and Virginia. On that basis, about 131 MW of CHP would be developed in Dominion, 47 MW in BG&E and 24 MW in PEPCo and would reduce demand.

CHP units will have high utilization rates (a high percentage of capacity that a device is expected to be used productively). I've assumed capacity factors (ratio of actual output compared to a period of time a unit is a providing full nameplate output) averaging 70%. On that basis, about 802 GWH of CHP would be developed in Dominion, 286 GWH in BGE and 144 GWH in PEPCo.

OCA St. 3 at 26-27.

Following this review of the changing energy landscape in Virginia, Maryland and D.C., Mr. Crandall testified to the following conclusions:

**Q. Would inclusion of the non-wire alternatives mentioned earlier in this testimony impact the benefit cost ratio for The IEC Project?**

A. Yes. Maryland, Virginia and D.C. have a significant magnitude of energy efficiency, renewable energy and distributed generation potential. Even with the conservative assumptions I have built into my assessment, the amount of energy

efficiency, renewable energy and CHP that will be developed over the next 15 years in the target zone will be the equivalent of a moderately sized utility. As shown in Table 2, the load reduction on the target utilities due to these resources could be on the order of 36% of the size of PEPCo and 47% of the size of West Penn Power. These are substantial impacts. Some are already underway through formal initiatives, while others are likely to develop due to economics and resource use.

Table 2 Revised

| NON-TRANSMISSION ALTERNATIVE RESOURCES | | | | |
|---|---|---|---|---|
| **ENERGY GWH** | | | | |
| | Energy Efficiency | Renewable Energy | CHP | Total |
| Dominion | 545 | 6,523 | 802 | 7,870 |
| PEPCo | 479 | 72 | 144 | 695 |
| BGE | 600 | 0 | 286 | 886 |
| TOTAL | 1,624 | 6,595 | 1,232 | 9,451 |
| | | | PEPCO 2016 Sales | 26,114 |
| | | | TOTAL as % of PEPCO | 36% |
| | | | West Penn Power 2016 Sales | 19,966 |
| | | | TOTAL as % of West Penn | 47% |
| **CAPACITY MW** | | | | |
| | Energy Efficiency | Renewable Energy | CHP | Total |
| Dominion | 206 | 3,723 | 131 | 4,060 |
| PEPCo | 181 | 41 | 24 | 246 |
| BGE | 227 | 0 | 47 | 273 |
| TOTAL | 614 | 3,764 | 201 | 4,579 |
| | | | PEPCO 2016 Peak | 5,786 |
| | | | TOTAL as % of PEPCO | 79% |
| | | | West Penn Power 2016 Peak | 3,947 |
| | | | TOTAL as % of West Penn | 116% |

PJM did not give due consideration to these alternatives in their benefit/cost analysis. The impact of including the alternatives mentioned above would impact the economic viability of The IEC Project.

OCA St. 3 at 28-29 (as revised).

*d. Company Rebuttal and the OCA's Response*

The main company witness responding to Mr. Crandall in the areas of energy efficiency and potential non-wires solutions was Steven Herling. Transource St. 7-R. Mr. Herling testified that PJM does include energy efficiency, demand response, renewable resources and distributed energy resources in its modelling. As Mr. Herling explained, these resources are only modelled to the extent they are currently online as PJM does not speculate as to what may or may not be available in the future. Transource St. 7-R at 30-31.[50] According to Mr. Herling, PJM also studies distributed generation, only as to installed solar capacity. Transource St. 7-R at 32. Mr. Herling went on to testify that non-wires alternatives that have not already been built or other policies or initiatives "not supported by law or committed through agreements" are again simply too speculative to incorporate into PJM's modelling, and thus will not eliminate the need for the Project. Transource St. 7-R at 32-33.

In his Surrebuttal Testimony, Mr. Crandall responded to Mr. Herling on these issues. As Mr. Crandall testified:

> It is ironic that PJM witnesses repeatedly argue that PJM cannot rely on speculative resources, that it can only rely on those that are committed, that State policies and mandates cannot be relied upon for its planning, and uses those types of arguments to urge the Commission to dismiss my point that PJM has not considered viable non-transmission alternatives that I have identified.
>
> … PJM must speculate how Dominion is going to address the capacity shortfall up through 2033. I say, "must speculate" because if Dominion identifies it as a capacity shortfall in its plan, by definition that means Dominion has not determined how it will close the capacity shortfall, and that means PJM had to speculate about how Dominion would meet its load requirements out through 2033. PJM's speculation about what Dominion might do could increase the apparent congestion, or decrease it.

[50] Mr. Herling also testified to Demand Response measures that are incorporated into PJM's models. Transource St. 7-R at 31. As Mr. Crandall testified, however, demand response measures are "peaky" and not a good fit for the fluctuating levels of congestion in this matter that do not occur at any set times, such as during peak periods. OCA St. 3 at 27. As such, the OCA will not devote time here to further discuss demand response measures.

OCA Statement No. 3SR at 6-7.

As Mr. Crandall testified, Company testimony on the issue of what is and is not considered by PJM in their modelling as to the need for this Project is contradictory. What we do know from Mr. Herling's testimony, however, is that policies that are supported by law should be included. Transource St. 7-R at 32-33. And yet, there is no indication in the record that PJM has updated its modelling to include the Virginia Grid Transformation and Security Act of 2018, the 2017 Maryland law, or the Clean Energy D.C. Omnibus Act of 2018.

As Mr. Crandall testified, enhanced energy efficiency and conservation measures can have a substantial effect on the demand for electricity. When demand decreases the corresponding levels of congestion will also decrease. PJM's analysis fails to adequately recognize not only the continuing low levels of congestion but also the sea change in energy policy in the target areas. See e.g., OCA St. 3 at 10-12; see also, OCA Hearing Exhibit No. 6 at 599-600.

*e. Conclusion*

As Mr. Crandall's testimony shows, aggressive policies and plans are being implemented in Virginia, Maryland and D.C. that will substantially change the overall energy usage in those areas and the sources for that energy. There already are reasonable alternatives being developed in the target areas along with the already substantial decline in congestion. The OCA respectfully submits that the Commission must give proper weight to these alternatives in making a determination that would impact the Pennsylvania environment as well as Pennsylvania ratepayers.

F. ECONOMIC IMPACTS

As support for the construction of the IEC Project, the Company solicited the Brattle Group to perform an economic impact analysis of the IEC Project in Franklin and York County. Transource St. 10-R at 2. As stated by the Company's Witness, Judy Chang:

> Across Pennsylvania and Maryland, I estimate that during the construction phase of the Project, Transource's investment will support the equivalent of between 85 to 112 full-time equivalent years ("FTE-years") of employment, stimulate between $30.7 million and $36.8 million of economic activities, and generate between $690,000 and $900,000 of tax revenues for state and local governments. In Pennsylvania, I estimate that the Project would support between the equivalent of 74 and 93 FTE-years and stimulate between $25.6 and $29.6 million of economic activities. In addition, the construction of the IEC Project will create between $530,000 and $660,000 in tax revenue for state and local governments within Pennsylvania

Transource St. 10-R at 13. This economic analysis was performed in 2018 and uses an IMPLAN modeling software estimating investment dollars that will be spent on materials, equipment, and labor in the local economies. Id. Likewise, the impacts that are measured are the (1) number of jobs supported in each country or state, (2) the economic activities associated with the Project, and (3) the likely state and local tax revenues collected due to the Project during construction. In total, Company witness Chang estimated the following impacts to Franklin and York Counties:

> Table 5 shows that the IEC project is expected to support 25 to 35 full-time jobs in Franklin County and between 15 and 21 full-time jobs in York County during construction. The project is expected to stimulate $12.6 million to $14.7 million in economic activity within Franklin County, and an additional $7.1 million to $8.3 million of economic activity within York County while under construction. The jobs supported and the economic activity stimulated in Franklin and York Counties represent about half of all the job-supported and two-thirds of local economic activity stimulated by the IEC project.

Transource St. 10-R at 26.

The OCA will respond briefly to the claims of the Company as the Commission should provide little weight to this economic analysis. First, the OCA notes that Witness Chang's analysis was performed in the latter half of 2018, when the original configuration of the IEC Project was

still being considered by the Commission. Transource St. 10-R. Accordingly, the economic impact analysis has not been updated to reflect the alternative configuration of the East Portion of the IEC Project. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-2. Indeed, because the alternative configuration removed the entirety of the proposed Furnace Run-Conastone 230 kV transmission line and has been rerouted to two existing lines owned by PPL, the economic impact analysis for York County is outdated. Accordingly, the Commission should provide little weight to the York County economic impact analysis.

Furthermore, the estimated economic impact to Franklin County is far outweighed by the detrimental effects the IEC Project would cause to Pennsylvania and Franklin County, in particular. Construction of the IEC Project would increase wholesale power prices to Pennsylvania ratepayers by approximately $400 million for the first fifteen years of the Project's service life. Moreover, extensive construction activities would occur in Franklin County resulting in approximately 24.4 miles of transmission line construction and construction of a brand new substation. IEC-West Application at 10-11. More specifically, the West Portion of the IEC Project would span approximately 13.6 miles of unencumbered land, 228 acres of prime and unique farmland soil, 12.3 acres of land with Agricultural Conservation Easements, and the properties of 98 Pennsylvanians. IEC-West Application, Att. 3 at 51, 84, 86, 95. Accordingly, what economic impact may accrue to Franklin County must be viewed in light of the increased energy prices and environmental impacts resulting from the IEC Project.

G. EMINENT DOMAIN

The OCA is not addressing this issue. The OCA's lack of discussion should not be interpreted as acceptance of the Company's position.

H. ZONING EXPEMPTIONS

The OCA is not addressing this issue. The OCA's lack of discussion should not be interpreted as acceptance of the Company's position.

## VII. OTHER RELEVANT ISSUES

Transource asserts that if this Project is not approved by the Commission, potential future reliability violations may occur in 2023. The evidence demonstrates that this Project was only ever designed to address congestion on the AP South Reactive Interface. See Transource St. 3 at 24, Transource St. 8-R, Exh. TH-5R at 2. It was not, and never has been, proposed to address reliability concerns. Indeed, the Company admits that this Project is still a market efficiency project designed to address congestion on the AP South Reactive Interface, not a reliability project. See OCA St. 2-SSR at 16-17, see also Tr. at 2926. Additionally, PJM's analysis showing these reliability concerns relies upon a single generation deliverability test performed in 2018. OCA St. 2-SSR at 16-17. PJM did not perform its full suite of reliability tests to confirm that these reliability violations will result in 2023. Id. Moreover, PJM has not performed another generation deliverability test since 2018. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-10. This raises significant questions considering that numerous improvements are being made to the electric grid involving facilities that were identified as potentially overloading in 2023 in the absence of the IEC Project. See Transource St. AA-2, Exh. SRH-AA2 at 14-17. It is also clear that PPL did not identify any need to rebuild its existing single-circuit lines to address problems on its system. OCA Hearing Exh. 4, PPL Response to OCA-XLV-2. Accordingly, if the IEC Project is denied and assuming these potential future reliability violations still exist, the appropriate remedy to these concerns is through PJM's normal RTEP process.

In November 2018, Company witness Steven Herling indicated that during PJM's RTEP process for study year 2023, PJM ran a generation deliverability test without the IEC Project to

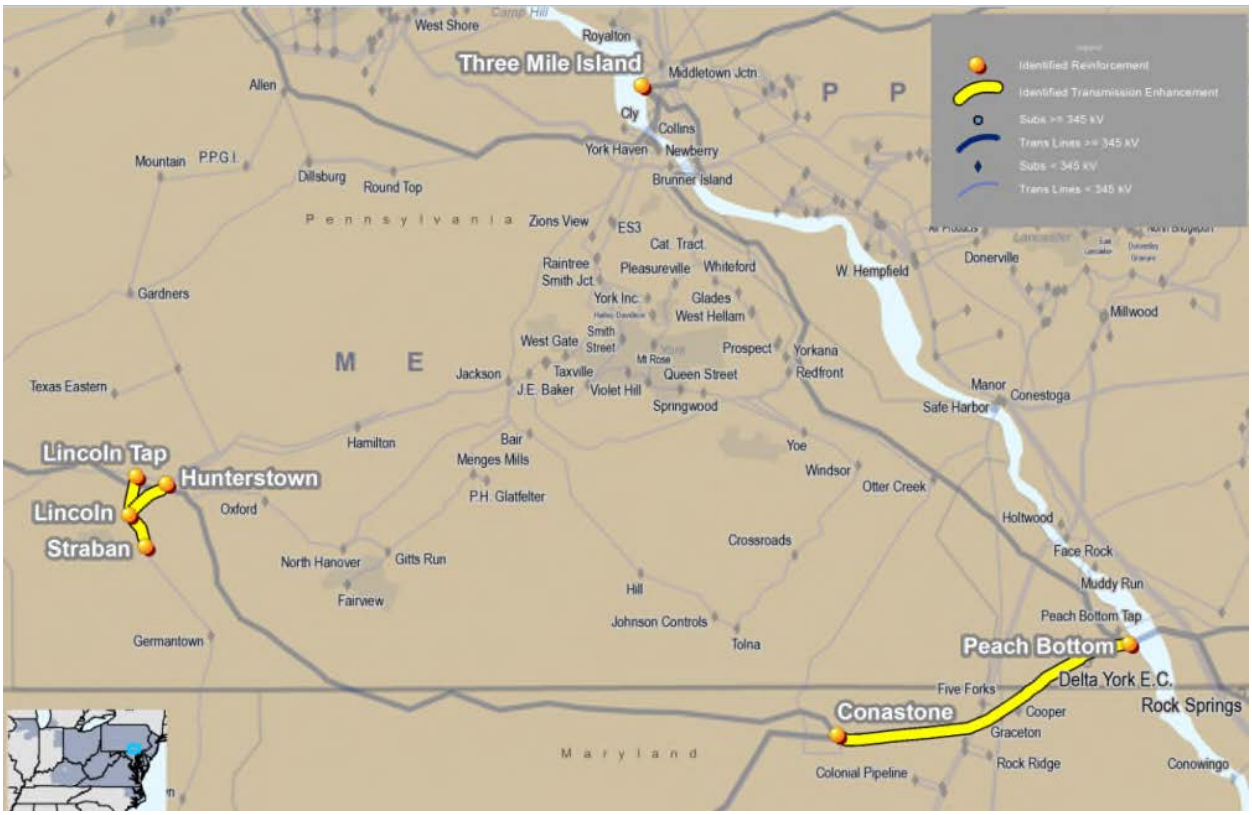
determine if the existing transmission system without the Project could deliver energy from one aggregate of generation in one area to the aggregate of load in another. Transource St. 7-R at 22.[51] Company witness Herling stated that PJM identified the following potential reliability violations that may occur in 2023:

**Table No. 1:** n-1 Single Contingency Reliability Criteria Violations without Project 9A

| **Facility Name** | **Limiting Equipment** | **Loading** |
|---|---|---|
| Three Mile Island 500/230 kV Transformer | Transformer | **117%** |
| Peach Bottom-Conastone 500 kV Line | Conductor | **109%** |
| Hunterstown-Lincoln 115 kV Line | Conductor | **123%** |
| Lincoln Tap-Lincoln 115 kV Line | Conductor | **120%** |
| Lincoln-Straban 115 kV Line | Conductor | **104%** |

Transource St. 7-R at 21 (emphasis in original). Below is a visual example of the affected facilities at issue:

[51] A generation deliverability test ensures clusters of capacity resources within PJM have sufficient transmission capability to be delivered to the aggregate of PJM load during circumstances where the capacity of that cluster of resources is needed due to higher than normal unavailability of resources elsewhere in PJM. Transource St. 7-R at 22.




**Map No. 1:** n-1 Single Contingency Reliability Criteria Violations – September 2018 Analysis without Project 9A (2023 Study Year)

Transource St. 7-R at 22. It should be noted that an N-1 Single Contingency Reliability Criteria Violation assesses voltage and thermal limits of facilities with one facility removed from service. It should also be noted that the violation with respect to Peach Bottom – Conastone Line was later corrected to an N-0 violation. Transource St. 7-RJ-Supp at 2. Accordingly, the Company asserts that failure to build the IEC Project may result in potential reliability violations in future years and, if a suitable replacement is not found in time, potential corrective measures such as load shedding may have to occur.[52] Transource St. 7-R at 24-26.

The OCA submits that the Commission dismiss the Company's argument as this Project was not designed, nor is it being proposed as a reliability project. See Transource St. 8-R, Exh.

[52] According to PPL, it did not identify any reliability violations related to its Manor-Graceton and Conastone-Otter Creek 230 kV Transmission Lines. See OCA Hearing Exh. 4, PPL Response to OCA-XLV-2.

TH-5R at 2, Transource St. 3 at 26, 31. It was not until November 2018, several months after the OCA's direct testimony in this proceeding, that PJM identified ***possible*** reliability violations occurring in the future if the Commission rejects the IEC Project for approval. Transource St. 7-R at 21. Yet, the Company has not classified this Project as anything other than a Market Efficiency Project. See Tr. at 2926; see also Transource St. 7-RJ-SUPP at 3. Furthermore, to be clear, there are no current reliability violations associated with the congestion on the AP South Interface. None of our neighbors to the south in Maryland, the District of Columbia or Virginia will see any interruption in their electric service due to this congestion, and certainly no Pennsylvania customers will experience any degradation of the electric service they currently receive. Rather, this Project is deemed a "Market Efficiency Project", as it is being put forth purely for economic reasons. Accordingly, the Commission should evaluate this Project on the basis of whether it is needed to alleviate economic congestion on the AP South Reactive Interface, as that is the purpose of this Project and what it was specifically designed to do.

Setting this aside for the moment, it is clear that PJM's warnings of potential reliability violations in the future is based on narrow, outdated studies and does not consider other remedies to the potential issues identified. When typically evaluating potential reliability violations and potential solutions, PJM performs an extensive review process subject to numerous testing requirements. See e.g. OCA St. 2-SSR, PJL Exh. SSR-1. As stated by OCA witness Lanzalotta, however, PJM's analysis of the potential future reliability violations at issue here are preliminary and rely upon a small subset of PJM's normal review process:

**Q. Do you have additional concerns as to the current testing that PJM has done in this case as it relates to the potential reliability violations that have been identified?**

A. Yes I do. As the Company and PJM have repeatedly stated, this Project is not being put forth as a reliability project. As such, the more detailed and varied testing methods that would normally be used by PJM in a pure

> reliability matter are not being done as part of the current market efficiency case. PJM characterizes its study of the potential reliability violations that might occur in the absence of Project 9A as "Preliminary". PJM only performed analysis on a 2023 RTEP power flow case. As explained by PJM in response to discovery:
>
> > The word "Preliminary" in the table on Slide No. 4 indicates that the table only lists single contingency (N-1) thermal criteria violations identified by PJM in an RTEP 2023 study year case generator deliverability analysis without Project 9A modeled. That analysis comprises only a subset of tests that PJM conducts to ensure compliance with reliability criteria, tests that would also include N-1-1 analysis for example. Because Project 9A is a project approved by the PJM board - included in PJM's RTEP in 2016 – a full analysis of NERC and Transmission Owner criteria absent Project 9A is not required at this point. (OCA XXV-05 (d)).

OCA St. 2-SSR at 16-17 (footnotes omitted). As noted above, PJM typically performs a full suite of reliability tests to fully vet reliability criteria violations and proposed solutions. As stated by Company witness Herling, PJM's basis for not performing the full reliability analysis is because the IEC Project is a market efficiency project and such additional tests were not needed. Transource St. 7-RJ-SUPP at 3. As noted by OCA witness Lanzalotta, this type of analysis is problematic because the extent and scope of these potential future reliability violations is unknown without the full suite of reliability testing. OCA St. 2SSR at 18.

Moreover, there is ample evidence to suggest that these potential reliability violations may no longer exist, or can be resolved in short order with relatively small, efficient changes. For one, many of the identified facilities are older and are being replaced or likely to be replaced in the next few years. As explained by OCA witness Lanzalotta, regarding the potential future reliability violation on the Three Mile Island 500/230 kV Transformer owned and operated by Mid-Atlantic Interstate Transmission, LLC (MAIT):

> MAIT's discovery responses indicate that the TMI transformer in question is actually three separate single-phase transformers, ranging in age from 45 years old to 48 years old. While the remaining life of these transformers depends to some

> extent on the loading history of these transformers, other 500 kV transformers approaching 50 years of age have been recommended for replacement based on age by PJM members, as reflected in Exhibit___(PJL-SSR-2). If the TMI transformers are similarly approaching the end of their useful life due to age, they will need to be replaced in the near future regardless of Project 9A. If they are replaced with larger transformers, they may no longer overload under the specified contingency conditions.

OCA St. 2-SSR at 9. This was separately confirmed by MAIT stating that the simple solution to correcting this issue would be to upgrade the transformer. OCA Hearing Exh. 5, MAIT Response to OCA-XXXVII-1.

Similarly with the potential violation regarding Peach Bottom-Conastone 500 kV line owned and operated by PECO Energy Company (PECO), PECO indicates that this 500 kV line was installed in 1967 and is 52 years old. OCA St. 2-SSR at 10. It is not uncommon, however, for rebuilds of such transmission lines to have significant improvements to operations capability. As stated by OCA witness Lanzalotta:

> By way of comparison, Virginia Electric and Power Company ("VEPCO") applied to the Virginia State Corporation Commission (SCC") in 2011 for approval of its plans to rebuild the 500 kV transmission line from Mt. Storm substation to Doubs substation…VEPCO states that the existing transmission line towers were constructed in 1966 and were in need, in 2011, of replacement due to deterioration. The VEPCO application states that rebuilding the existing 500 kV line from Mt. Storm to Doubs with modern facilities would increase the capacity of the line by about 66%. Given the virtually identical age of the Peach Bottom – Conastone 500 kV line to that of the Mt. Storm – Doubs 500 kV line before its rebuild starting around 2011, there exists a reasonable likelihood that the Peach Bottom – Conastone 500 kV line will require a rebuild in the near future, regardless of Project 9A, and that such rebuild will very likely result in a substantial capacity increase from the line's current capabilities.

OCA St. 2-SSR at 10. These are reasonable, more targeted alternatives.

Lastly, the evidence demonstrates that since the approval of the IEC Project, two more transmission projects have been approved by PJM directly involving facilities that were presented as overloaded in PJM's generation deliverability test in 2018. The first project is a rebuild of MAIT's Hunterstown-Lincoln 115-kV line. OCA Hearing Exh. 5, MAIT Response to OCA-

XLVI-6, see also Transource St. AA-2, Exh. SRH-AA2 at 15. This project consists of rebuilding approximately 2.4 miles of the Hunterstown-Lincoln 115 kV line with a larger conductor and upgrading the equipment at the Hunterstown Substation and the Lincoln Substation. Transource St. AA-2, Exh. SRH-AA2 at 15, 17. This project was approved by PJM to alleviate congestion present on the Hunterstown-Lincoln 115 kV Transmission Line. As of December 2019, the Hunterstown-Lincoln rebuild had a benefit-cost ratio of 76.41. Id., at 16.

Similarly, PJM approved Project 5E as a market efficiency project in April 2018 to reduce congestion on the Conastone-Graceton-Bagley 230 kV Transmission Line. Transource St. AA-2, Exh. SRH-AA2 at 13. Project 5E consists of re-conductoring the Conastone-Graceton and Raphael Road-Northeast 230 kV lines together with adding bundled conductors to the Graceton-Bagley-Raphael Road double circuit lines. Transource St. AA-2, Exh. SRH-AA2 at 13-14. The benefit-cost ratio of Project 5E has fallen since its approval much in the same way the IEC Project's benefit-cost ratio has diminished over time. See id. (the benefit-cost ratio was 9.18 in September 2018 and was subsequently 1.11 in November 2019).[53]

When compared to the facilities that the Company argues may potentially overload in the absence of the IEC Project, the Hunterstown-Lincoln 115-kV Transmission Line re-build and Project 5E significantly overlap those facilities. See Transource St. 7-R at 22. Yet, PJM has not performed a generation deliverability test to determine if these lines would still be overloaded if the Hunterstown-Lincoln Rebuild and Project 5E are constructed without the IEC Project in service.[54] See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-10.

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[53] PJM has continued to support construction of Project 5E, even though its benefit-cost ratio is below PJM's 1.25 benefit-cost ratio threshold. PJM asserts that when taken together with the IEC Project and the Hunterstown-Lincoln re-build, the three projects collectively continue to provide benefits in excess of a 1.25 benefit-cost ratio. See Transource St. AA-2, Exh. SRH-AA2 at 14.

[54] The OCA also questions the extent to which the Hunterstown-Lincoln rebuild and Project 5E can provide sufficient market efficiency benefits without construction of the IEC Project. With what little congestion remains on

Moreover, it is common for previously identified potential future reliability violations to cease when the electric grid undergoes changes or through smaller, more targeted upgrades. OCA Witness Lanzalotta provides an example of previously identified reliability violations resolving before a proposed project was even in place:

> **Q. In your experience, do you have any examples of where PJM planned and approved projects that did not actually reach completion?**
>
> A. Yes I do. Two of the most notable examples would be the Potomac Appalachian Transmission Highline Project (PATH) and the Mid-Atlantic Power Pathway Project (MAPP). PATH and MAPP were both approved by the PJM Board in 2007. PATH included a 765 kV transmission line running from Amos substation in West Virginia to the Kemptown substation in Maryland, along with related substation facilities. MAPP included a 500 kV transmission line running from Possum Point substation in Virginia to Salem substation in New Jersey, along with related substation facilities and a High Voltage Direct Current (HVDC) Chesapeake Bay crossing by submarine cable construction. By August 2012, electric system conditions had changed sufficiently to cause the PJM Board to remove both these projects from the PJM RTEP. Neither of these projects has reappeared in RTEP planning since then.

OCA St. 2-SSR. Additionally, the TrAILCo proceeding is another example of proposed facilities that were much larger in comparison to the small upgrade that was done, while still accomplishing the same objectives. In that proceeding, the "Prexy Segment" was proposed to resolve several reliability violations and consisted of a new Prexy Substation, a new 500 kV line from the proposed Prexy substation to the 502 Pennsylvania Junction, and three associated double circuit lines. TrAILCo, 2008 Pa. PUC LEXIS 60 at *200. In response, the OCA's witness, Peter Lanzalotta, concluded that it was "possible to eliminate all of the potential problems identified by…adding four new 138 kV lines on existing use rights-of-way and two 138 kV substation capacitors to the

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the AP South Reactive Interface, these Projects may be sufficient to alleviate any remaining congestion on the constrained facility. PJM, however, has not performed a market efficiency analysis to determine what incremental benefit the IEC Project provides over the Hunterstown-Lincoln rebuild and Project 5E. See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-12.

existing system in Washington County," without needing the proposed Prexy Segment. Id., at *212. Ultimately, a settlement was reached wherein the Parties agreed to construct a much more targeted, efficient alternative in lieu of the Prexy Segment, as summarized by the Commission:

> The OCA concisely presented its position that the proposed Joint Petition for Settlement is in the public interest and went on to discuss in detail the collaborative process utilized. The OCA finds the terms and conditions of the Settlement to be in the public interest because the Settlement:
>
> - Eliminates the need to build the proposed Prexy Facilities, including 37 miles of 500 kV transmission lines through Greene and Washington Counties, the 500 kV Prexy Substation and 15 miles of new 138 kV transmission lines;
>
> - Proposes an infrastructure upgrade that is projected to resolve the identified reliability concerns in Washington County for at least the next 10 years;
>
> - Proposes an infrastructure upgrade that is estimated to cost $ 11.6 million, as compared to the approximate $ 213 million estimate needed to build the Prexy Facilities;
>
> - Proposes an infrastructure upgrade that primarily involves installing one new steel monopole on an existing utility right-of-way; and
>
> - Proposes an infrastructure upgrade that maximizes the use of existing utility infrastructure, and in turn imposes virtually no impact on property owners near the solution site.

In Re: Application of Trans-Allegheny Interstate Line Company (TrAILCo) For approval: 1) for a certificate of public convenience to offer, render, furnish or supply transmission service in the Commonwealth of Pennsylvania; 2) authorization and to locate, construct, operate and maintain certain high-voltage electric substation facilities; 3) authority to exercise the power of eminent domain for the construction and installation of aerial electric transmission facilities along the proposed transmission line routes in Pennsylvania; 4) approval of an exemption from municipal zoning regulation with respect to the construction of buildings; and 5) approval of certain related affiliated interest arrangements, Docket No. A-110172, *et al.*, 2010 Pa. PUC LEXIS 1285 at *45-46 (Pa. PUC Oct. 8, 2010).

For the reasons stated above, the Company has not demonstrated that these potential future reliability violations will exist in the absence of the IEC Project, nor have they shown that smaller, more targeted alternatives are inadequate in its place. The OCA submits that the Commission should reject consideration of this argument as the IEC Project has been put forth as a market efficiency project specifically designed to address congestion on the AP South Reactive Interface, not to solve reliability issues. Moreover, the Company's evidence that future reliability violations will occur in the absence of the IEC Project is based upon narrow, outdated studies that do not take into consideration recent projects that have been approved by PJM for construction. Further, PJM has failed to perform additional tests in light of the Hunterstown-Lincoln 115 kV rebuild and Project 5E, which represent a significant upgrade of facilities that were projected to overload in 2023. It is likely that these projects, along with smaller, targeted upgrades can satisfy any concerns noted by PJM in the absence of the IEC Project. Accordingly, the IEC Project should not be approved on this basis.

## VIII. CONCLUSION

Transource has failed to demonstrate that the proposed IEC Project is necessary and proper for the accommodation, convenience and safety of the public. This is a market efficiency project designed to alleviate congestion on the AP South Reactive Interface, an economic constraint where very little congestion currently exists. Under the Company's best estimates, the thirteen states that comprise PJM will experience a net reduction in wholesale power prices of only approximately $32.5 million over a period of 15 years at the cost of $527 million over that same period of time. In Pennsylvania alone, ratepayers are estimated to experience a net increase of approximately $400 million in wholesale power prices. To achieve these inadequate results, the Company is asking that Pennsylvania and its landowners burden their lands with new transmission infrastructure for the foreseeable future, infringing upon the inviolate environmental rights of Pennsylvanians.

For all of the reasons above, the Office of Consumer Advocate respectfully requests that the Commission deny the Company's Applications to construct the IEC Project.

Respectfully Submitted,

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Dated: August 11, 2020
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**APPENDIX A**

PROCEDURAL HISTORY

On December 27, 2017, Transource Pennsylvania, LLC (Transource or Company), a subsidiary of Transource Energy, LLC (Transource Energy), filed two Applications with the Pennsylvania Public Utility Commission (Commission) seeking approval of the siting and construction of the Pennsylvania portion of two 230 kV transmission lines and two substations associated with the Independence Energy Connection Project (IEC Project) in portions of York and Franklin Counties. The applications are captioned as follows:

- Application of Transource Pennsylvania, LLC Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – East Project in Portions of York County, Pennsylvania, A-2017-2640195
- Application of Transource Pennsylvania, LLC Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – West Project in Portions of Franklin County, Pennsylvania, A-2017-2640200

By Initial Notice of Prehearing Conference dated January 4, 2018, the Commission assigned Administrative Law Judges Elizabeth Barnes and Andrew Calvelli to serve as Presiding Officers over the applications. The Initial Notice was published in the Pennsylvania Bulletin and the deadline for protests and petitions to intervene was February 20, 2018. The ALJs convened an initial Prehearing Conference on March 13, 2018, following which they issued a Procedural Order on March 28, 2018 and an Order Amending the Procedural Order on April 2, 2018, setting forth a procedural schedule in this matter and modifying the Commission's discovery regulations.

The Office of Consumer Advocate filed a Protest and Public Statement on January 10, 2018 in each docket, as did the Office of Small Business Advocate on March 5, 2018. PECO Energy, West Penn Power, Mid-Atlantic Transmission, LLC (MAIT), and PPL Electric Utilities Corporation (PPL) later filed Petitions to Intervene in the matter. Eight landowners or other

interested citizens submitted Petitions to Intervene and approximately seventy-four citizens, small businesses and non-profit entities filed Protests. The York County Planning Commission (YCPC), Citizens to Stop Transource – York County (Citizens) and Stop Transource Franklin County (STFC) submitted Protests as well. Hundreds of non-party individuals and entities submitted comments to the Commission in advance of the March 13, 2018, Prehearing Conference.

At the Prehearing Conference, the ALJs granted all of the Petitions to Intervene and Transource PA's Petition for a Protective Order and established a procedural schedule.

In light of the demonstrated public interest in the proceeding, eight public input hearings were convened, four in York County on May 9 and 14 and four in Franklin County on May 22 and 23. In all, approximately 250 witnesses testified at those public input hearings. Subsequently, on May 29 and 30, on-site hearings were held in Franklin County and on June 1, hearings were convened in York County for the purpose of receiving sworn testimony by all of those affected landowners who requested a site visit. During those three days of on-site hearings, approximately 33 witnesses offered sworn testimony relevant to the impacts on the use and enjoyment of their land, the loss of agricultural productivity, negative impacts on businesses and communities, impacts on the viewsheds, the well water quality, detrimental effects upon protected waterways and historic sites, among other adverse effects.

On May 15, 2018, Transource submitted 133 Eminent Domain Applications against all but three of the affected landowners named in the Company's Application, Attachment 5. Transource also filed two petitions seeking Commission approval of buildings to shelter control equipment at the proposed Rice and Furnace Run Substations and assigned Docket Nos. P-2018-3001878 and P-2018-2001883, respectively. On June 1, 2018, the OCA filed Notices of

Intervention in those dockets as well as a Motion to Amend the Procedural Schedule. Through that Motion, the OCA sought at least a sixty-day extension of the deadline for the service of written intervenor direct testimony Transource filed and served an Answer to that Motion.

The ALJs scheduled an informal conference on June 15 to discuss the OCA's Motion and the ongoing discovery delays. During that conference, STFC, Citizens and the YCPC all expressed support for the OCA's Motion.

On June 6, 2018, the ALJs issued a Second Prehearing Conference Order in accordance with 66 Pa. C.S. Section 333, scheduling the conference for July 9, 2018 at 10:00 am. This Order was published in the Pennsylvania Bulletin on June 16, 2018. 48 Pa. B. 3679. On June 26, the ALJs issued the Third Prehearing Order, which granted the OCA's Motion for an extension of the time allowed for intervenor direct testimony from July 25 to September 25, 2018.

Through the ALJs' Prehearing Order of June 26, 2018, all of the 133 eminent domain applications, as well as the petitions for approval at Docket Nos. P-2018-2001878 and P-2018-2001883, were consolidated with the applications. The July 30, 2018 Fourth Prehearing Order admitted photos taken by Commission Staff at the Franklin and York County site visits into the record. Additional Petitions to Intervene in the consolidated proceedings (including the eminent domain petitions and those for approval of buildings) were granted and Protests in same acknowledged. Discovery was ongoing through this period, with the OCA serving written discovery in the form of interrogatories up to and including Set XXIV on August 9, 2018.

As stated above, the ALJs granted OCA's Motion to Amend the Procedural Schedule and scheduled further public input hearings for September 18 in Chambersburg (Franklin County) and September 20 in Airville (York County), in the interest of allowing affected landowners more due process. Pursuant to the amended procedural schedule, the OCA served the written

Direct Testimonies of Scott J. Rubin, Peter J. Lanzalotta and Geoffrey Crandall, OCA Statements 1 through 3, respectively, on September 25, 2018.

Discovery by Transource PA in the form of three sets of written interrogatories ensued, to which the OCA served timely responses. Transource PA served its written rebuttal testimonies on November 27, 2018 as follows: St. 1-R, Brian D. Weber (Need and Siting); St. 2-R, Kamran Ali (Reliability); St. 4-R, Barry Baker (Siting and Routes); St. 5-R, Kent Herzog (Structural Design); St. 6-R, Thomas Shaffer (Rights of Way); St. 7-R, Steven Herling (Market Efficiency; Need); St. 8-R, Timothy Horger (Market Efficiency; Project Selection); St. 9-R, James Cawley (PJM/Regional Planning); St. 10-R, Judy Chang (Economic Effects); St. 11-R, Stephen Stein (Costs/Schedule); 12-R, Keith Yamatani (Construction/Karst); St. 13-R, William Rothman (Effect on Property Values); St. 14-R, David Dominy (Real Estate Valuation); St. 15-R, J. Michael Silva (EMF); St. 16-R, Nancy Lee (Epidemiology/EMF); St. 17-R, Dwight Mercer, (EMF Effect/Animals).

Upon reviewing the rebuttal testimony, the OCA discovered that the Company had added twelve (12) new witnesses to address the arguments of opposing Parties and to further justify the need for this project. More important, the Company claimed that the IEC Project would also address several potential future reliability violations, in contrast to its initial case, which sought approval solely based upon the perceived need to increase market efficiency within PJM.

As support for this claim, the Company had submitted an entirely new analysis, *i.e.* a generation deliverability test, which also incorporated many new assumptions. That information had not been included in the Company's case-in-chief, and introduction of new evidence at the rebuttal stage of the proceeding is generally inconsistent with Section 5.243(e) of the Commission's Regulations. 52 Pa. Code § 5.243(e).

For those reasons, on December 7, the OCA submitted a Motion to Amend the Procedural Schedule to allow additional time to conduct discovery, analyze the new generation deliverability analysis performed by PJM Interconnection, LLC (PJM), and prepare to file surrebuttal testimony. On December 10, Citizens filed a motion seeking the same relief. On December 13, STFC followed with a Motion to Amend the Procedural Schedule and to Strike Certain Testimony, *i.e.*, the portions of the testimony raising the new issue of reliability concerns. Transource PA submitted timely answers to all three motions.

Through the Sixth Prehearing Order of December 31, the ALJs granted Transource PA's Petitions for Leave to Withdraw Eminent Domain Applications and resolved the opposing parties' motions regarding the rebuttal testimony. The ALJs granted the OCA's Motion to Amend the Procedural Schedule in part, as well as the Motions of STFC and Citizens, by postponing the deadline for surrebuttal testimony from January 16 to January 30, while the deadline for rejoinder testimony remained the same. Sixth Prehearing Order at 7. In addition, the ALJs agreed with STFC that the portions of the Company's rebuttal testimonies that mention these new future potential reliability claims introduced direct testimony at the rebuttal phase and granted its Motion to Strike. Id. at 8. The ALJs agreed that the testimonies associated with reliability concerns or potential violations effectively altered the scope and complexity of the issues to be addressed by the opposing parties. Id. at 5.

On January 16, STFC submitted a Motion to Designate Stricken Testimony consistent with the ALJs Sixth Prehearing Order. The OCA and Citizens submitted Answers concurring with the Motion. Through the Seventh Prehearing Order of January 24, 2019, the ALJs granted STFC's Motion and thereby specified the page and line numbers of the testimony and exhibits to be stricken. Seventh Prehearing Order at 3-4. The Seventh Prehearing Order also clarified that

portions of the rebuttal testimonies of the following Transource witnesses were to be stricken to the extent they mention the new potential future reliability claims: Brian D. Weber, Kamran Ali, Stephen Herling, Timothy Horger, and Judy Chang.

Opposing parties served surrebuttal testimony on January 28, 2019. The OCA served Statement No. 1-SR by Scott Rubin, Statement No. 2-SR by Peter Lanzalotta and Statement No. 3-SR by Geoffrey Crandall on that date.

On February 1, 2019, Transource PA submitted a Petition for Interlocutory Review and Answer to a Material Question, challenging the ALJs' Prehearing Orders granting STFC's Motion to Strike the Company's rebuttal testimony. All parties submitted briefs in support of their respective positions on the Petition on February 11. Also on February 11, Transource PA served its written rejoinder testimony. The OCA followed the service of rejoinder with a Motion to Strike the Rejoinder to the extent that it failed to comply with the Sixth Prehearing Order. Transource PA filed and served its Answer. STFC and Citizens submitted Motions expressing the same position. Transource PA thereafter served redacted versions of the rejoinder statements that were consistent with the ALJs' Orders, i.e., Rejoinder Statements 1-RJ (Weber), 2-RJ (Ali), 7-RJ (Herling), 8-RJ (Horger), 9-RJ (Cawley), 10-RJ (Chang).

The parties proceeded to evidentiary hearings for the purposes of entering all pre-served direct, rebuttal and surrebuttal testimonies and exhibits into the evidentiary record on February 21-22 and 25-27, 2019 and cross-examination of witnesses. The ALJs also allowed oral testimony by several pro se parties.

By Order entered March 20, 2019, the Commission granted the Company's Petition for Interlocutory Review and answered the following questions in the affirmative:

> 1. Whether the ALJs erred by striking Transource PA's rebuttal testimony regarding the Project's reliability benefits, thereby violating 66 Pa.C.S. 332(c) and denying Transource PA due process of law?
>
> 2. Whether the ALJs' error unreasonably prevents the development of a full and complete record and denies the PUC access to the most recent available information in determining the need for this transmission line Project?

The Commission therefore remanded the matter to the Office of Administrative Law Judge for further proceedings consistent with its Opinion and Order entered March 20, 2019.

By the Tenth Prehearing Order of April 2, 2019, the ALJs directed Transource PA to serve its unredacted rebuttal and rejoinder statements within ten days. Furthermore, the ALJs modified the procedural schedule to allow for the submission of supplemental surrebuttal and rejoinder testimonies with respect to the previously redacted matter relating to reliability and scheduled evidentiary hearings for June 28-29, 2019.

The parties proceeded with additional discovery and responses on the unredacted statements. On May 29, 2019, the OCA served its OCA St. 2-SSR, the Supplemental Surrebuttal Testimony of Peter J. Lanzalotta, responding to the Company's claims of potential future reliability violations.

On June 18, 2019, Transource filed a Motion to Suspend the Procedural Schedule seeking additional time to engage in settlement discussions, requesting that the evidentiary hearings scheduled for June 28-29, 2019, be postponed and that the parties provide status updates to the Presiding Officers every 30 days. On June 21, 2019, the Eleventh Prehearing Order was issued delaying evidentiary hearings until August 7-8, 2019. By way of Hearing Notice on August 1, 2019, those evidentiary hearings were further postponed until October 2-4, 2019, to provide additional time for settlement discussions to continue.

On October 17, 2019, Joint Partial Settlements were filed with the Commission between 1) Transource and the York County Planning Commission; 2) Transource and Citizens to Stop Transource York County, Maple Lawn Farms, Barron Shaw and Shaw Orchards; and 3) Transource and PPL Electric Utilities Corporation. Under the Settlements, Transource agreed to file an amended application to propose an alternative configuration for the East Portion of the IEC Project in York County, Pennsylvania. The alternative configuration would primarily utilize existing rights-of-way and transmission infrastructure in York County.

A Prehearing Conference was held on October 28, 2019, for the Presiding Officers to obtain further details of the Settlement and to check the status of the ongoing litigation for the West Project portion of the consolidated proceeding. During the Conference, the Parties advised that, although a Settlement had been reached for the East Project, Transource PA intended to file various documents with the Commission, including, without limitation, Joint or Amended Application(s) and related filings. Further, OCA requested to move into the record the Supplemental Surrebuttal Testimony of Witness Peter J. Lanzalotta, who was to retire before the anticipated further hearing. The ALJs held that as long as Mr. Lanzalotta signed a verification attached to his testimony, a Joint Stipulation for Admission of Evidence with Mr. Lanzalotta's testimony may be filed and admitted into the record.

On November 26, 2019, OCA moved for admission into the evidentiary record the Supplemental Surrebuttal Testimony of Peter J. Lanzalotta. Pursuant to the Joint Stipulation attached to the Motion, OCA stipulated to the authenticity of OCA St. No. 2-SSR and accompanying exhibits. A verification was also attached to OCA St. No. 2-SSR. Upon due consideration of this unopposed Motion, the Joint Stipulation, and given the filed verification, the Presiding Officers granted the motion on November 27, 2019.

On January 29, 2020, pursuant to the settlement agreements reached with the other parties, Transource and PPL filed a Joint Amended Application for the Siting and Construction of the 230 kV Transmission Lines associated with the Independence Energy Connection-East Project. Under the Amended Siting Application, instead of pursuing greenfield construction of a new 230 kV transmission line in York County, Transource seeks to work cooperatively with PPL to reroute the majority of the IEC East Portion of the Project to two existing transmission lines in York County. Currently operating as single circuit lines, PPL will convert the existing Manor-Graceton 230 kV line and the Otter Creek-Conastone 230 kV line to double circuit 230 kV lines. Additionally, PPL will utilize existing right of way, currently hosting an abandoned transmission line, to construct two new 230 kV transmission lines that will connect the double circuit Manor-Graceton and Otter Creek-Conastone transmission lines to the proposed Furnace Run Substation. Under its amended plan, Transource will construct, own, and operate the Furnace Run Substation as originally proposed. Transource PA asserted that the alternative configuration of the IEC East Portion of the Project will provide the same benefits as the original IEC Project. The IEC West Portion of the Project remains the same as originally proposed by Transource.

On January 31, 2020, the Fourteenth Prehearing Order was issued advising the parties of a prehearing conference scheduled for March 18, 2020. Additionally, Transource's Amended Siting Application was noticed in the Pennsylvania Bulletin on February 8, 2020, indicating that Protests and Petitions to Intervene should be filed on or before February 28, 2020. Accordingly, on February 19, 2020, STFC filed an Answer to the Amended Application. Further, on February 28, 2020, the OCA filed its Protest in opposition to the Amended Siting Application and Franklin County filed a Petition to Intervene and Protest. On March 10, 2020, Transource and PPL filed a joint reply to STFC's Answer.

**APPENDIX A**

On March 16, 2020, the Prehearing Conference scheduled for March 18, 2020 was canceled due to the impacts from the ongoing novel coronavirus (COVID-19) pandemic. On May 6, 2020, the Prehearing Conference was rescheduled for May 20, 2020. Discovery was ongoing through this period, with the OCA serving written discovery in the form of interrogatories up to and including Set XLVIII on April 30, 2020.

On May 20, 2020, the Prehearing Conference was held as a Telephonic Conference. The Commission established that the hearings would be conducted via Business Skype and instructions for participating would be e-mailed to the parties and contained in a Notice of Further Evidentiary Hearing. The parties proceeded with additional discovery and responses. A further evidentiary hearings was held on July 9, 2020, for the purpose of admitting the remaining written testimony into the record and to conduct cross-examination regarding the Company's potential future reliability claims and the alterative configuration of the IEC Project. A Briefing Order was later issued on August 5, 2020, directing the parties to file main briefs on August 11, 2020, and Reply Briefs on September 25, 2020.

The OCA's Main Brief to which this Procedural History is appended is filed on August 11, 2020, consistent with the Briefing Order, as are those of the other active parties to this proceeding. The active parties will file and serve their reply briefs consistent with that Order on September 25, 2020.

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I. Background

1. Applicant Transource PA, LLC (Transource), is a limited liability company organized and existing under the laws of Delaware and is a wholly owned direct subsidiary of Transource Energy, LLC. IEC-West Application at ¶ 3.

2. The Office of Consumer Advocate, Intervenor, is statutorily authorized to represent the interest of public utility consumers in the Commonwealth of Pennsylvania, in all proceedings before the Public Utility Commission and the courts affecting the interest of public utility consumers. 71 P.S. § 301-7, et seq.

3. PJM Interconnection, LLC, is the Regional Transmission Organization (RTO) charged by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act, 16 U.S.C. § 791a, et seq., with maintaining the bulk electric transmission system in a 13 state region that includes most of Pennsylvania. IEC-West Application at ¶ 10.

4. PJM prepares an annual Regional Transmission Expansion Plan (RTEP) detailing a series of analyses to ensure reliable flow of electricity to its customers. IEC West Application at ¶ 11.

5. As part of its RTEP, PJM conducts a market efficiency analysis to find areas where congestion exists and seeks solutions to reduce congestion. IEC West Application, Att. 2 at 2-3.

6. On October 30, 2014, PJM opened a long-term RTEP proposal window ("2014/2015 Long-Term Window") to solicit market efficiency proposals to alleviate congestion on the AP South Reactive Interface, a set of four 500 kV transmission lines that originate in West Virginia and terminate in Maryland. IEC West Application at ¶ 17.

7. Congestion on the AP South Reactive Interface totaled approximately $800 million from 2012 to 2016. Transource St. 3 at 25.

8. Forty-one proposals were submitted as part of the 2014/2015 Long-Term Window to address congestion on the AP South Reactive Interface. IEC West Application, Att. 2 at 4.

9. Transource Energy, the parent of Transource, submitted "Project 9A," to resolve congestion on the AP South Reactive Interface. Transource St. 8-R, Exh. TH-5R at 2; Tr. 2387-88. The Independence Energy Connection Project (IEC Project or Project) is a major component of Project 9A. IEC West Application at ¶ 17.

10. After evaluation and review of the IEC Project, the PJM Board approved Project 9A on August 2, 2016, as Baseline Upgrade Numbers b2743 and b2752, which includes the IEC Project. IEC West Application at ¶ 18.

11. On November 2, 2016, PJM and Transource Energy executed a Designated Entity Agreement (DEA). IEC West Application ¶ 21. FERC approved the DEA on January 12, 2017, at Docket No. ER17-349-000. Id. Pursuant to Schedule E of the FERC-approved DEA, Transource Pennsylvania, LLC, is responsible for the construction, ownership, maintenance, and operation of the Pennsylvania Portion of the IEC Project. Id. Under the same agreement, Transource's Maryland affiliate, Transource Maryland, LLC, is responsible for the construction, ownership, maintenance, and operation of the Maryland portion of the IEC Project. Id.

12. On February 7, 2017, Transource filed an Application with the Commission requesting all necessary authority, approvals, and certificates of public convenience authorizing Transource to begin to furnish and supply electric transmission service as a Pennsylvania public utility within two corridors to be located in Franklin and York Counties, Pennsylvania. IEC West Application ¶5; see also Application of Transource Pennsylvania, LLC for All of the Necessary Authority, Approvals, and Certificates of Public Convenience (1) to Begin to Furnish and Supply Electric Transmission Service in Franklin and York Counties, Pennsylvania; (2) for Certain Affiliated Interest Agreements; and (3) for any Other Approvals Necessary to Complete the Contemplated Transactions, Docket No. A-2017-2587821. On January 23, 2018, the Commission granted the Company's request pursuant to the settlement agreement reached in that proceeding. Id., Opinion and Order (Pa. PUC Jan. 23, 2018).

II. Independence Energy Connection Project

13. On December 27, 2017, Transource filed an application with the Pennsylvania Public Utility Commission (Commission) seeking approval to site and construct the Pennsylvania portion of the Rice-Ringgold 230 kV Transmission Line in portions of Franklin County, Pennsylvania. Application of Transource Pennsylvania, LLC for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – West project in portions of Franklin County, Docket No. A-20172640200 (IEC West Application). The Rice-Ringgold 230 kV Transmission Line extends 28.8 miles to connect the existing Ringgold Substation located near Smithsburg, Washington County, Maryland to a proposed Rice Substation in Franklin County, Pennsylvania, of which, 24.4 miles will be located in Pennsylvania. IEC West Application at ¶ 6.

14. On December 27, 2017, Transource filed an application with the Pennsylvania Public Utility Commission (Commission) seeking approval to site and construct the Pennsylvania portion of the Furnace Run-Conastone 230 kV Transmission Line in portions of York County, Pennsylvania. Application of Transource

Pennsylvania, LLC for Approval of the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – East project in portions of York County, Docket No. A-20172640195 (IEC East Application). The Furnace Run-Conastone 230 kV Transmission Line extends 15.7 miles to connect the existing Conastone Substation located near Norrisville, Harford County, Maryland to the proposed Furnace Run Substation in York County, Pennsylvania, of which, 12.7 miles will be located in Pennsylvania. IEC East Application at ¶ 6.

15. On May 15, 2018, Transource filed a Petition for a Finding that a Building to Shelter Control Equipment at the Rice Substation in Franklin County, Pennsylvania is Reasonably Necessary for the Convenience or Welfare of the Public. Petition of Transource Pennsylvania, LLC for a Finding that a Building to Shelter Control Equipment at the Rice Substation in Franklin County, Pennsylvania is Reasonably Necessary for the Convenience or Welfare of the Public, Docket No. P-2018-3001878. In addition to constructing, owning and operating the Rice-Ringgold 230 kV Transmission Line, Transource seeks approval to construct, own, and operate the proposed Rice Substation. Id., Petition ¶ 7. The Rice-Ringgold 230 kV Transmission Line and the Rice Substation compose the West Portion of the IEC Project.

16. On May 15, 2018, Transource filed a Petition for a Finding that a Building to Shelter Control Equipment at the Furnace Run Substation in York County, Pennsylvania is Reasonably Necessary for the Convenience or Welfare of the Public. Petition of Transource Pennsylvania, LLC for a Finding that a Building to Shelter Control Equipment at the Furnace Run Substation in York County, Pennsylvania is Reasonably Necessary for the Convenience or Welfare of the Public, Docket No. P-2018-3001883. In addition to constructing, owning and operating the Furnace Run-Conastone 230 kV Transmission Line, Transource seeks approval to construct, own, and operate the proposed Furnace Run Substation. Id., Petition ¶ 9. The Furnace Run-Conastone 230 kV Transmission Line and the Furnace Run Substation compose the original configuration of the East Portion of the IEC Project.

17. On May 15, 2018, Transource filed 133 eminent domain applications to acquire portions of Pennsylvania land to site and construct the IEC Project. See Application of Transource Pennsylvania, LLC for Approval to Acquire a Certain Portion of the Lands of Various Landowners in York and Franklin Counties, Pennsylvania for the Siting and Construction of the 230 kV Transmission Line Associated with the Independence Energy Connection – East and West Projects as Necessary or Proper for the Service, Accommodation, Convenience, or Safety of the Public, Docket Nos. A-2018-3001881, *et al*.

18. On October 17, 2019, Transource filed several settlement agreements with the Commission, indicating an agreement had been reached between Transource, PPL Electric Utilities Corporation (PPL), York County Planning Commission (YCPC),

Citizens to Stop Transource – York County (Citizens), Maple Lawn Farms, and Barron Shaw and Shaw Orchards. See Joint Partial Settlement Between Transource Pennsylvania LLC and the York County Planning Commission, *et al.* By way of settlement, the Company agreed to propose an alternative configuration for the East Portion of the IEC Project. Id., ¶ 9.

19. On January 29, 2020, Transource filed an Amendment to its IEC East Application seeking to reroute the proposed Furnace Run-Conastone 230 kV Transmission Line to existing facilities in the Project area that are currently owned and operated by PPL Electric Utilities Corporation (PPL). Amended IEC East Application ¶ 38, 41.

20. The alternative configuration of the East Portion of the IEC Project consists of re-conductoring PPL's Manor-Graceton and Otter Creek-Conastone 230 kV Transmission Lines as double circuit lines and constructing two additional 2-mile segments to terminate the rebuilt PPL lines to the proposed Furnace Run Substation. Amended IEC East Application ¶ 42. The additional 2-mile segments will be constructed over existing right-of-way, but will need to be expanded to accommodate the larger transmission lines. Id. While PPL will continue to own and operate the transmission line segments, Transource will continue to construct, own, and operate the Furnace Run Substation. Id., ¶ 41.

## III. Need for the Independence Energy Connection Project

### A. PJM's Market Efficiency Process

21. Congestion occurs when the least costly resources that are available to serve load in a given region cannot be dispatched because transmission facility limits constrain power flow on the system. Transource St. 3 at 24.

22. As part of the Market Efficiency Process, PJM can consider (i) accelerating reliability-based enhancements or expansions already included in the Regional Transmission Plan that if accelerated also could relieve one or more economic constraints; (ii) modifying reliability-based enhancements or expansions already included in the Regional Transmission Plan that as modified would relieve one or more economic constraints; and (iii) adding new enhancements or expansions that could relieve one or more economic constraints, but for which no reliability-based need has been identified. Transource St. 7-R, Exh. No. SRH-3R at 10.

23. When congestion is identified on the bulk transmission grid and no currently approved projects can alleviate that congestion, PJM opens up a competitive selection process soliciting proposals from third parties to mitigate this congestion. Transource St. 3 at 5; Transource St. 7-R, Exh. SRH-3R at 11.

24. PJM's competitive solicitation planning process is based on a sponsorship model, meaning that PJM must consider only those project proposals as submitted through its competitive proposal windows. All project proposals submitted are reviewed by PJM and presented to the TEAC. Transource St. 7 at 27-28.

25. During its review process, PJM performs a benefit-cost analysis on each project submission to determine whether the new facilities can lower costs to customers, and that the benefits of the project exceeds its costs by or above a certain required ratio. Amended and Restated Operating Agreement of PJM Interconnection, L.L.C., PJM Interconnection, L.L.C. Rate Schedule FERC No. 24, Docket No. ER11-4040-000, Schedule 6, Section 1.5.7(d).

26. In order for a market efficiency project to be considered for approval, the benefit-cost ratio must exceed a ratio of 1.25:1. Amended and Restated Operating Agreement of PJM Interconnection, L.L.C., PJM Interconnection, L.L.C. Rate Schedule FERC No. 24, Docket No. ER11-4040-000, Schedule 6, Section 1.5.7(d).

27. The Benefit/Cost ratio is calculated by dividing the present value of the total annual benefit for each of the first 15 years of the life of the enhancement or expansion by the present value of the total annual cost for each of the first 15 years of the life of the enhancement or expansion. Transource St. 3 at 18-19.

28. PJM utilizes a computer simulation software known as ProMod to calculate the total benefit for a market efficiency project. Transource St. 7-R at 24. ProMod forecasts future congestion over a specified period on the bulk electric grid. The model then determines what the difference in net load payments would be without and with a proposed market efficiency project. See e.g. Transource St. AA-3, Exh. TJH-AA3.

29. Net Load Payments are defined as gross load payments minus any financial transmission rights hedges. Tr. 2608-2609. Gross load payments are calculated as the zonal Locational Marginal Pricing (LMP) times the megawatt of load associated with those specific zones. Id. Financial transmission rights hedges are pre-determined congestion hedges allocated to load customers, and thus removed from gross load payments. Id.

30. The change in net load payments is measured for all of PJM's transmission zones over a period of 15 years starting from the RTEP Study Year and discounted to present value. OCA St. 1 at 8-9.

31. The benefits for a Lower Voltage Market Efficiency Project, such as the IEC Project, is 100 percent of the change in net load payments over a period of 15 years from the RTEP Study Year, discounted to present value. OCA St. 1 at 7-9; see also Transource Hearing Exh. 18. This excludes the change in net load payments for transmission zones that would see an overall increase as a result of constructing the market efficiency project. OCA Hearing Exh. 1, Transource Response to OCA-II-15.

32. The cost of a market efficiency project is the present value revenue requirement that benefitting transmission zones would be expected to pay over a period of fifteen years beginning in the RTEP Study Year. OCA St. 1 at 11.

33. Once a market efficiency project is selected, PJM conducts annual re-evaluations to determine if the project still meets the 1.25:1 benefit-cost ratio. Transource St. 7-R, Exh. SRH-3R at 14-15.

B. Congestion on the AP South Reactive Interface

34. Prior to 2014, the AP South Reactive Interface had experienced a large amount of congestion costs on an annual basis. OCA St. 3 at 12.

35. Congestion on the AP South Reactive Interface totaled approximately $800 million from 2012 to 2016. Transource St. 3 at 25.

36. The IEC Project was specifically designed to address congestion on the AP South Reactive Interface. Transource St. 3 at 24, Transource St. 8-R, Exh. TH-5R at 2

37. In 2014, congestion costs on the AP South Reactive Interface was approximately $486.8 million, or 25.2 percent of total PJM congestion costs experienced that year. OCA St. 3 at 12.

38. In 2016, congestion costs on the AP South Reactive Interface was approximately $16.8 million, or 1.6 percent of total PJM congestion costs experienced that year. OCA St. 3 at 12.

39. In 2017, congestion costs on the AP South Reactive Interface was approximately $21.6 million, or 3.1 percent of total PJM congestion costs experienced that year. OCA St. 3 at 12.

40. In 2018, congestion costs on the AP South Reactive Interface was approximately $21.6 million, or 3.1 percent of total PJM congestion costs experienced that year.

41. In 2019, congestion costs on the AP South Reactive Interface was approximately $14.5 million. Tr. at 2921.

42. Through the first quarter of 2020, congestion on the AP South Reactive Interface was less than $900,000, failing to reach the top 25 most congested constraints on the PJM system. OCA Hearing Exh. 6 at 559.

43. Since the selection of the IEC Project peak demand in the PJM region has decreased. OCA St. 2 at 16. When the proposal for the IEC was submitted in 2015, the most recent summer peaks for BGE, Pepco, and Dominion were from 2014 and totaled 31,773 MW. Id. By 2017, these peak loads had decreased to 31,450 MW. Id. The 2018 forecast of the 2020 peak load for the three companies, at 33,016 MW, has dropped by more than 3,300 MW in the past three years. Id.

44. Congestion event hours on the AP South Reactive Interface has dropped precipitously beginning in 2015. The day ahead congestion hours over the 2008-2014 period averaged 4,259 hours per year at the AP South Reactive Interface. This dropped to an average of 1,225-day ahead congestion hours per year for the 2015-2017 period. OCA St. 3 at 10-12.

45. This downward trend is continuing in light of the novel coronavirus (COVID-19) pandemic. See OCA Hearing Exhibit No. 3, Transource Response to OCA-XLVIII-1. During March and April 2020, weekday peak loads were ranging anywhere between 6.5% and 15.2% lower than originally projected. Id. PJM's load forecasts will be impacted for the foreseeable future. Id., Att. at 8-9.

46. Decreases in PJM's load forecast can reduce the projected benefits of the IEC Project. Transource St. AA-3, Exh. TJH-AA3. A one percent decrease reduces the expected decrease in net load payments for the benefitting zones by approximately $73.57 million, from $844.8 million to $771.23 million. Compare Transource St. AA-3, Exh. TJH-AA3 at 3, 22.

C. Excluding Detrimental Impacts from PJM's Benefit-Cost Methodology

47. When measuring the benefits of a market efficiency project, PJM excludes increased costs that are experienced as a result of constructing that project.

Transource St. 7-R, Exh. SRH-3R at 12-13; see also OCA Hearing Exh. 1, Transource Response to OCA-II-15.

48. When calculating the benefits of the IEC Project, Transource calculated the reduced power costs (primarily in MD-DC-VA) from being able to import lower-cost power into that region; but it failed to subtract from those benefits the higher costs that would result in other regions (including Pennsylvania) because they would no longer have the benefit of that same lower-cost power. OCA St. 1 at 24; see also Transource St. AA-3, Exh. TJH-AA3, OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4

49. The purpose of a benefit-cost analysis is to attempt to capture the likely consequences of an activity, and to express those consequences in the same units (dollars, in this case) so that they can be compared. OCA St. 1 at 23.

50. For Regional Market Efficiency Projects (voltages above 500 kV, or double circuit facilities planned to operate at voltages of at least 345 kV, but less than 500 kV), PJM previously included in its benefit calculation transmission zones that experience an increase in wholesale power prices. OCA Cross Ex. 4 at 4, 8. In 2014, PJM removed this from the benefit calculation to "increases [sic] the number of projects that could qualify as a market efficiency project." Id., at 8.

51. Under a proper benefit-cost analysis, the Company's most recent re-evaluation of the IEC Project demonstrates that it would decrease wholesale power prices in certain transmission zones by approximately $845 million and increase wholesale power prices in other transmission zones by approximately $812 million for a net benefit of $32 million. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4. When dividing the net benefit of the IEC Project by the present value revenue requirement of the IEC Project that amounts to a benefit-cost ratio of 0.06.

D. PJM Changes to its Benefit-Cost Methodology

52. In 2014, PJM initiated a proceeding before the Federal Energy Regulatory Commission at Docket No. ER14-1394-000 to modify portions of its existing benefit-cost methodology. Transource St. 7-R at 13.

53. For lower voltage market efficiency projects, PJM modified the benefit metric from its current 70/30 weighted split between the change in production cost and change in net load payment (for Energy Benefit) to 100 percent change in net load payments (for Energy Benefit). OCA Cross Exh. at 9.

54. The total change in energy production costs refers to the change in system generation variable costs (i.e. fuel costs, variable operating and maintenance costs, and emissions costs) associated with total PJM energy production or the amount by which the Project would lead to the more efficient use of generation resources throughout all of PJM. OCA St. 1-SR at 9.

55. With respect to Regional and Necessary Lower Voltage Market Efficiency Projects, PJM proposed to modify the benefit metric from its current 70/30 weighted split between the change in production cost and change in net load payment (for Energy Benefit) to 50/50 percent split. OCA Cross Exh. 4 at 6.

56. The IEC Project's production cost savings was forecasted to be approximately $260.13 million in its September 2018 re-evaluation. OCA St. 1SR at 9.

57. Under PJM's methodology for higher-voltage market-efficiency projects, system level production cost savings would receive a 50% weighting in determining the project's benefits. The other 50% would be made up of savings in the benefiting zones. OCA St. 1SR at 10. If that methodology were used for this Project based upon its September 2018 re-evaluation results, it would result in the Project's 15-year discounted "benefits" being calculated to be: (50% x $260.13 million) + (50% x $707.29 million) = $483.71 million. Id. This is less than the Project's 15-year discounted cost of $498 million, meaning that the Project would fail to provide a benefit-cost ratio of 1.0, let alone PJM's required ratio of 1.25 or higher. Id.

58. PJM's most recent analysis of the IEC Project, inclusive of the alternative configuration of the East Portion of the IEC Project, indicates that if the Project were constructed PJM would experience system-wide savings of approximately $150 million, much less than what was forecasted in September 2018. See Transource Ex. TJH-AA3.

59. In December 2018, PJM sought approval from FERC to modify the ProMod simulation used to forecast the benefits of a market efficiency project by removing from the simulation all potential future generation with an executed Facilities Study Agreement (FSA Generation). Transource Hearing Exh. 19 at 1.

60. A Facilities Study Agreement is a signed agreement between the customer, or the developer of the proposed generation, and PJM to identify the scope of facility

additions and upgrades to be included in the Facilities Study. PJM Manual 14A at 68.

61. According to PJM, 36 percent of generation with an executed FSA reaches commercial operation. Transource Hearing Exh. No. 19 at 3.

62. FERC issued an Order adopting this change to the ProMod model used to simulate future congestion on the bulk electric grid. Transource Hearing Ex. No. 19 at 12.

63. PJM's September 2018 ProMod analysis showed that the benefit-cost ratio of the IEC Project was 1.40. OCA St. 1 at 33. The model showed that there would be a decrease of $707.29 million in net load payments over a period of 15 years, excluding those zones that experience an increase. Id. After excluding executed FSA generation from the model, PJM determined that the benefit-cost ratio of the IEC Project in February 2019 was 2.17. Transource Hearing Exh. No. 6. The model showed that there would be a decrease of $982.07 million in net load payments over a period of 14 years, excluding those zones that experience an increase. OCA Hearing Exh. No. 2 at 2. That is a difference of approximately $275 million between the two simulations.

64. In the IEC Project's most recent re-evaluation FSA Generation was not included in the model used to simulate the benefits of the Project. OCA Hearing Exhibit No. 3, Transource Response to OCAXLVII-3. This included removing significant future solar capacity and other low-cost generation that may be online in future years in Virginia and Maryland. OCA Hearing Exhibit No. 3, Transource Response to OCAXLVII-4.

65. Virginia passed the Grid Transformation and Security Act of 2018, encouraging the construction of renewable energy sources and the implementation of demand-side management programs. OCA St. 3 at 19-20. The District of Columbia City Council passed an Act requiring that 100 percent of electric energy used in Washington D.C. should be supplied by solar power by 2032. CLEANENERGY DC OMNIBUS AMENDMENT ACT OF 2018, D.C. Act 22-583 (2019).

E. Subsequent Re-Evaluations of the IEC Project's Benefits and Costs

66. PJM's licensed-computer software presents a forward looking picture over a period of approximately fifteen years into the future, which includes numerous, diverse variables, assumptions, and forecasts that must be simulated, including, but not limited to: new sources of generation, retired generation, forecasted load,

changes to transmission topology, fuel and other economic data, monitored flowgates for systems adjoining PJM, and energy efficiency and demand response initiatives. See Transource St. 7-R at 30-32, TPA St. 8-R at 23

67. Each variable and forecast simulated in the model may be based upon further assumptions needed to identify a realistic expectation of future changes. For example, forecasted load incorporates within it equipment indices that reflect trends in energy efficiency (state-approved and other), demand response, and distributed energy. Transource St. 8-R at 16.

68. As part of its market efficiency process, PJM performs a sensitivity analysis demonstrating what the change to the benefit-cost ratio would be under certain circumstances. Transource St. 8-R, Exh. TH-3R at 21.

69. In certain sensitivity scenarios, such as whether the cost of natural gas was higher than expected, the benefit-cost ratio of the IEC Project decreases. Transource St. 8-R, Exh. TH-3R at 21.

70. In September 2017, the impacts of the IEC Project were re-evaluated according to PJM's annual Regional Transmission Planning Process. See PJM Manual 14B: PJM Region Transmission Planning Process, Section 2.6.8: Ongoing Review of Project Costs. A year after PJM's initial approval, the IEC Project was now forecasted to lower the cost of wholesale power prices in the PJM region by approximately $611.48 million dollars, or approximately $610 million less than the previous year's projections. OCA St. 1 at 30. Similarly, the IEC Project would increase wholesale power prices in the PJM region by approximately $326.57 million, or $524 million less than the previous year's projections. Id. According to PJM's cost-benefit methodology, the benefit-cost ratio of the project fell to 1.3. OCA St. 1 at 20-21. The same transmission zones that were shown to primarily benefit in August 2016, still benefited, yet to a much smaller degree. Similarly, the zones that were harmed in the September 2016 evaluation, would still face increased wholesale power prices, but to a much smaller degree.

71. Under the September 2018 re-evaluation, PJM's simulations now demonstrated that the IEC Project would lower the cost of wholesale power prices in the PJM region by approximately $707.29 million dollars, or approximately $96 million more that than the September 2017 simulation. OCA St. 1 at 21. The IEC Project would now increase wholesale power prices in the PJM region by approximately $690 million, or approximately $363.43 million more than the September 2017 simulation. OCA St. 1 at 33. PJM's simulation demonstrated a net decrease of

approximately $17 million in wholesale power prices across the entire PJM region, the smallest net difference since approval of the IEC Project. Id. According to PJM's cost-benefit methodology, the benefit-cost ratio of the project, which did not take into account any increases in wholesale power prices, increased to 1.42. After this evaluation, PJM's simulations showed a significant shift in the benefitting and harmed zones. For example, six PJM transmission zones that once experienced a benefit from the IEC Project were now forecasted to pay higher electric power prices. This list included the following: AEP, which is located in portions of Virginia, West Virginia, and Ohio, Linden VFT Merchant Transmission Facility (LINDVFT) located in New Jersey, Commonwealth Edison Zone (COMED) located in Indiana, Hudson Merchant Transmission Facility (O66HVDC), Duke Energy Ohio and Kentucky Zone (DEOK) located in portions of Ohio and Kentucky, Dayton Power and Light Zone (DAY) located in Ohio, and the Duquesne Light Company Zone (DUQ) located in Western Pennsylvania. See OCA Cross Exh. 10, OCA Cross Exh. 11. Under this simulation only four PJM transmission zones out of the existing twenty-four zones were projected to benefit from the IEC Project.

72. The February 2019 simulation projected that the IEC Project would lower the cost of wholesale power prices in the PJM region by approximately $982 million dollars, or $275 million more than the September 2018 simulation. OCA Hearing Exh. 2 at 2. Similarly, PJM's simulation projected the IEC Project would increase wholesale power prices in the PJM region by approximately $969 million, or $279 million more than the September 2018 simulation. Id. Under the February 2019 simulation, PJM projected that there would be a net decrease of approximately $13 million in wholesale power prices across the entire PJM region. Id. According to PJM's cost-benefit methodology, the benefit-cost ratio of the project for this re-evaluation was 2.17. The PJM transmission zones primarily benefitting from the IEC Project once again are DOM, PEPCO, BGE, APS, and AEP. Moreover, COMED, DAY, and DUQ, which were originally supposed to benefit from the IEC Project only to recognize detrimental impacts in subsequent re-evaluations, are once again benefiting from the IEC Project, yet to a much smaller degree than before. LINDVFT, O66HVDC, and DEOC, which were once expected to benefit from the IEC Project, were still projected to be harmed if this Project is built. Lastly, though more zones are projected to benefit from the IEC Project than the September 2018 re-evaluation, the majority of PJM transmission zones were still expected to experience an increase in wholesale power prices as a result of the IEC Project. Tr. at 2616.

F. Impacts to the PJM Region

73. In December 2019, Transource submitted PJM's latest re-evaluation of the economic benefits of the IEC Project, inclusive of the alternative IEC East Portion of the Project. Transource St. No. AA-3, TPA Ex. TJH-AA3. Specifically, the Company's most recent evidence alleges that the IEC Project will have a benefit-cost ratio anywhere from 1.46 to 1.66, depending upon the cost of the project and load simulated in future years. TPA St. No. AA-3 at 4. The Company provides a more detailed breakdown claiming that for the zones that benefit, *i.e.* the zones that will experience a decrease in wholesale power prices, will realize over $844 million in decreased power prices over a period of fifteen years between 2023 and 2037, discounted to present value. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4. The transmission zones that are harmed will experience increased wholesale power prices of approximately $812 million over that same period of time. Id.

74. Under the latest simulation, load-serving entities in the following states would experience increased wholesale power prices as a result of the IEC Project: portions of Pennsylvania, Maryland, New Jersey, Delaware, Kentucky, Ohio, and Illinois. OCA Hearing Ex. No. 3, Transource Response to OCA-XLIII-4; see also OCA Cross Exh. 10, Tr. 2613-2616.

75. As demonstrated in the most-recent simulation, load-serving entities in the PECO Transmission Zone, located in Southern Pennsylvania, would experience an increase of approximately $144 million in wholesale power prices over a 15-year period, those in the PLGRP Transmission Zone, located in Eastern Pennsylvania, would experience an increase of $166 million, those in the PSEG Transmission Zone, located in New Jersey, would experience an increase of $138 million, those in the METED Transmission Zone, located in central-Southern Pennsylvania, would experience an increase of $67 million, those in the JCPL Transmission Zone, located in New Jersey, would experience an increase of $86 million, those in the PENELEC Transmission Zone, located in central and Northern Pennsylvania, would experience an increase of $50 million, those in the DPL Transmission Zone, located in Eastern Maryland and Delaware, would experience an increase of $59 million, those in the AECO Transmission Zone, located in New Jersey, would experience an increase of $32 million, those in the FE-ATSI Transmission Zone, located in Northern Ohio, would experience an increase of $24 million, those in the NEPTHVDC Transmission Zone would experience an increase of $15 million, those in the RECO Transmission Zone, located in Northern New Jersey, would experience an increase of $4 million, those located in the DUQ Transmission Zone, located in Western Pennsylvania, would experience an increase of $1 million, those in the DEOK Transmission Zone,

located in Southern Ohio and Northern Kentucky, would experience an increase of $8 million, and those in the COMED Transmission Zone, located in Southern Illinois, would experience an increase of $16 million. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4, see also OCA Cross Exh. 10, 11.

76. As demonstrated in the most-recent simulation, load-serving entities in the DOM Transmission Zone, located in Virginia and Northern North Carolina, would experience a decrease of approximately $406 million in wholesale power prices over a 15-year period, those in the PEPCO Transmission Zone, located in Washington D.C. and Eastern Maryland, would experience a decrease of $171 million, those in the BGE Transmission Zone, located in central Maryland, would experience a decrease of $107 million, those in the APS Transmission Zone, located in West Virginia, Virginia, Maryland, and Western Pennsylvania, would experience a decrease of $60 million, those in the AEP Transmission Zone, located in Virginia, West Virginia, Ohio, and Kentucky, would experience a decrease of $84 million, those in the DAY Transmission Zone, located in Western Ohio, would experience a decrease of $9 million, and those in the EKPC Transmission Zone, located in Eastern Kentucky, would experience an decrease of $7 million. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4, see also OCA Cross Exh. 10, 11.

77. According to PJM's December 2019 analysis of the IEC Project, when netting any cost savings recognized by those Transmission Zones benefiting from the IEC Project against any increased costs to those Transmission Zones impacted by the IEC Project, the total impact of the IEC Project is a net decrease of $32.5 million in wholesale power prices over a period of 15 years. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-4.

78. The costs to construct the IEC Project must be collected from load-serving entities in the transmission zones that do benefit from this project, *i.e.* load-serving entities in Virginia, Maryland, Washington D.C., and Western Pennsylvania. Transource St. 8-R, Exh. TH-3R at 28. The greater a transmission zone benefits from the IEC Project, the more costs that transmission zone is expected to pay. OCA St. 1 at 36-37.

79. Over the first 15 years of the service life of the IEC Project, the IEC Project has a revenue requirement of approximately $527.6 million, discounted to present value, based upon a Project capital cost of $496.17. Transource St. AA-3, Exh. TJH-AA3 at 4.

80. The IEC Project is not subject to a cost cap and is entitled to seek any reasonable and prudent expenses that exceed the estimated cost of the IEC Project. Applications, Att. 2, App. 2.3; see also Tr. at 2111-12. The benefitting zones would be required to pay any additional overrun.

81. Congestion is a natural economic occurrence sending energy price signals to load-serving entities on the constrained side to build additional low-cost generation to mitigate congestion. Tr. at 2266.

82. Constructing the IEC Project will create reliance on distant generation resources located North and South of the constraint, rather than local, low-cost generation, making the system less reliable as a whole. Tr. at 2396-97.

83. Monitoring Analytics, LLC is the Independent Market Monitor of PJM and is charged with promoting a robust, competitive, and nondiscriminatory electric power market in PJM. Tr. at 2619.

84. In the Independent Market Monitor's most recent PJM State of the Market Report, the Independent Market Monitor recommended that PJM's market efficiency process be eliminated.

G. Impacts to Pennsylvania

85. The latest re-evaluation of the 'benefits' of the IEC Project demonstrates that of the Company's purported $845 million in economic 'benefits,' approximately $27 million will accrue to load-serving entities in Western Pennsylvania in the first fifteen years of the IEC Project's useful life, or approximately 3.2 percent of the total purported 'benefits.' See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-15. The APS zone is composed of a portion of Western Pennsylvania, West Virginia, Maryland, and Virginia. See OCA Cross Exh. 10. PJM's latest re-evaluation indicates that APS will see reduced wholesale power prices of approximately $60 million over the first 15 years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-15. To calculate Pennsylvania's share of the benefits, the OCA's witness measured Pennsylvania's percentage of peak demand contributed to the APS system in the summer of 2018, which was approximately 44.75 percent. OCA St. 1, Sch. SJR-6. Accordingly, Pennsylvania would likely experience approximately $27 million in reduced wholesale power prices for the first fifteen years of the IEC Project's service life, or 44.75 percent of the APS zone's benefit.

86. Under the most recent re-evaluation, the IEC Project will lead to an increase in wholesale power prices in Pennsylvania of approximately $429 million over the first fifteen years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLII-15. This number includes increases of approximately $166.1 million in the PLGRP Transmission zone, $143.6 million in the PECO Transmission Zone, $66.7 million in the METED Transmission Zone, $50.3 million in the PENELEC Transmission Zone, $1.8 million in the FE-ATSI Transmission Zone, and $0.9 million in the DUQ Transmission Zone. Id.

87. PJM's latest re-evaluation indicates that FE-ATSI will see increased wholesale power prices of approximately $24.5 million over the first 15 years of the Project's service life. OCA Hearing Exh. 3, Transource Response to OCA-XLIII-15. Pennsylvania only comprises a portion of the FE-ATSI Transmission Zone. See OCA St. 1, Sch. SJR-6 at 2. To calculate Pennsylvania's share of the detriment, the OCA's witness measured Pennsylvania's percentage of peak demand contributed to the FE-ATSI system in the summer of 2018, which was approximately 7.20 percent. OCA St. 1, Sch. SJR-6. Accordingly, Pennsylvania would likely experience approximately $1.8 million in increased wholesale power prices from the FE-ATSI Transmission Zone for the first fifteen years of the IEC Project's service life, or 7.20 percent of the FE-ATSI zone's detriment.

88. The IEC Project, as amended, consists of an extensive amount of additional transmission line across central Pennsylvania and two new substations. For the alternative IEC-East portion, the Furnace-Run to Conastone double circuit transmission line will be approximately 18 miles in total length, of which approximately 2 miles will be constructed in the expanded right-of-way with new transmission towers and 16 miles will be in the existing ROW on the existing towers. Amended IEC-East Application at 14. The Furnace Run-Graceton double circuit transmission line will be approximately 11 miles in total length, of which approximately 2 miles will be constructed in the expanded right-of-way with new transmission towers and 9 miles will be in the existing right-of-way on existing towers. Id. For the West Portion of the IEC Project, the Company seeks approval to construct a double-circuit 230-kV transmission line extending approximately 28.8 miles to connect the existing Ringgold Substation located near Smithsburg, Washington County, Maryland, and the proposed Rice Substation to be located in Franklin County, Pennsylvania. IEC-West Application at 4. Approximately 24.4 miles of the IEC-West portion will extend across Franklin County, Pennsylvania. Id. Furthermore, of the 24.4 miles spanning Franklin County, approximately 13.6 miles will be built over presently unencumbered land. IEC-West Application, Att. 3 at 93-95.

IV. Public Input Hearing Testimony

89. James Quesenberry, Jr. is a York realtor who sells lots, farms, and residential homes and is aware that peoples' perceptions of transmission lines has an effect on sale ability and values. Tr. 125, L. 17 - 25; 126, L. 1 – 13.

90. Most homeowners testified to valid concerns that the lines will bring their property value down. Tr. 668, L. 9 - 15; Tr. 672, L. 9 - 10; Tr. 678, L. 24 - 25; Tr. 685, L. 2 – 10 - 15 – 19 – 22 – 25 - 686, L. 1; Tr. 689, L. 9 – 16 - 691, L. 16 - 19; Tr. 701, L. 5-10; Tr. 705, L. 14 - 18; Tr. 710, L. 8 - 12; Tr. 820, L. 8 - 19; 830, L. 5 - 9; Tr. 842, L. 4 - 14; Tr. 851, L. 2 - 5; Tr. 853, L. 11 - 19; Tr. 855, L. 16 – 8 - 856, L. 17 - 19; Tr. 859, L. 1 - 2; Tr. 879, L. 16 - 22; Tr. 915, L. 1 - 9; Tr. 920, L. 4 - 13; Tr. 937, L. 9 - 15; Tr. 957, L. 8 - 14; Tr. 1011, L. 15 - 20; Tr. 1022, L. 24-25 - 1023, L. 1 - 11; Tr. 1062, L. 22 - 25; Tr. 1067, L. 12 – 25 - 1068, L. 1 - 4; Tr. 1079, L. 4 - 5; Tr. 1134, L. 15 – 19.

91. Patrice Nitterhouse is a real estate developer who testified to concerns as to how the project will negatively affect the value of her property. In addition, the decrease in the value of the property will affect her business. Tr. 762, L. 22-25 - 763, L. 1-6.

92. Carol A. Pugh from Franklin County had a list of questions she wanted answered through email from Transource. Abby Foster returned her email but with general information and no answers. She asked as to how the project will affect her property value and the answer she received was, "there's too many variables to know." Tr. 798, L. 14 – 23.

93. Georgiana Horst's, co-owner of Horst Seed Hybrids in Chambersburg, farm is known as a Bicentennial Farm by the Department of Agriculture. This project will diminished the historical value of the property and Historical Bus Tours will stop traveling through her farm affecting her business. Tr. 881, L. 16-21

105. Property owners in Franklin County whom have their land preserved. Tr. 672, L. 4 - 7; Tr. 674, L. 17 - 23; Tr. 850, L. 8 – 10 - 851, L. 6 – 10.

106. Homeowners who show health concerns regarding the power lines. Tr. 670, L. 16 - 19; Tr. 689, L. 9 – 16; Tr. 696, L. 16 - 21; Tr. 701, L. 16 - 21; Tr. 790, L. 1 - 8; Tr. 820, L. 20 - 25; Tr. 828, L. 17 - 19; Tr. 845, L. 3 - 14; Tr. 853, L. 20 – 25 - 854, L. 1 - 3; Tr. 855, L. 14 - 16; Tr. 858, L. 20 - 22; Tr. 880, L. 18 - 24; Tr. 914, L. 21 - 25; Tr. 935, L. 2 - 11; Tr. 957, L. 24 – 25 - 958, L. 1 - 2; Tr. 1035, L. 10 - 13; Tr. 1103, L. 22 – 25 - 1104, L. 1 – 20.

107. Property owners showing concerns of stray voltage that shock themselves and their animals. Tr. 673, L. 2 - 5; Tr. 678, L. 5 - 12; Tr. 680, L. 11 - 13; Tr. 689, L.

22 – 25 - 690, L. 1 - 5; Tr. 716, L. 2 - 8; Tr. 799, L. 14 - 25; Tr. 829, L. 16 - 19; Tr. 843, L. 6 - 19; Tr. 876, L. 13 - 9; Tr. 880, L. 3 – 7 – 12 – 17 - 881, L. 4 - 9; Tr. 914, L. 17 - 21; Tr. 963, L. 23 – 25 - 964, L. 1 -13; Tr. 1062, L. 9 - 12; Tr. 1085, L. 5 - 11; Tr. 1133, L. 1 - 11; Tr. 1141, L. 23 – 25 - 1142, L. 1 – 5.

108. Homeowners who use well water show concerns over the pollution of the water. Tr. 701, L. 10 - 13; Tr. 1024, L. 16 - 17; Tr. 1034, L. 19 – 24.

109. Consumers testified to major concerns over the destruction of Falling Springs in Franklin County. It is known to be fished by Presidents Carter and Eisenhower. In addition, it is widely known to fly fishers. The PA Fish and Boat Commission, the Department of Environmental Protection, and many other books and fish magazines recognize Falling Springs. Tr. 791, L. 22 - 25; Tr. 1014, L. 15 – 25 – 1015, L. 1 – 6 – 13 - 1017, 9-11 – 21 - 23; Tr. 1055, L. 12 – 25 - 1056, L. 1 - 7; Tr. 1141, L. 14 – 23.

110. State Representative Rob Kauffman testified to concerns over the Falling Spring watershed. The spring branch is a limestone-fed spring that is widely considered one of the most abundant waterways on the East Coast for wild rainbow trout. There are concerns of the power lines damaging the spring. Tr. 1010, L. 17 – 20 - 1051, L. 1 – 7 – 8 – 25.

111. Chris Rudy, from Trout Unlimited, pointed out that Transource maps do not show Falling Springs as wetlands when in fact it is. In addition, the spring is valued as a high quality cold-water fishery. Tr. 1050, L. 8 – 25.

112. Carl Helman lives along Falling Springs and has concerns about the wildlife that depend on the spring. In addition, he testified to major concerns of the construction of the monopoles and the effects on the underground supports for his water supply system. Tr. 1071, L. 6 – 22.

113. Business owners and property owners testified to concerns over the effect on farm animals, growth of vegetation, crops and fruit with the construction of the monopoles. Tr. 668, L. 16 – 25 - 669, L. 1 - 4; Tr. 846, L. 13 – 225 - 847, L. 1- 2; Tr. 850, L. 18 – 24.

114. Property owners and citizens of York and Franklin counties testified to concerns of how the power lines will affect local businesses and economic growth. Tr. 682, L. 2 - 12; Tr. 694, 25 - 695, L. 1 - 13; Tr. 715, L. 21 – 25 - 716, L. 1 - 11; Tr. 880, L. 3 - 13; Tr. 1059, L. 17 – 24.

115. Janet Pollard works for the Franklin County Visitors Bureau, and visitors' perception is valued highly. If visitors do not like the character of a place, they will not come back to it. Franklin County is known for its agriculture, wildlife recreation, scenery, animal habitats, and historical features like the Underground

Railroad. The transmission lines will affect the tourist attraction to Franklin County. Tr. 943, L. 18 – 25 - 944, L. 1 -13 - 945, L. 21 – 25 - 946, L. 1 – 16 – 23.

116. Heather Stine's family of Franklin County, rents land to a local farmer who is certified organic. There are reasons to be concerned over the spraying on the land that could affect revenue. Tr. 1079, L. 10 – 23.

117. Many homeowners have valid concerns over the damage of fertile land being compacted or destroyed, trees, and crops when it comes to the construction and maintenance of the towers. Tr. 672, L. 13 - 20; Tr. 675, L. 22 - 25, Tr. 706, L. 19 – 25 - 707, L. 1 - 3; Tr. 800, L. 16 - 21; Tr. 879, L. 23 – 25 - 880, L. 13; Tr. 1019, L. 23 – 25 - 1020, L. 1 – 15.

118. Willa Weller Kaal expresses that Franklin County is rich with history and testified to concerns of historical artifacts and sites being destroyed with the construction of the monopoles. Tr. 669, L. 23 – 25 - 670, L. 1 – 13.

119. Brian Brechbill of Franklin County has lines running through his property. His land was destroyed with the construction of the monopoles. The company did pay him $5,000 but it was not enough to recover what he lost. Judge Barnes questioned him as to whom the company was and he stated he believes it was First Energy. Tr. 676, L. 6 – 13 – 20 – 23.

120. Janet Ward testified to a big concern about the effect the project will have on Falling Spring. The drilling will damage an underground limestone spring that feeds the creek. Tr. 789, L. 21 – 25.

121. Kerry Bumbaugh is a Township Supervisor for Quincy Township and President of the Franklin County Association of Township Supervisor. He has been called out to several areas where drilling has already been started and damages were done. He also explains that the cost of roadways are expensive to repair and it can cause a depression that may cause someone to hit, be run off the road that cause injuries or possibly death. In addition, the township was not made aware of any construction prior to it starting and that violates zoning ordinances. Tr. 861, L. 8 – 22 - 862, L. 6 – 12 – 864, L. 1 – 4 - 868, L. 6 – 13; 985, L. 20 - 25 - 986, L. 1 – 20.

122. Janet Pollard works for the Franklin County Visitors Bureau, and she states that the preconstruction, construction, and maintenance of the monopoles disrupts wildlife habitats. Tr. 944, L. 14 – 25 - 945, L. 1 – 15.

123. Kerry Bumbaugh is a Township Supervisor for Quincy Township and President of the Franklin County Association of Township Supervisor. He testified to many concerns about the residents' privacy in regards to people coming on their property, and helicopters or drones flying over the properties. Tr. 864, L. 5 – 10.

124. Linda Mower had equipment and surveyors on both her properties and her in-laws before the application has been approved and without warning. TR. 913, L. 19 -25 - 914, L. 1 – 2.

125. Property owners have valid concerns regarding the safety of using certain tools around the power lines and the spraying herbicides. Tr. 672, L. 21 - 25; Tr. 690, L. 20 – 25 - 691, L. 1; Tr. 880, L. 3 - 7; Tr. 915, L. 10 - 18; Tr. 1052, L. 18 – 21.

126. Brian Brechbill of Franklin County has a farm with a transmission line already running through his property. He testifies that the lines cause his GPS equipment to become unreliable or sometimes does not work when used under the power lines. Tr. 675, L. 4 – 21.

127. Lois White has two monopoles already on her property and it is very hard to maneuver large equipment around them. In addition, she testified to concerns regarding GPS. OCA questioned about the company who owns the monopoles and Ms. White stated it is West Penn. Tr. 705, L. 19 – 25 - 706, L. 1 – 2 - 707, L. 4 – 13.

128. Linda Mower's in-laws, who are in their 80's, owns an airstrip on their farm. They raise concerns for those pilots taking off and landing near the monopoles. Tr. 916, L. 12 – 25.

129. Ann Fincuane lives across from a field that is known to get sinkholes almost every year. She is concerned about the monopoles that will be built there and a sinkhole forms. Tr. 1090, L. 3 – 9.

130. Owners with wooded areas as part of their land are concerned about the destruction that the towers would bring. Tr. 707, L. 21 – 24.

131. Janet Pollard testified to concerns of forest areas being removed, which will change animal habitats and plant life as well. Tr. 945, Tr. 16 – 20.

132. Todd Sommer is the owner of Sommer Springs Farms and is a supervisor for a utility company. He has personally experienced utility companies bringing in their own crew after promising to hire local. Tr. 610, L. 1 – 11.

133. Katie Hess is the Director of the Conservation Landscape Initiative in the Franklin County Region called South Mountain Partnership. The soils that will be affected by the project represent one of the largest contiguous areas of high-quality soil in PA. In addition to her testimony, she provided a packet of information from numerous organizations in PA. Tr. 752, L. 9 – 14 - 759, L. 19 – 25 - 760, L. 1 – 25.

134. Sharla Dunlap owns property that does not show up on Transource's map of the project and the line will be approximately 300 feet from her back porch. Tr. 826, L. 15 - 23.

135. Eugene Macri, Jr., an aquatic and environmental scientist, has done numerous studies in Pennsylvania regarding environmental damage. According to public resources and reported federal agencies, PA is considered the most polluted state in the nation. Tr. 832, L. 22 – 25 - 833, L. 1 – 16.

136. Ruth Frech testified to concerns that the map provided on the plan route will barely affect her but looking closely at the map, you will see the power line will being less the 250 feet from her house. This is less than the length of a football field. Tr. 841, L. 1 – 4.

137. Fred Rice is on the Guilford Township Zoning Board and they have a zoning law that a building cannot be over 50 feet high. He points that the towers are going to be 130 feet. Tr. 877, L. 6 – 12.

138. Georgiana Horst, co-owner of Horst Seed Hybirds, has no other retirement plan available to her with the exception of her farm that is her business. Tr. 881, L. 10 – 15.

139. Travis Schooley, a chief water operator, engineering coordinator and grant writer for Quincy Township, has not received any information, map update, or permits, regarding the project, as they should according to the local ordinances. Tr. 888, L. 5 – 16.

140. Heather Stine family owns land on the proposed route where it is believed to be a Native American Indian Burial site. Tr. 1078, L. 5 – 12.

141. Leslie Bowman will be affected by this project and already has monopoles on their property. Transource disregarded her request to use a paved right a way to drive to the poles and drove the entire length of her wheat growing crop field. Tr. 1109, L. 10 – 15.

V. Availability of Reasonable Alternatives

142. The competitive model that PJM uses for resolving issues such as the congestion on the AP South Interfaces is referred to as a sponsorship model, where PJM looks at proposals that are submitted, identifies a solution, and the party who has submitted that proposal or sponsored that proposal is then designated to construct and later own, maintain and operate that facility. Tr. at 2272-73.

143. Other independent system operators or regional transmission operators implement other competitive bid models. Tr. 2275. California ISO has a procurement model, where California ISO would identify what they believe to be the most effective solution and then put it out for bid. Id.

144. Under PJM's sponsorship model, PJM can only review submitted proposals. Transource St. 7-R at 27-28.

145. All evaluated solutions to congestion on the AP South Reactive Interface were transmission-based solutions. Transource St. 8-R, Exh. TH-3R at 17.

146. PJM cannot require generation to be built. Transource St. 7-RJ at 8.

147. Sufficient low-cost generation in the constrained side of a congestion constraint can mitigate congestion. Tr. at 2648-49.

148. There are available non-wires alternatives that may address congestion on the AP South Reactive Interface including energy conservation, energy efficiency, demand response, solar resources, wind energy resources, and renewable energy storage. OCA St. 3 at 15-17.

149. PJM did not adequately consider energy efficiency resources, solar and wind renewable resources in combination with energy storage systems, and distributed generation resources. OCA St. 3 at 17-19.

150. In 2018, the Virginia General Assembly passed the Grid Transformation and Security Act of 2018, which became effective in March 2018, and finds that additional 5,000 megawatts (MW) of utility-scale solar and wind resource facilities is in the public interest, and encourages demand-side management programs capable of reduce customers' overall annual energy usage by 805 gigawatt-hours (GWh) and system peak demand by 304 MW by 2033. OCA St. 3 at 19-20.

151. The Maryland Legislature passed a law in April 2017 that mandated a 2% per year reduction in electric energy use. With Maryland's electric energy use in 2016 at over 93,000 GWH, the 2% mandate would be 1,868 GWH. OCA St. 3 at 24.

152. The District of Columbia's Department of the Environment conducted an analysis wherein they quantified the economic energy efficiency potential in the District of Columbia to be 5,537,521 MWh/yr in 2022. In addition the District of Columbia's Department of the Environment estimated that there is a technical potential of 2,498,000 MWh/year for rooftop PV and Urban Utility scale PV potential in the District of Columbia. OCA St. 3 at 22-24.

153. According to the United States Department of Energy 2016 Technical potential study there is 7,861 MW's of CHP technical potential in the District of Columbia, Maryland and Virginia.

154. PJM has not updated its modelling to include the Virginia Grid Transformation and Security Act of 2018, the 2017 Maryland law, or the Clean Energy D.C. Omnibus Act of 2018. Transource St. 7-R at 30.

VI. Other Relevant Issues

155. In November 2018, PJM ran a generation deliverability test without the IEC Project to determine if the existing transmission system without the Project could deliver energy from one aggregate of generation in one area to the aggregate of load in another. Transource St. 7-R at 22.

156. As a result of this generation deliverability test, PJM identified potential future n-1 Single Contingency Reliability Criteria Violations occurring in 2023 in the absence of constructing the IEC Project. Transource St. 7-R at 21. This includes overloads on the following: (1) Three Mile Island 500/230 kV Transformer, (2) Hunterstown-Lincoln 115 kV Line, (3) Lincoln Tap-Lincoln 115 kV line, and (4) Lincoln-Straban 115 kV Line. Id. The generation deliverability test also identified a potential future n-0 Reliability Criteria Violations occurring in 2023 in the absence of constructing the IEC Project on the Peach Bottom-Conastone 500 kV Line. Id., see also Transource St. 7-RJ-Supp at 2.

157. This Project is a market efficiency project designed to address congestion on the AP South Reactive Interface. Transource St. 8-R, Exh. TH-5R at 2.

158. It was not until November 2018, several months after the OCA's direct testimony in this proceeding, that PJM identified possible reliability violations occurring in the future if the Commission rejects the IEC Project for approval. Transource St. 7-R at 21.

159. The Company has repeatedly denied that this is a reliability project needed to resolve reliability violations. See Tr. at 2926; see also Transource St. 7-RJ-SUPP at 3.

160. The generation deliverability test is a subset of tests that PJM conducts to ensure compliance with reliability criteria. OCA St. 2-SSR at 16-17.

161. PJM did not perform its full suite of reliability tests to confirm or clarify the existing, nature, or scope of the alleged potential future reliability violations. Transource St. 7-RJ-SUPP at 3.

162. Many of the facilities that are expected to overload in 2023 are older facilities that are likely to be in need of replacement in the next few years. OCA St. 2-SSR at 9-10. OCA St. 2-SSR-10; OCA Hearing Exh. 5, MAIT Response to OCA-XXXVII-1.

163. Since the last generation deliverability test, two additional projects have been approved by PJM involving facilities that were projected to be overloaded in 2023: a rebuild of Mid-Atlantic Interstate Transmission LLC's Hunterstown-Lincoln 115 kV line and Project 5E, which involves re-conductoring BGE's Conastone-Graceton and Raphael Road-Northeast 230 kV lines together with adding bundled conductors to the Graceton-Bagley-Raphael Road double circuit lines. Transource St. AA-2, Exh. SRH-AA2 at 13.

164. PJM has not run another generation deliverability test to determine if Project 5E and the Hunterstown-Lincoln 115 kV projects are sufficient to cure any potential future reliability violations without the IEC Project. See OCA Hearing Exh. 3, Transource Response to OCA-XLIII-10.

165. PJM has a process to timely deal with any potential future reliability violations if the IEC Project is not approved. Transource St. 7-R at 24-25.

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**APPENDIX C**

PROPOSED CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the subject-matter of and the parties to this proceeding by virtue of Chapter 11 of the Public Utility Code, 66 Pa. C.S. §§ 1101, *et seq*., and 15 Pa. C.S. Section 1511(c).

2. The Applicant, Transource Pennsylvania, LLC, has not met its burden of proving, pursuant to Section 332(a) of the Public Utility Code that the Application for a Certificate of Public Convenience and Authority to exercise the power of eminent domain for the construction and installation of the facilities known as the West Portion of the Independence Energy Connection Project, including the proposed Rice Substation and the Rice-Ringgold 230 kV Transmission Line, is necessary or proper for the service, accommodation, convenience or safety of the public. 66 Pa. C.S. § 332(a); 66 Pa. C.S. § 1101, *et seq*.

3. The Applicant, Transource Pennsylvania, LLC, has not met its burden of proving that the proposed West Portion of the Independence Energy Connection Project is needed, pursuant to Section 57.76(a)(1) of the Commission's regulations. 52 Pa. Code § 57.76(a)(1).

4. The Applicant, Transource Pennsylvania, LLC, has not met its burden of proving that the proposed West Portion of the Independence Energy Connection Project would not create an unreasonable risk of danger to the health and safety of the public, pursuant to relevant Commission siting regulations. 52 Pa. Code § 57.76(a)(2).

5. The Applicant, Transource Pennsylvania, LLC, has not met its burden of proving that the proposed West Portion of the Independence Energy Connection Project is in compliance with applicable statutes and regulations providing for the protection of the natural resources of the Commonwealth. Pa. Const., Art. 1, § 27; 52 Pa. Code § 57.76(a)(3).

6. The Applicant, Transource Pennsylvania, LLC, has not met its burden of proving that the proposed West Portion of the Independence Energy Connection Project would have a minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives. 52 Pa. Code § 57.76(a)(4).

7. Joint Applicants, Transource Pennsylvania, LLC, and PPL Electric Utilities Corporation, have not met their burden of proving, pursuant to Section 332(a) of the Public Utility Code that the Application for a Certificate of Public Convenience and Authority to exercise the power of eminent domain for the construction and installation of the facilities known as the alternative configuration of the East Portion of the Independence Energy Connection Project, including the proposed Furnace Run Substation, the re-conductored Otter Creek-Conastone and Graceton-Manor 230 kV Transmission Lines, and the two new 2-mile segments connecting those re-conductored lines to the proposed Furnace Run Substation, is necessary or proper for the service, accommodation, convenience or safety of the public. 66 Pa. C.S. § 332(a); 66 Pa. C.S. § 1101, *et seq*.

8. Joint Applicants, Transource Pennsylvania, LLC, and PPL Electric Utilities Corporation, have not met their burden of proving that the proposed alternative configuration of the East Portion of the Independence Energy Connection Project is needed, pursuant to Section 57.76(a)(1) of the Commission's regulations. 52 Pa. Code § 57.76(a)(1).

9. The Applicant, Transource Pennsylvania, LLC, has not met its burden of proving that the proposed alternative configuration of the East Portion of the Independence Energy Connection Project would not create an unreasonable risk of danger to the health and safety

of the public, pursuant to relevant Commission siting regulations. 52 Pa. Code § 57.76(a)(2).

10. Joint Applicants, Transource Pennsylvania, LLC, and PPL Electric Utilities Corporation, have not met their burden of proving that the proposed alternative configuration of the East Portion of the Independence Energy Connection Project is in compliance with applicable statutes and regulations providing for the protection of the natural resources of the Commonwealth. Pa. Const., Art. 1, § 27; 52 Pa. Code § 57.76(a)(3).

11. Joint Applicants, Transource Pennsylvania, LLC, and PPL Electric Utilities Corporation, have not met their burden of proving that the proposed alternative configuration of the East Portion of the Independence Energy Connection Project would have a minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives. 52 Pa. Code § 57.76(a)(4).

PROPOSED ORDERING PARAGRAPHS

IT IS ORDERED:

1. That the Application of Transource Pennsylvania, LLC, filed pursuant to 52 Pa. Code Chapter 57, Subchapter G, For Approval of the Siting and Construction of the Proposed Pennsylvania Portion of the West Portion of the Independence Energy Connection Project in Portions of Franklin County, Pennsylvania, at Docket No. A-2017-2640200, be denied.

2. That the Joint Amended Application of Transource Pennsylvania, LLC, and PPL Electric Utilities Corporation filed pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Construction of the Proposed Pennsylvania Portion of the Alternative

Configuration of the East Portion of the Independence Energy Connection Project in Portions of Franklin County, Pennsylvania, at Docket No. A-2017-2640195, be denied.

3. That the Petition of Transource Pennsylvania, LLC for a Finding that a Building to Shelter Control Equipment at the Furnace Run Substation in York County, Pennsylvania, is Reasonably Necessary for the Convenience or Welfare of the Public, at Docket No. P-2018-3001878, be denied.

4. That the Petition of Transource Pennsylvania, LLC for a Finding that a Building to Shelter Control Equipment at the Rice Substation in Franklin County, Pennsylvania, is Reasonably Necessary for the Convenience or Welfare of the Public, at Docket No. P-2018-3001883, be denied.

5. That the Applications of Transource Pennsylvania, LLC, for Approval to Acquire a Certain Portion of Lands of Various Landowners in York and Franklin Counties, Pennsylvania for the Siting and Construction of the 230 kV Transmission Lines associated with the Independence Energy Connection – East and West Projects as Necessary or Proper for the Service, Accommodation, Convenience or Safety of the Public, at Docket Nos. A-2018-3001881, *et al.*, be denied.

**APPENDIX D**

GLOSSARY/LIST OF ABBREVIATIONS

- *ABB* – A company that specializes in electrification products, robotics and motion, industrial automation, and power grids.
- *AEP* – American Electric Power Zone
- *AP South Reactive Interface* – A set of four 500-kV transmission lines that originate in West Virginia and terminate in Maryland.
- *APS* – Allegheny Power Zone
- *BGE* – Baltimore Gas and Electric Zone
- *CAISO* – California's Independent System Operator
- *Citizens* – Citizens to STOP Transource – York County
- *COMED* – Commonwealth Edison Zone
- *Commission* – Pennsylvania Public Utility Commission
- *DAY* – Dayton Power and Light Zone
- *DEOK* – Duke Energy Ohio and Kentucky Zone
- *DOM* – Dominion Virginia Power Zone
- *DPL* – Delmarva Power and Light Zone
- *DUQ* – Duquesne Light Company Zone
- *East Portion of the IEC Project or IEC East*– Transource's plan, in cooperation with PPL, to re-conductor two existing 230 kV transmission lines currently owned and operated by PPL as double-circuit transmission lines and utilize existing PPL right-of-way to construct two additional two mile segments to connect the lines to the proposed substation portions of York County.
- *EDCs* – Electric Distribution Companies

- *EE&C Programs* – Energy Efficiency & Conservation Programs
- *FERC* – Federal Energy Regulatory Commission
- *FSA* – Facilities Studies Agreement
- *FTE-years* – Full-time Equivalent Years
- *FTR* – Financial Transmission Rights
- *GTSA* – Grid Transformation and Security Act of 2018
- *GWh* – Gigawatt-hour
- *HVDC* – High Voltage Direct Current
- *IEC Project or Project* – Independence Energy Connection Project
- *Independent Market Monitor* – Monitoring Analytics, LLC
- *JCPL* – Jersey Central Power and Light Zone
- *kV* – kilovolt
- *LINDVFT* – Linden VFT Merchant Transmission Facility
- *LMP* – Locational Marginal Pricing
- *MAIT* – Mid-Atlantic Interstate Transmission, LLC
- *MAPP* – Mid-Atlantic Power Pathway Project
- *METED* – Metropolitan-Edison Zone
- *MW* – Megawatt
- *MWH* – Megawatt Hour
- *NLP* – Net Load Payments
    - $\Delta NLP$ – Change in Net Load Payments
- *O66HVDC* – Hudson Merchant Transmission Facility
- *OCA* – Pennsylvania Office of Consumer Advocate

- *Original Configuration of the East Portion of the IEC Project* – Transource's original proposal to construct a Furnace Run Substation in York County and a new 230 kV transmission line extending 15.7 miles to connect the existing Conastone Substation located near Norrisville, Hartford County, Maryland to the proposed Furnace Run Substation in York County, also known as the Furnace Run-Conastone 230 kV line.
- *PATH* – Potomac Appalachian Transmission Highline Project
- *PECO* – PECO Energy Company
- *PEPCO* – Potomac Electric Power Zone
- *PJM* – PJM Interconnection, LLC
- *PLGRP* – Pennsylvania Power and Light Zone
- *PPL* – PPL Electric Utilities Inc.
- *ProMod* – The ABB software suite that PJM utilizes.
- *PSEG* – Public Service Electric and Gas Zone
- *PVRR* – Present Value of Revenue Requirements
- *ROW* – Right of Way
- *RTEP* – Regional Transmission Expansion Plan
- *SCC* – Virginia State Corporation Commission
- *STFC* – Stop Transource Franklin County
- *TEAC* – Transmission Expansion Advisory Committee
- *TMI* – Three-Mile Island
- *Transource or Company* – Transource Pennsylvania, LLC
- *VEPCO* – Virginian Electric and Power Company

- *West Portion of the IEC Project or IEC West* – Transource's plan to construct a new substation and 230-kilivolt (kV) transmission line spanning several miles in portions of Franklin County.
- *YCPC* – York County Planning Commission