

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Application of Transource Pennsylvania, LLC :  
for approval of the Siting and Construction of the :  
230 kV Transmission Line Associated with the : Docket No. A-2017-2640195  
Independence Energy Connection - East and : Docket No. A-2017-2640200  
West Projects in portions of York and Franklin :  
Counties, Pennsylvania. :

Petition of Transource Pennsylvania, LLC for a :  
finding that a building to shelter control :  
equipment at the Rice Substation in Franklin : P-2018-3001878  
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 : P-2018-3001883  
York County, Pennsylvania is reasonably :  
necessary for the convenience or welfare of the :  
public. :

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 : A-2018-3001881, *et al.*  
associated with the Independence Energy :  
Connection – East and West Projects as necessary :  
or proper for the service, accommodation, :  
convenience or safety of the public. :

DIRECT TESTIMONY OF  
SCOTT J. RUBIN

ON BEHALF OF  
THE OFFICE OF CONSUMER ADVOCATE

SEPTEMBER 25, 2018

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## Introduction

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Q. Please state your name and business address.

A. My name is Scott J. Rubin. My business address is 333 Oak Lane, Bloomsburg, PA.

Q. By whom are you employed and in what capacity?

A. I am an independent consultant and an attorney. My practice is limited to matters affecting the public utility industry.

Q. What is the purpose of your testimony in this case?

A. I have been asked by the Office of Consumer Advocate ("OCA") to review the Applications filed by Transource Pennsylvania LLC ("Transource" or "Company") and provide an expert opinion concerning the regulatory policy issues raised by the Applications. In addition, I have been asked to provide an overall summary of the OCA's recommendations, taking into account the recommendations and conclusions made by OCA experts who have reviewed technical aspects of the Applications.

Q. What are your qualifications to provide this testimony in this case?

A. I have testified as an expert witness before utility commissions or courts in the District of Columbia; the province of Nova Scotia; and the states of Alaska, Arizona, California, Connecticut, Delaware, Illinois, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Mississippi, New Hampshire, New Jersey, New York, North Dakota, Ohio, Pennsylvania, South Carolina, and West Virginia. I also have testified as an expert witness before various federal, state, and local legislative committees. I also have served as a consultant to the staffs of four state utility commissions, as well as to several national utility trade associations, and state and local governments throughout the country. Prior to

1 establishing my own consulting and law practice, I was employed by the OCA from 1983  
2 through January 1994 in increasingly responsible positions. From 1990 until I left state  
3 government, I was one of two senior attorneys at the OCA. Among my other  
4 responsibilities in that position, I had a major role in setting its policy positions on water  
5 and electric matters. In addition, I was responsible for supervising the office's technical  
6 staff. During that time, I also testified as an expert witness for the OCA on rate design  
7 and other policy matters.

8 Throughout my career, I developed substantial expertise in matters relating to the  
9 economic regulation of public utilities. I have published articles, contributed to books,  
10 written speeches, and delivered numerous presentations, on both the national and state  
11 level, relating to regulatory issues. I have attended numerous continuing education  
12 courses involving the utility industry. I also have participated as a faculty member in  
13 utility-related educational programs for the Institute for Public Utilities at Michigan State  
14 University, the American Water Works Association ("AWWA"), and the Pennsylvania  
15 Bar Institute. A copy of my curriculum vitae is attached as Appendix A.

16 Q. Do you have any experience that is particularly relevant to the issues in this case?

17 A. Yes, I do. I have testified on numerous occasions as an expert on numerous types of  
18 public policy issues in utility cases. I also have a strong analytical background, such as  
19 significant coursework in economics, including a graduate course in natural resource  
20 economics that had an emphasis on cost-benefit analysis, as well as conducting numerous  
21 economic and statistical analyses. As an example, earlier this year I testified as an expert  
22 witness before the Nova Scotia Utility and Review Board concerning the costs and  
23 benefits associated with a proposed long-term natural gas pipeline contract. My work in

1 that case included reviewing, replicating, and modifying a statistical simulation model to  
2 estimate the likely costs and benefits of the project under various scenarios and  
3 assumptions, and making policy recommendations to the Board concerning actions that  
4 could enhance the net benefits from the project for consumers. I am also the co-author of  
5 a paper published in the *Journal of Benefit-Cost Analysis*, and I recently served as a peer  
6 reviewer for that journal.

## 7 **Summary**

8 Q. Please introduce the OCA's presentation of expert evidence in these cases.

9 A. The OCA has retained three expert witnesses to review Transource's proposed  
10 Independence Energy Connection Project ("the IEC Project") and offer recommendations,  
11 opinions, and conclusions concerning the need for and siting of the IEC Project. In  
12 addition, I am advised by counsel that the OCA may rely on evidence from other parties  
13 in the case, including testimony and other evidence presented at the public hearings and  
14 site visits. Following is a brief introduction to the OCA's testimony that is being  
15 presented by its expert witnesses:

- 16 • OCA Statement 1 is my direct testimony. I provide an overview of the  
17 IEC Project and the Commission review process. In addition, I review and  
18 critique the benefit-cost analyses prepared by Transource and offer an  
19 opinion concerning the economic need for the IEC Project. I also offer an  
20 opinion, based on my analysis and the expert opinions of OCA's other  
21 witnesses, concerning whether the Commission should grant or deny the  
22 Applications and Petitions filed by the Company.
- 23 • OCA Statement 2 is the direct testimony of Peter Lanzalotta, a power-  
24 systems engineer with more than four decades of experience in the  
25 planning and operation of electric utility systems. Mr. Lanzalotta reviews  
26 the need for the IEC Project, the planning process of PJM Interconnection  
27 LLC ("PJM") that resulted in the selection of the IEC Project, the IEC

1 Project's economics, engineering alternatives to the IEC Project, and  
2 related matters.

3 • OCA Statement 3 is the direct testimony of Geoffrey Crandall, a former  
4 analyst with the Michigan Public Service Commission with more than 40  
5 years of experience in utility planning, energy efficiency, and demand-  
6 response programs. Mr. Crandall reviews non-transmission alternatives to  
7 the IEC Project and evaluates the potential impact on the congestion the  
8 IEC Project attempts to remedy.

9 Q. Please summarize your conclusions and recommendations.

10 A. I summarize my conclusions and recommendations as follows:

11 • Transource's filings in this case do not consider the effects of recent  
12 changes in Pennsylvania law that should affect the Commission's review  
13 and analysis of the proposed projects.

14 • Transource's East and West Applications each identify only one  
15 reasonable alternative route to its selected routes. The route selection  
16 process apparently failed to consider other routes that would be likely to  
17 result in lower cost and lessened environmental impacts.

18 • PJM's so-called "benefit-cost" analysis for non-reliability projects like the  
19 IEC Project does not properly evaluate the benefits of a proposed project.  
20 The analysis completely ignores increases in costs that would be incurred  
21 by zones outside of the region benefiting from a project. That is, the  
22 economic analysis used by PJM and Transource completely ignores the  
23 fact that the lower-cost power that would flow into certain regions is  
24 already being used elsewhere.

25 • While the IEC Project would reduce costs in portions of PJM, the overall  
26 effect on PJM would be that the costs of the IEC Project would greatly  
27 exceed the project's benefits. Indeed, accepting all of Transource's  
28 assumptions shows that every dollar invested in the IEC Project would  
29 produce less than three cents of benefits for PJM.

30 • The effects on Pennsylvania consumers would be even more severe than  
31 the impact on PJM. Over a 15-year period, consumers in Central and  
32 Eastern Pennsylvania would incur increased power costs of more than  
33 \$340 million while consumers in Western Pennsylvania would receive  
34 lower-cost electricity valued at only \$2 million.

35 • I conclude, therefore, that Transource has failed to demonstrate that there  
36 is an economic need for the IEC Project. In fact, PJM in general and

1 Pennsylvania consumers in particular would save millions of dollars each  
2 year if the IEC Project is not built.

3 Q. Considering your conclusions and recommendations along with the conclusions and  
4 recommendations of the OCA's other expert witnesses, what is your ultimate  
5 recommendation to the Commission?

6 A. The OCA's other expert witnesses conclude that the IEC Project is not needed to provide  
7 safe and reliable service to the public. Transource has failed to demonstrate a need for  
8 the IEC Project from either an economic or engineering perspective. If there is a need to  
9 address economic congestion or to lower the cost of electricity in Maryland, District of  
10 Columbia, and Virginia, there are much more cost-effective means to do so, such as  
11 through the use of existing transmission rights-of-way and through the enhanced use of  
12 distributed generation and energy efficiency projects.

13 When all facts are considered, construction and operation of the IEC Project  
14 would result in significant net harm to the Commonwealth, its residents, and its  
15 electricity consumers. I conclude, therefore, that the IEC Project is not necessary or  
16 proper for the service, accommodation, safety, or convenience of the public. In my  
17 opinion, therefore, the IEC Project does not meet the requirements of Pennsylvania's law  
18 and regulations for (1) siting a high-voltage transmission line, (2) over-riding municipal  
19 requirements for building construction, or (3) using the power of eminent domain.

20 Q. Do you have any other preliminary matters to address?

21 A. Yes. A portion of my testimony deals with regulatory policy issues. Given the nature of  
22 public utility regulation, much of the public policy in this field is contained in decisions  
23 by regulatory agencies and courts; or in statutes, ordinances, or regulations. I will be

1 citing to these types of sources. This should not be taken as a legal opinion (though I am  
2 qualified to provide expert testimony as a regulatory attorney in Pennsylvania), but rather  
3 as sources supporting my expert opinion concerning appropriate public policy and  
4 regulatory practice.

### 5 **Overview of the PJM Planning Process**

6 Q. What type of project is the IEC Project, according to PJM's planning process?

7 A. The IEC Project is a "market efficiency" project. This means that the project is not being  
8 proposed to enhance the reliability of service; nor does it solve any existing reliability  
9 concerns. Rather, market efficiency projects are proposed to provide an economic  
10 benefit to some PJM member utilities; that is, to reduce bulk power costs.

11 Q. Please describe your general understanding of the PJM planning process for a market  
12 efficiency project like the IEC Project.

13 A. PJM conducts a process to identify transmission projects that might enhance the  
14 economic efficiency of the bulk power market. The market efficiency selection process  
15 is based on project-specific analyses performed as part of PJM's Regional Transmission  
16 Expansion Plan ("RTEP") process.

17 PJM describes the market efficiency portion of the RTEP process as follows:

18 PJM's Regional Transmission Expansion Plan (RTEP) Process includes a  
19 market efficiency analysis, the goal of which is to accomplish the  
20 following objectives:

21 1. Determine which reliability-based enhancements have economic  
22 benefit if accelerated.

23 2. Identify new transmission enhancements that may realize  
24 economic benefit.



1 3. Identify economic benefits associated with modification to  
2 reliability-based enhancements already included in RTEP that  
3 when modified would relieve one or more economic constraints.  
4 Such enhancements, originally identified to resolve reliability  
5 criteria violations, may be designed in a more robust manner to  
6 provide economic benefits as well.

7 Economic benefits of proposed transmission projects can be created by  
8 mitigating congestion within production cost simulations of PJM’s  
9 transmission and generation dispatch systems. The benefit metrics are  
10 determined by comparing future year simulation results of PJM’s system,  
11 both without and with the proposed transmission enhancement. The set of  
12 metrics utilized and the methods involved with benefit determination are  
13 further described in Manual 14B Section 2.6 and Schedule 6 Section 1.5.7  
14 of the PJM Operating Agreement.

15 Interaction between PJM staff and PJM membership concerning Market  
16 Efficiency Analysis is accomplished through the Transmission Expansion  
17 Advisory Committee (TEAC). It is within the TEAC charter that the  
18 committee will provide comments and recommendations concerning the  
19 assumptions, scope, and analysis of results to PJM staff and where  
20 appropriate to the PJM Board. The PJM Board will consider market  
21 efficiency study assumptions and approve proposed transmission projects  
22 and cost responsibility that is derived from a recommended project.<sup>1</sup>

23 Q. How does PJM evaluate a proposed “market efficiency” project?

24 A. According to PJM’s training materials for market efficiency projects,<sup>2</sup> the evaluation  
25 process differs depending on the voltage level of the proposed project. If the voltage  
26 level is 500,000 volts (500 kV) or higher, the project is considered a “regional” project.  
27 Regional projects are evaluated based on an average of (a) the savings in energy costs  
28 (known as the Net Load Payment, or NLP) in the zones that would see reduced costs and  
29 (b) production cost savings throughout PJM.

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<sup>1</sup> PJM, PJM Market Efficiency Modeling Practices (Feb. 2, 2017), available at:  
<https://www.pjm.com/~media/planning/rtep-dev/market-efficiency/pjm-market-efficiency-modeling-practices.ashx>,  
last accessed Sept. 10, 2018.

<sup>2</sup> PJM, Market Efficiency Study Process and Project Evaluation Training (Dec. 22, 2014), available at:  
<https://www.pjm.com/~media/committees-groups/committees/teac/20140417-market/20140417-2014-market-efficiency-training.ashx>, last accessed Sept. 10, 2018.

1           Projects with voltage levels less than 500 kV, such as the IEC Project, have their  
2           benefits evaluated solely based on the NLP savings in zones that would see reduced  
3           energy costs.

4           The savings are estimated for each zone within PJM for a 15-year period  
5           beginning with the in-service date of the proposed project, which is usually four years  
6           into the future. Detailed production cost simulations are prepared for four years: (1) four  
7           years prior to the first year in service (known as the RTEP year) which is the base case  
8           (current) condition; (2) the RTEP year, (3) RTEP year plus 3, and (4) RTEP year plus 6.  
9           The estimated savings for each of the other 12 years is interpolated from the results of the  
10          three future-year simulations (RTEP, RTEP+3 and RTEP+6).

11 Q.      Can you provide an example?

12 A.      Yes. The PJM training materials I cited above give an example with an RTEP year (that  
13          is, a project in-service date) of 2019. The study period is 15 years from the in-service  
14          (RTEP) date. In this example, the analysis would cover the period from 2019 to 2033. In  
15          that example, the four simulations would be for 2015 (RTEP-4), 2019 (RTEP), 2022  
16          (RTEP+3), and 2025 (RTEP+6). The remaining years would be estimated using a simple  
17          linear trend. For example, if the savings from the 2019 model run is \$100 and the  
18          savings from the 2022 run is \$190, then the estimates for 2020 and 2021 would be \$130  
19          and \$160, respectively.

20 Q.      How are the results for each year used in determining the overall benefits from a project?

21 A.      The change in NLP (which I abbreviate  $\Delta$ NLP, delta ( $\Delta$ ) being the mathematical symbol  
22          for change) for each zone is calculated for each of the 15 years. Those annual values for

1 each zone are then discounted to a present value as of the RTEP year. In the example  
2 above, the net present value would be expressed as of 2019. PJM determines the  
3 discount rate to be used based on the weighted average cost of capital of all PJM  
4 transmission owners. The rate changes over time. For example, in 2014 the discount rate  
5 was 7.8%. In the 2017 planning cycle (RTEP year 2021), the discount rate was 7.4%.<sup>3</sup>

6 Q. What does the discount rate mean?

7 A. The discount rate is designed to answer a question like: How much would you give me  
8 today if I promised to give you \$100 one year from now (or two years from now, etc.)?  
9 The discount rate is a measure of the time-value of money.

10 Using the above examples for the 2015 planning process (RTEP year 2019), if the  
11 savings in 2019, 2020, and 2021 were \$100, \$130, and \$160, a discount rate allows us to  
12 estimate how much that is worth in 2019. The 2019 savings (\$100) would not be  
13 discounted at all. The savings of \$130 in 2020, however, would be worth 7.8% less  
14 (using PJM's 2014 discount rate) in 2019, or \$119.86. (In effect, you would be willing to  
15 pay \$119.86 today for the promise of \$130 a year from now.) And the savings two years  
16 away, in 2021, would be worth 7.8% each year, or \$136.01.<sup>4</sup> The further removed you  
17 are from the first year, the less you would pay for the promise of a future benefit. For  
18 example, at a 7.8% discount rate, a promise of \$100 in 10 years is worth only about \$44  
19 today.

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<sup>3</sup> PJM, 2017 RTEP Process Scope and Input Assumptions (Aug. 3, 2017), available at: <https://www.pjm.com/-/media/library/reports-notices/2017-rtep/20170731-rtep-input-assumptions-and-scope-whitepaper.ashx?la=en>, last accessed Sept. 10, 2018.

<sup>4</sup>  $\$160 \times (1 - 0.078) \times (1 - 0.078) = \$136.01$ .

1 Q. How does PJM’s analysis use the discounted change in NLP for each zone?

2 A. If a zone has a positive  $\Delta$ NLP – that is, its power costs increase over the 15-year study  
3 period – the zone is dropped from the calculation. Only zones whose discounted sum of  
4  $\Delta$ NLP is negative – that is, power costs decreased over the 15-year period – are included  
5 in the benefits calculation.

6 Q. Can you provide an example?

7 A. For this example, I will assume a very simplified system with only three zones. The 15-  
8 year NPV of  $\Delta$ NLP shows the following: Zone 1 has a benefit (lower  $\Delta$ NLP) of \$100;  
9 Zone 2 has a benefit of \$50; and Zone 3 has a detriment (higher  $\Delta$ NLP) of -\$110. Overall  
10 the three zones experience net savings of \$40 (\$100 + \$50 - \$110). For purposes of  
11 PJM’s analysis, however, Zone 3 would be dropped from the calculation and the project  
12 would have a “benefit” of \$150.

13 Q. How is the cost side of the benefit-cost analysis determined?

14 A. PJM’s RTEP process determines the cost of a project based on the carrying charge for the  
15 capital cost of the project, discounted over 15 years. The carrying charge calculation  
16 assumes a project has a 45-year life (so a depreciation rate of slightly more than 2% per  
17 year) and a cost of capital (including taxes) based on the weighted average of PJM  
18 transmission owners’ cost of capital.<sup>5</sup> For example, in 2014 the carrying cost rate was  
19 16.2%; by 2017 it had declined to 15.3%. The annual carrying cost is calculated and then  
20 discounted for 15 years using the same discount rate that is used for determining the NPV

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<sup>5</sup> PJM, 2017 RTEP Process Scope and Input Assumptions (Aug. 3, 2017), available at: <https://www.pjm.com/-/media/library/reports-notices/2017-rtep/20170731-rtep-input-assumptions-and-scope-whitepaper.ashx?la=en>, last accessed Sept. 10, 2018.

1 of project benefits. The result is a present value of revenue requirements (“PVRR”) for  
2 the first 15 years.

3 Q. Can you provide an example?

4 A. Yes. Assume a project has a construction cost of \$100, the carrying charge rate is 16.2%,  
5 and the discount rate is 7.8%. That would mean that the annual cost of the project is  
6 \$16.20. The value of that in the first year is \$16.20. The second year’s carrying cost of  
7 \$16.20 would be worth only \$14.94 ( $\$16.20 \times (1 - 0.078)$ ). The third year’s cost would  
8 be worth only \$13.77 in the first year, and so on. The sum of those discounted annual  
9 carrying charges for 15 years would be the PVRR of the project in the year the project  
10 goes into service.

11 Q. How is the benefit-cost ratio for a project determined by PJM?

12 A. The benefit-cost ratio is the discounted benefit (NPV of  $\Delta$ NLP for 15 years) divided by  
13 the discounted cost (PVRR calculated over 15 years).

14 Q. Does PJM have a minimum benefit-cost threshold that a project must meet?

15 A. Yes. PJM requires a project to have a benefit-cost ratio of at least 1.25 in order to be  
16 selected for construction. Remember, though, that the calculation excludes consideration  
17 of all zones where the project would cause a detriment (an increase in power costs), as I  
18 discuss in more detail later in my testimony.

19 Q. Once a project is selected by PJM, is the project re-evaluated?

20 A. Yes. PJM conducts a periodic re-evaluation of selected projects to ensure that they  
21 remain cost-effective.

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## 1           **Pennsylvania’s High-Voltage Transmission Review Process**

2   Q.     Are you generally familiar with the process in Pennsylvania for Commission review of a  
3           new high-voltage transmission line and substation?

4   A.     Yes. I am familiar with some of the statutes, Commission regulations, and Commission  
5           policy statements addressing the siting of high-voltage transmission lines and substations.

6           In particular, I am familiar with the following:

- 7           • 66 Pa. C.S. § 1501 that gives the Commission authority to review a  
8           utility’s facilities and determine whether changes are needed to provide  
9           safe, adequate, and reliable service to the public;
- 10          • 15 Pa. C.S. § 1511 that gives public utilities the power of eminent domain  
11          if the Commission finds that the proposed taking is needed for the service,  
12          accommodation, convenience, or safety of the public;
- 13          • 53 P.S. § 10619 that gives the Commission the authority to override local  
14          zoning and land-use requirements for the construction of buildings needed  
15          for the provision of utility service;
- 16          • 52 Pa. Code §§ 57.71 to 57.77, the Commission’s regulations for high-  
17          voltage power line siting applications;
- 18          • 52 Pa. Code § 69.1101, the Commission’s policy statement concerning the  
19          effect of its decisions on local zoning and land-use planning requirements;  
20          and
- 21          • 52 Pa. Code §§ 69.3101-69.3107, the Commission’s policy statement  
22          concerning additional information and coordination for transmission line  
23          siting applications.

24   Q.     What is your general understanding of the Commission’s review process?

25   A.     Very generally, the Commission seeks to determine whether a high-voltage transmission  
26           line is needed to serve the public given the available alternatives, that the route selected  
27           for the line is reasonable, and that the utility has minimized environmental and societal  
28           harm from the project. The Commission also will seek to minimize any incursion into  
29           local zoning and land-use requirements from substation buildings. The Commission also

1 will require certain set-backs from residences and other protected properties. Finally, the  
2 Commission attempts to meet these responsibilities in a process that is open to the  
3 affected public, including landowners, utility customers, other utilities, and local  
4 governments.

## 5 **Effect of Recent Pennsylvania Legal Actions on the Review Process**

6 Q. Are there any recent legal actions in Pennsylvania that are not yet reflected in the  
7 Commission's regulations and policy statements?

8 A. Yes, in my opinion there are two recent legal actions in Pennsylvania that are not yet  
9 reflected in the Commission's regulations and policy statements: (1) the Pennsylvania  
10 Supreme Court's decision in *Pennsylvania Environmental Defense Foundation v.*  
11 *Commonwealth*<sup>6</sup> ("PEDF") on June 20, 2017, and (2) Act 45 of 2018 signed by  
12 Governor Wolf on June 24, 2018, and effective immediately.

13 Q. As a matter of public policy, and not as a legal opinion, why do you think the *PEDF* case  
14 affects the Commission's review of high-voltage transmission lines and related facilities?

15 A. The Commission's siting regulations initially were put in place to implement the  
16 Commonwealth Court's decision in *Payne v. Kassab* and some related cases that applied  
17 the same standard specifically to the Commission. Very briefly, those decisions allowed  
18 Commonwealth agencies, including the Commission, to take actions that could affect the  
19 natural environment so long as the agencies ensured that environmental effects were  
20 mitigated to the extent practical, given the nature of the project.

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<sup>6</sup> 161 A.3d 911 (2017).

1           The Supreme Court’s *PEDF* decision expressly overturns *Payne v. Kassab* and  
2           establishes a new test. As I understand it, the Court rejected any type of balancing or  
3           mitigation analysis, and instead requires the Commonwealth to fulfill its obligations  
4           under the Constitution as a “trustee” of natural resources. Specifically, the Court stated:  
5           “[T]he Commonwealth has a duty to prohibit the degradation, diminution, and depletion  
6           of our public natural resources, whether these harms might result from direct state action  
7           or from the actions of private parties.” *PEDF* at 933 (citation omitted).

8           In my opinion, this duty of protection goes beyond the balancing test and  
9           mitigation analysis that were contained in the now-rejected *Payne v. Kassab* test that was  
10          the basis for the Commission’s siting regulations. Many transmission line projects,  
11          including this one, involve the potential to degrade “public natural resources” (such as  
12          waterways and public lands) and it appears to me that the Court is stating that the Pa.  
13          Constitution requires the Commission to only permit degradation of those resources when  
14          there is no reasonable alternative.

15   Q.    What is Act 45 and how might it affect transmission line siting cases?

16   A.    Act 45 amends the Eminent Domain Code to provide special protection to land that is  
17          subject to agricultural conservation easements. These are properties where the owners  
18          have taken specific legal action to limit the use of the property to agricultural production,  
19          specifically agreeing to forego development of the property. These types of properties  
20          include a payment from a county or the Commonwealth to partially compensate the  
21          owner for the value lost by foregoing development of agricultural property.



1           As I understand it, Act 45 requires a special procedure if a local government or  
2 public utility attempts to take a portion of preserved property by eminent domain.  
3 Briefly, for public utilities to take preserved property, the new law requires this  
4 Commission to “review and ratify” “the necessity for ... and environmental effects of”  
5 the proposed use of the property. Section 2 of the Act, adding section 208 to the Eminent  
6 Domain Code.

7           I am not certain, but I believe this may be the only instance where the  
8 Commission is specifically required by law to review the environmental effects of  
9 proposed utility facilities.

10 Q. Do you know what “environmental effects” are under Act 45?

11 A. It appears to me that the term “environmental effects” refers to the definition of “open  
12 space benefits” in the Act, which are defined to include the following:

13           (1) the protection and conservation of water resources and watersheds, by  
14 appropriate means, including, but not limited to, preserving the natural  
15 cover, preventing floods and soil erosion, protecting water quality and  
16 replenishing surface and ground water supplies;

17           (2) the protection and conservation of forests and land being used to  
18 produce timber crops;

19           (3) the protection and conservation of farmland;

20           (4) the protection of existing or planned park, recreation or conservation  
21 sites;

22           (5) the protection and conservation of natural or scenic resources,  
23 including, but not limited to, soils, beaches, streams, flood plains, steep  
24 slopes or marshes;

25           (6) the protection of scenic areas for public visual enjoyment from public  
26 rights of way;

27           (7) the preservation of sites of historic, geologic or botanic interest; and

1 (8) the promotion of sound, cohesive and efficient land development by  
2 preserving open spaces between communities.

3  
4 **High-Level Review of Transource's Application**

5 Q. Have you reviewed Transource's Applications and substation Petitions?

6 A. Yes, I have reviewed the Applications and Petitions, as well as many of the attachments  
7 and accompanying testimony.

8 Q. From your review, does Transource address the effect of the *PEDF* decision on the siting  
9 of the transmission lines and substations?

10 A. No. Transource's filings appear to proceed as if the *PEDF* decision did not exist, or at  
11 least that it did not change anything in the Commission's review process. Transource  
12 made its initial filings in this case on December 27, 2017, which was six months after the  
13 Supreme Court's decision was issued.

14 Q. From your review and understanding of this case, has Transource addressed the effect of  
15 Act 45 on these dockets?

16 A. No. Act 45 became effective on June 24, 2018, about six months after Transource filed  
17 its initial Applications, so it could not have addressed Act 45 in its initial filings.

18 Q. From your review of Transource's Applications, did it fully comply with the  
19 Commission's existing regulations for high-voltage transmission line applications?

20 A. From my review, there appears to be a significant deficiency in Transource's  
21 Applications. Specifically, the Commission's regulation at 52 Pa. Code § 57.72(c)(10)  
22 requires an application to contain "a general description of reasonable alternative routes

1 to the proposed HV line, including a description of the corridor planning methodology, a  
2 comparison of the merits and detriments of each route, and a statement of the reasons for  
3 selecting the proposed HV line route.” From my review, the Applications do not contain  
4 the required information for “reasonable alternative routes.”

5 Q. Why do you reach that conclusion?

6 A. I reach that conclusion for two reasons. First, the Commission’s regulations define an  
7 “alternative route” as “a reasonable right-of-way which includes not more than 25% of  
8 the right-of-way of the applicant’s proposed route.” 52 Pa. Code § 57.1. The Transource  
9 East Application has three so-called alternative routes, labeled D, E, and F, with E being  
10 the chosen route. There is, however, significant overlap between Routes E and F. Route  
11 E is 15.8 miles long and I estimate (from the route descriptions and map on pages 21-26  
12 of the Siting Study) that Routes E and F have approximately 5.9 miles in common, or  
13 about a 37% overlap. Thus, Route F would not qualify as an “alternative route” under the  
14 Commission’s requirements. In effect, then, the Company presents only two route  
15 options in its East Application.

16 Similarly, the Transource West Application identifies three so-called alternate  
17 routes: A, B, and C, with C being the selected route. There is a significant overlap  
18 between Routes B and C. Route C is 28.8 miles long and I estimate (from the route  
19 descriptions and map on pages 22-29 of the West Siting Study) that Routes B and C have  
20 approximately 16.5 miles in common, or about a 57% overlap. Thus, Route B does not  
21 qualify as an “alternative route” under the regulations. As was true in its East  
22 Application, the Company’s West Application presents only two route options.

1 Q. What is the second reason you conclude the Company did not identify reasonable  
2 alternative routes?

3 A. The Company did not adequately evaluate project paths that include the use of existing  
4 transmission rights-of-way and/or existing infrastructure. I note that the Commission's  
5 Policy Statement requires applicants to consider "relevant existing rights of way" for  
6 each alternative route. 52 Pa. Code § 69.3105(3)(iii). Mr. Lanzalotta discusses this issue  
7 in his direct testimony where he concludes that such paths would be reasonable and  
8 would be likely to result in lower costs and much less significant environmental harm  
9 than the selected routes.

### 10 **Overview of the IEC Project**

11 Q. Please describe your understanding of the project proposed in the Applications.

12 A. In general terms, the IEC Project is designed to enhance the economical flow of power  
13 within a portion of the PJM Interconnection, the network for the transmission of  
14 electricity at high voltages in a multistate region. In particular, the IEC Project is not  
15 proposed to address any reliability concerns. Rather, the IEC Project is designed to  
16 relieve economic congestion in portions of Maryland, the District of Columbia, and  
17 Virginia ("MD-DC-VA"), so that power can flow into the region more frequently from  
18 other parts of PJM including central and eastern Pennsylvania.

19 Q. Before you continue with your understanding of the IEC Project, what do you mean by  
20 "enhancing the economical flow of power" and "relieving economic congestion"?

21 A. As Mr. Lanzalotta describes in more detail, these terms indicate that the IEC Project is  
22 not needed to enhance the reliability of electricity service. Rather, the IEC Project is

1 being undertaken solely to reduce the cost of electricity flowing into the affected area.  
2 Stated differently, there is no reliability concern with the supply of electricity to the  
3 region; but the transmission grid can be made more efficient to reduce the cost of the  
4 power that flows into certain parts of the region.

5 To over-simplify a bit, the IEC Project will lessen the alleged electrical barriers  
6 (congestion) and enable lower-cost electricity to reach the higher cost areas of MD-DC-  
7 VA. To be clear, MD-DC-VA have plenty of power, so the IEC Project has no reliability  
8 benefit; but costs to those areas can be reduced if additional power can be imported cost-  
9 effectively from lower-cost areas.

10 Q. Do you have an understanding of the physical construction that will be necessary to  
11 complete the IEC Project?

12 A. My knowledge of the physical and engineering aspects of the IEC Project is limited to  
13 what I have read in the Company's Applications. I understand generally that it involves  
14 the construction by Transource of two new substations and approximately 45 miles of  
15 double-circuit, 230,000-volt transmission lines and supporting structures. Both  
16 substations and approximately 37 miles of the transmission line are to be located in  
17 Pennsylvania. In addition, PECO and MAIT would be required to upgrade certain  
18 portions of their Pennsylvania transmission networks. Any details concerning the  
19 construction or configuration of the IEC Project will be addressed by Mr. Lanzalotta.

1 Q. Do you have an understanding of the economic costs and benefits from the IEC Project,  
2 as claimed by the Company?

3 A. Yes. When a version of the IEC Project was originally proposed in February 2015,  
4 Transource estimated the construction cost to be \$269 million, resulting in a 15-year  
5 estimated present value of revenue requirements (“PVRR”) of \$391.8 million. At that  
6 time, Transource estimated the IEC Project’s benefits over the first 15 years to be  
7 \$2,768.2 million, for a benefit-cost ratio in excess of 7.0.<sup>7</sup>

8 By the time the project was refined and selected by PJM in September 2016, the  
9 IEC Project’s capital cost had increased to \$340.6 million, resulting in a PVRR of \$478  
10 million. The Project’s benefits (the savings in energy payments) had declined to  
11 approximately \$1,188 million.<sup>8</sup> When all factors were considered, the IEC Project’s 15-  
12 year benefit-cost ratio had declined to 2.5.<sup>9</sup>

13 In September 2017, the TEAC reviewed a re-evaluation of the economics of the  
14 IEC Project. The total construction cost was not re-estimated at that time, so it remained  
15 at \$340.6 million, though the PVRR factors changed slightly resulting in a 15-year PVRR  
16 of \$462.7 million. The Project’s benefits, however, had declined to only \$611.48 million  
17 over 15 years, resulting in the IEC Project having a claimed benefit-cost ratio of only

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<sup>7</sup> Project proposal, public version available at: <https://www.pjm.com/-/media/planning/rtep-dev/expansion-plan-process/ferc-order-1000/rtep-proposal-windows/redacted-public-proposals/201415-1-9a-dominion-high-voltage-transource-public-redacted-version-southern-pa.ashx?la=en>; confidential version provided as Attachment to OCA XI-1 (all figures cited are public).

<sup>8</sup> See PJM Transmission Expansion Advisory Committee (“TEAC”) Recommendations to the PJM Board (Aug. 2016), available at: <https://www.pjm.com/-/media/committees-groups/committees/teac/20160811/20160811-board-whitepaper-august-2016.ashx>; attachment to OCA II-14; and OCA II-16.

<sup>9</sup> See PJM TEAC Market Efficiency Update (Sept. 14, 2017), available at: <https://www.pjm.com/-/media/committees-groups/committees/teac/20170914/20170914-market-efficiency-update.ashx>.

1           1.3.<sup>10</sup> As stated above, PJM has a minimum requirement of a benefit-cost ratio of 1.25,  
2           so the IEC Project minimally passed PJM's test in September 2017.

3                   On September 13, 2018, the PJM TEAC again re-evaluated the IEC Project. Its  
4           latest findings are that the project's capital costs have increased to \$366.17 million  
5           resulting in a 15-year PVRR of \$498 million and the IEC Project's benefits have  
6           increased to \$707.3 million, for a benefit-cost ratio of 1.42.<sup>11</sup>

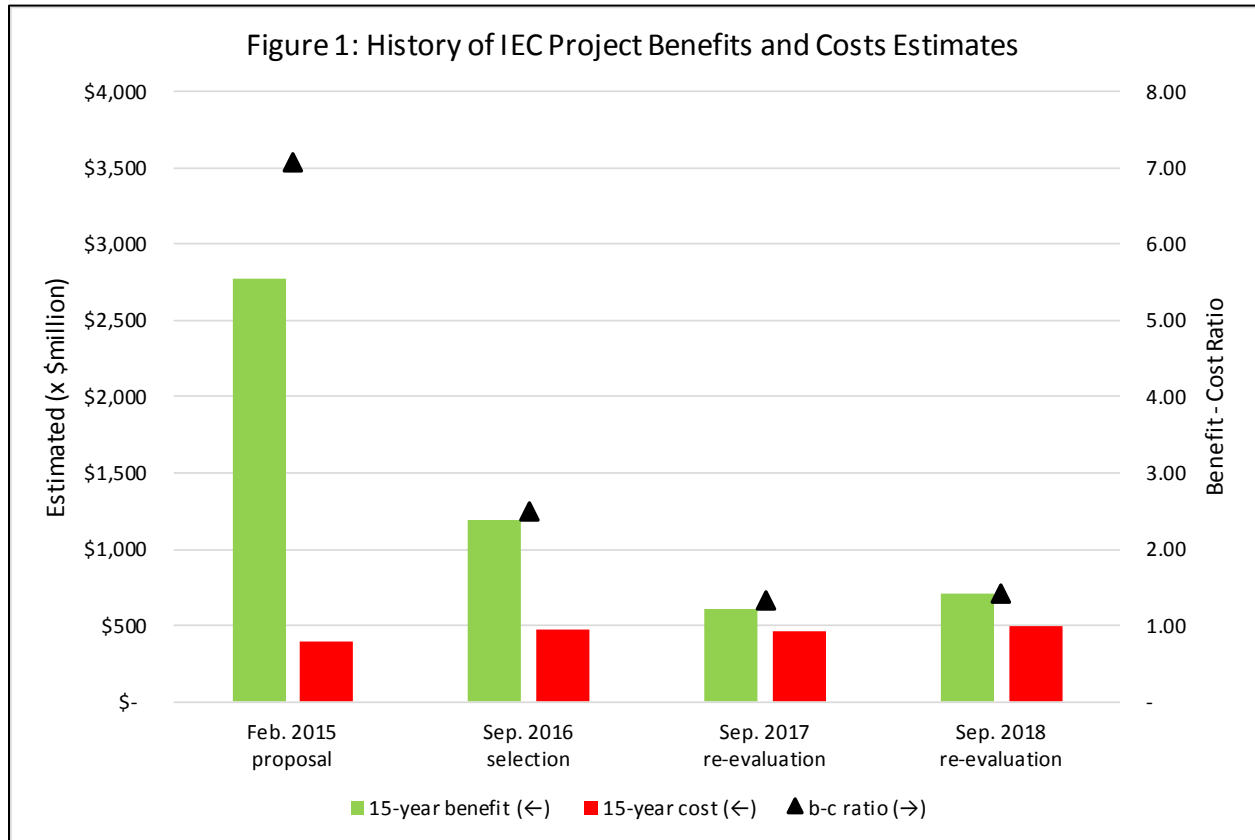
7                   Figure 1 summarizes the history of increasing costs and declining benefits for the  
8           IEC Project.

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<sup>10</sup> See *id.*, and attachment to OCA VI-2.

<sup>11</sup> PJM TEAC Transource AP-South (2014/15\_9A) Project Reevaluation (Sept. 13, 2018), available at: <https://www.pjm.com/-/media/committees-groups/committees/teac/20180913/20180913-ap-south-9a-project-reevaluation-sept-2018.ashx>.

1



2

3 Q. Are either the costs or benefits from the IEC Project certain?

4 A. No. Transource has not proposed, and PJM has not required, any type of cost cap or  
 5 limiter for the project. Moreover, as I summarized above, the benefits from the IEC  
 6 Project are far from certain. As Mr. Lanzalotta and Mr. Crandall discuss, other  
 7 transmission projects, generation changes (such as plant retirements and the installation  
 8 of distributed generation), and demand-side management programs can dramatically  
 9 change the benefits from the project.



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## Benefit-Cost Analysis of the IEC Project as a Whole

1 Q. What is the purpose of conducting a benefit-cost analysis?

2 A. The purpose of a benefit-cost analysis is to attempt to capture the likely consequences of  
3 an activity, and to express those consequences in the same units (dollars, in this case) so  
4 that they can be compared.  
5

6 In about 1980, I took a graduate course in natural resource economics and we  
7 spent a good deal of time analyzing benefit-cost analyses. I still have one of the texts I  
8 purchased at that time: *Cost-Benefit Analysis* by E.J. Mishan, (the second edition  
9 published in 1976). In the introduction to that book, Professor Mishan, then a professor  
10 at the London School of Economics, provides an excellent definition of cost-benefit  
11 analysis, as follows:

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

25 *Id.*, p. x.<sup>12</sup>

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<sup>12</sup> The text is now in its fifth edition, published in 2007. Essentially the identical paragraph appears on pages 3-4 of the fifth edition, with an added clarification that a cost-benefit analysis may be limited to a specific region or portion of the economy.

1           In other words, it is important to capture not only the specific benefits and costs to  
2           those undertaking the project, but also the benefits and costs to those who might be  
3           directly or indirectly affected by the project.

4   Q.     Does the so-called benefit-cost methodology required by PJM and used by Transource  
5           meet the requirements of a benefit-cost analysis?

6   A.     No. The PJM methodology used by Transource fails to capture all of the benefits and  
7           costs associated with the IEC Project.

8   Q.     How did you reach that conclusion?

9   A.     I reached that conclusion by reviewing the electronic spreadsheet model used by  
10          Transource to estimate the costs and benefits of the IEC Project, provided in response to  
11          OCA VI-2, as well as the Company's answers to other interrogatories. As I explain in  
12          more detail below, reviewing that information leaves no doubt that the PJM methodology  
13          ignores the negative consequences to utilities (and their customers) outside the region to  
14          be benefited. That is, when calculating the benefits of the IEC Project, Transource  
15          calculated the reduced power costs (primarily in MD-DC-VA) from being able to import  
16          lower-cost power into that region; but it failed to subtract from those benefits the higher  
17          costs that would result in other regions (including Pennsylvania) because they would no  
18          longer have the benefit of that same lower-cost power.

19   Q.     Is it possible from the PJM methodology used by Transource to determine the increased  
20          costs in the non-benefiting regions?

21   A.     Yes. The spreadsheet model includes a calculation of the net benefit or cost for each  
22          control area within PJM. Incredibly, though, when it comes time to determine a project's

1 “benefits” only those regions that would experience reduced costs are included in the  
2 calculation. All regions whose costs would increase as a result of a project are simply  
3 ignored.

4 Q. Can you be more specific about the impact of this approach for the IEC Project?

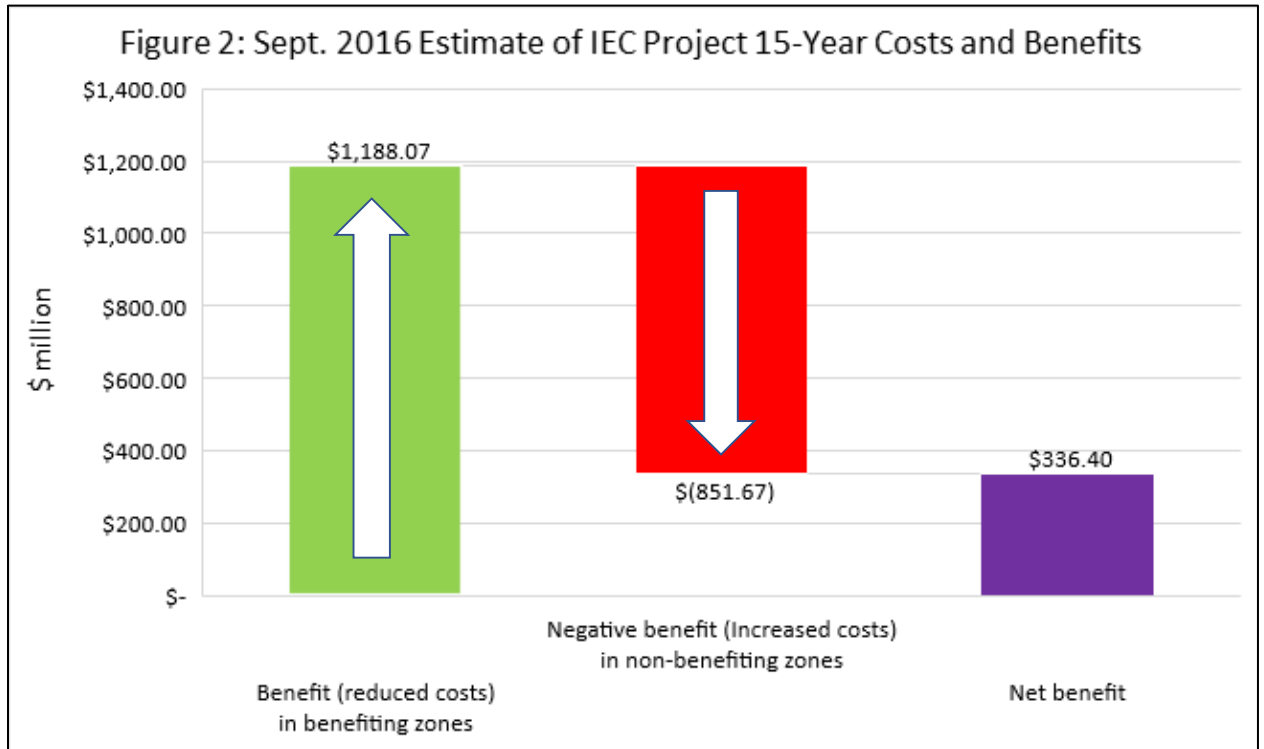
5 A. When PJM first reviewed the IEC Project, it found Project benefits of \$1,188 million, as  
6 shown on the attachment to OCA II-14 (attached as Schedule SJR-1). This represents the  
7 present value of 15 years of savings in Net Load Payments (“NLP”) (that is, energy  
8 costs). The Schedule shows, however, that this figure completely ignores the zones  
9 where energy costs would increase as a result of the IEC Project.

10 Q. Please explain the information shown in Schedule SJR-1.

11 A. In the table provided by Transource, a positive number represents an increase in power  
12 costs (that is a net cost or detriment from the IEC Project) and a negative number  
13 represents lower power costs from the IEC Project (a net benefit). Take the first row as  
14 an example. AECO is the Atlantic Electric zone within PJM (the greater Atlantic City,  
15 NJ, area). This shows that over the first 15 years with the IEC Project in service, power  
16 costs would increase by \$33.55 million for Atlantic City area customers if the IEC  
17 Project is completed. Simply, this means that AECO currently is able to use slightly  
18 more of the lower-cost power than is economically optimal because of constraints that  
19 keep some of that power from flowing into MD-DC-VA.

20 The Company’s presentation in 2016 made it appear that the IEC Project would  
21 lower the cost of energy delivery within PJM by more than \$1 billion over a 15-year  
22 period. In fact, though, the increase in efficiency would be just \$336 million over that

1 period when accounting for the rising costs in other PJM transmission zones as a result of  
 2 the IEC Project. I illustrate this, using the data from Schedule SJR-1, in Figure 2, below.



3

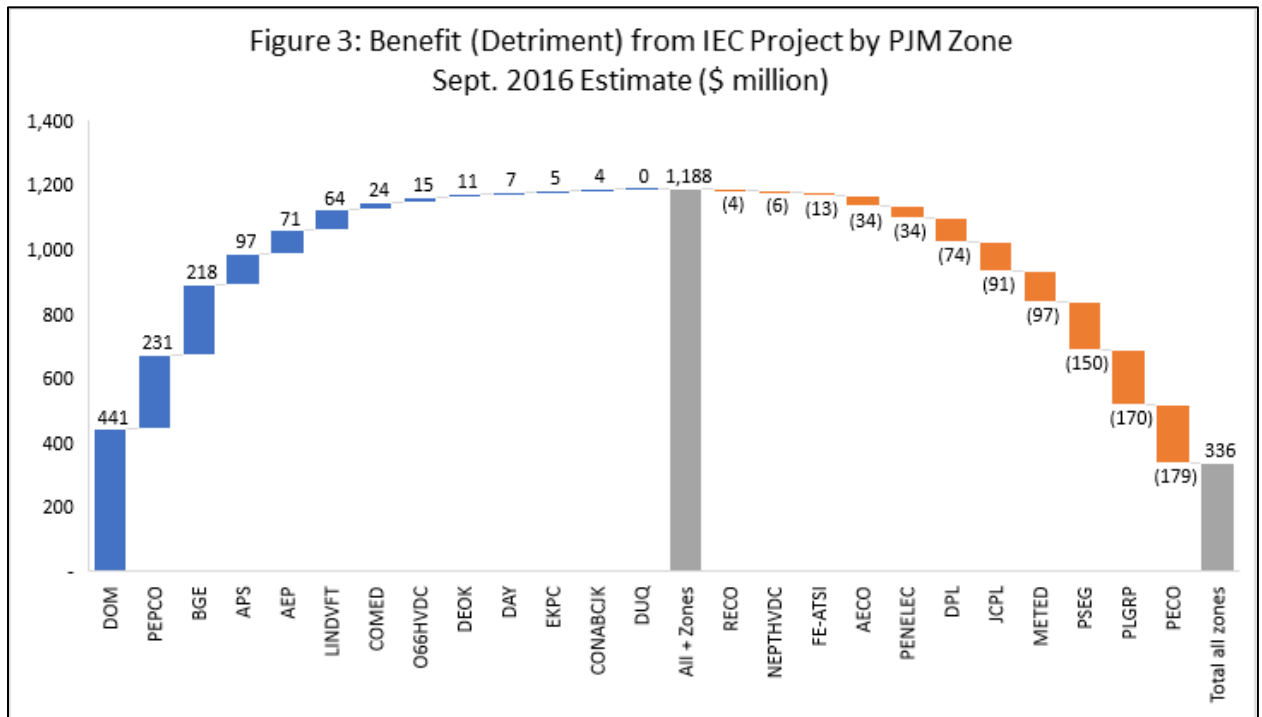
4 Q. Why is it important to include the net efficiency gains of the IEC Project in a benefit-cost  
 5 analysis?

6 A. The net efficiency gains are the only true measure of the IEC Project's benefit. The  
 7 approach used by the Company assumes that the lower-cost power that flows into MD-  
 8 DC-VA would not otherwise confer any economic benefit but for the construction of the  
 9 IEC Project. In reality, though, that lower-cost power is being used in other regions of  
 10 PJM (primarily Pennsylvania and New Jersey).

1 Thus, the benefits from the IEC Project should be measured as the reduction in  
 2 power costs in MD-DC-VA, offset by the increase in power costs in regions like parts of  
 3 Pennsylvania where power costs will increase.

4 Q. How are the benefits and detriments from the IEC Project distributed among the PJM  
 5 zones?

6 A. Figure 3 illustrates the distribution of benefits and detriments, by zone, from the IEC  
 7 Project. This figure uses the data from the September 2016 estimate that is summarized  
 8 in Schedule SJR-1, sorted from the zone with the greatest benefit (Dominion) to the zone  
 9 with the greatest detriment (PECO).



10  
11

12 Figure 3 shows that four zones (Dominion, PEPCO, and BG&E in parts of MD-  
 13 DC-VA, and Allegheny Power System (APS) in parts of Pennsylvania, West Virginia,  
 14 Maryland, and Virginia) would receive more than \$980 million in benefits from the IEC

1 Project. The remaining \$200 million in benefits would be spread among nine other  
2 zones. The detriments from the IEC Project are primarily incurred by five zones (PECO  
3 in Pennsylvania, the combined PPL-UGI zone (PLGRP) in Pennsylvania, Public Service  
4 Electric & Gas in New Jersey, Met Ed in Pennsylvania, and Jersey Central Power &  
5 Light in New Jersey) whose losses would total more than \$680 million if the IEC Project  
6 were completed. The remaining six zones would experience losses totaling \$165 million.

7 Q. Using data from the September 2016 study, do you dispute that the IEC Project would  
8 help to alleviate some economic inefficiencies in the regional power grid?

9 A. No. The information in Schedule SJR-1 and Figures 2 and 3 show that, as of the 2016  
10 analysis, the IEC Project would produce benefits totaling \$336 million over 15 years, or  
11 approximately \$21 million per year. My dispute is with the Company's focus solely on  
12 the zones that benefit from the IEC Project, while ignoring the zones that would incur  
13 higher costs from the IEC Project.

14 Q. Have the data in Schedule SJR-1 and Figures 2 and 3 been updated by Transource?

15 A. Yes, there have been two updates. In response to OCA VI-2, Transource provided an  
16 updated benefit-cost analysis prepared in late 2017 and reviewed by PJM in February  
17 2018. In that more recent analysis, Transource's claimed benefits from the IEC Project  
18 have been reduced by almost 50% to \$611 million over 15 years. That figure, however,  
19 still represents only the lower NLP (power costs) experienced in benefiting zones,  
20 primarily in MD-DC-VA. Once again, that alleged benefit ignores the higher power  
21 costs experienced in parts of Pennsylvania and other areas outside the benefiting region.  
22 The details of the calculation are provided in the Company's spreadsheet model. I have  
23 copied the results of the Company's model to Schedule SJR-2.

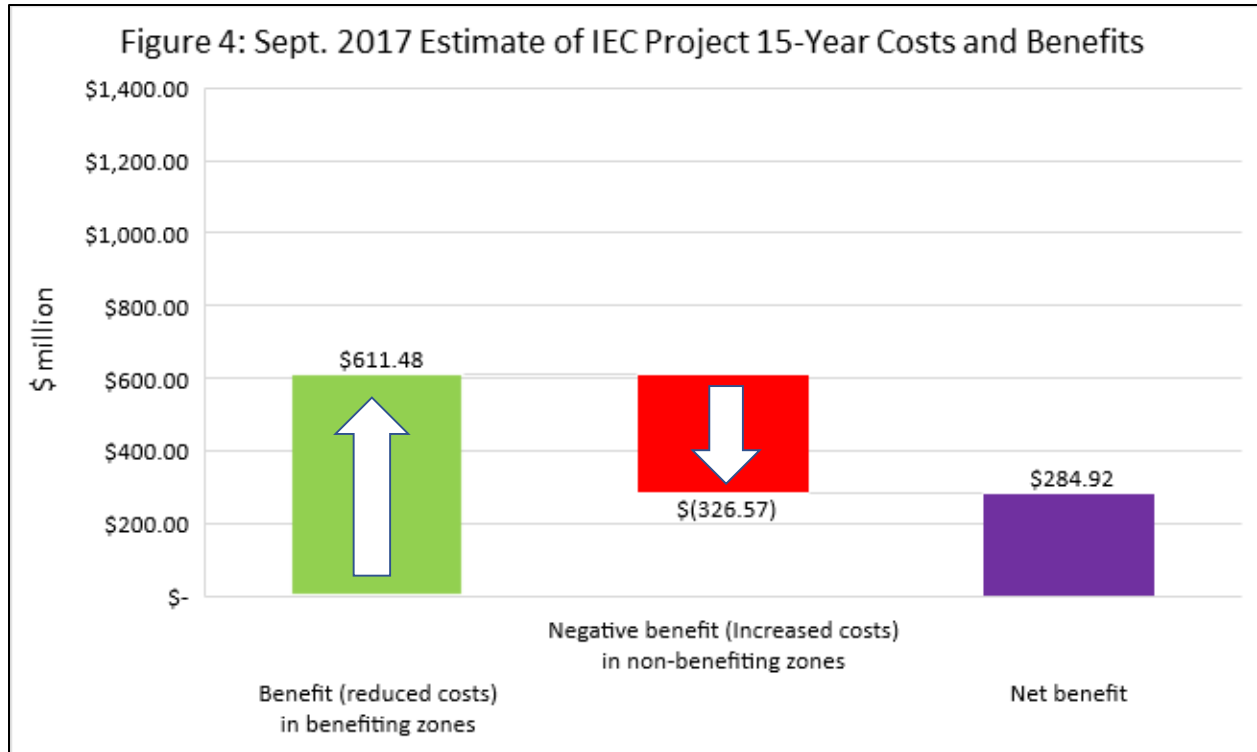
1 Q. Please describe the information shown in Schedule SJR-2.

2 A. Schedule SJR-2 shows the present value of the change in NLP – that is, the change in  
3 bulk power costs – for 15 years.

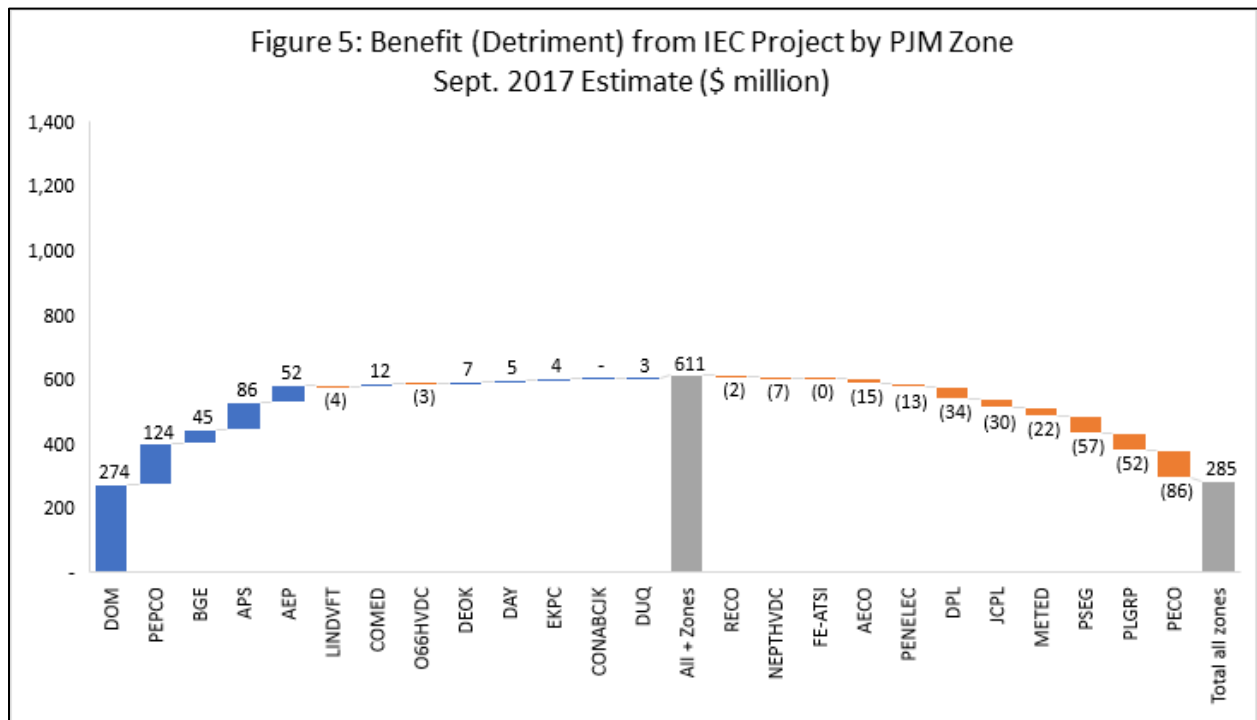
4 Schedule SJR-2 shows the winners and losers from the IEC Project. The major  
5 beneficiaries of the IEC Project (those with the largest negative numbers) are zones DOM  
6 (Dominion Power in Virginia) and PEPCO (Potomac Electric serving D.C. and portions  
7 of Maryland and Virginia). Together those two zones capture almost \$400 million in  
8 benefits from the IEC Project.

9 Q. Have you prepared graphs similar to Figures 2 and 3 using data from the late 2017 / early  
10 2018 re-evaluation of the IEC Project?

11 A. Yes. Figures 4 and 5 illustrate the distribution of benefits and detriments from the IEC  
12 Project, as those benefits and detriments were revised in late 2017. I prepared these  
13 figures using the same scale as Figures 2 and 3 so that the figures can be compared side-  
14 by-side, if desired. I also kept the zones in the same order (sorted from highest benefit to  
15 greatest detriment) that they appear in Figure 3.



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1 Q. Which zones are the biggest losers from the IEC Project according to the Company's late  
2 2017 / early 2018 analysis?

3 A. The biggest losers from the IEC Project are zones PECO (in Pennsylvania), PSEG  
4 (Public Service Electric & Gas in New Jersey), and PLGRP (PPL and UGI in  
5 Pennsylvania). Together, those three zones would see their bulk power costs increase by  
6 more than \$190 million over the first 15 years of the IEC Project.

7 Q. According to the data in Schedule SJR-2, what is the net benefit from the IEC Project?

8 A. The net benefit from the IEC Project over its first 15 years is \$284.92 million. This  
9 means that the IEC Project would reduce the overall cost of electricity in PJM by \$285  
10 million over 15 years, or roughly \$19 million per year.

11 Q. Is \$284.92 million the amount the Company used as the "benefits" from the IEC Project?

12 A. No. The Company's calculation of Project benefits includes only those zones that would  
13 have lower power costs if the IEC Project were completed, as I explained above. The  
14 Company eliminated zones where power costs increased. As I show on Schedule SJR-2,  
15 the sum of benefits in zones where power costs would be lower is \$611.48 million, and  
16 that is the figure that Transource consistently reports as the IEC Project's benefits.

17 Q. Is \$611.48 million an accurate reflection of the economic efficiency gains from the IEC  
18 Project?

19 A. No. This figure ignores the \$326.57 million in increased power costs that would be  
20 experienced by other zones. Simply stated, the IEC Project would result in somewhat  
21 lower power costs in PJM, but not nearly to the extent presented by the Company. The

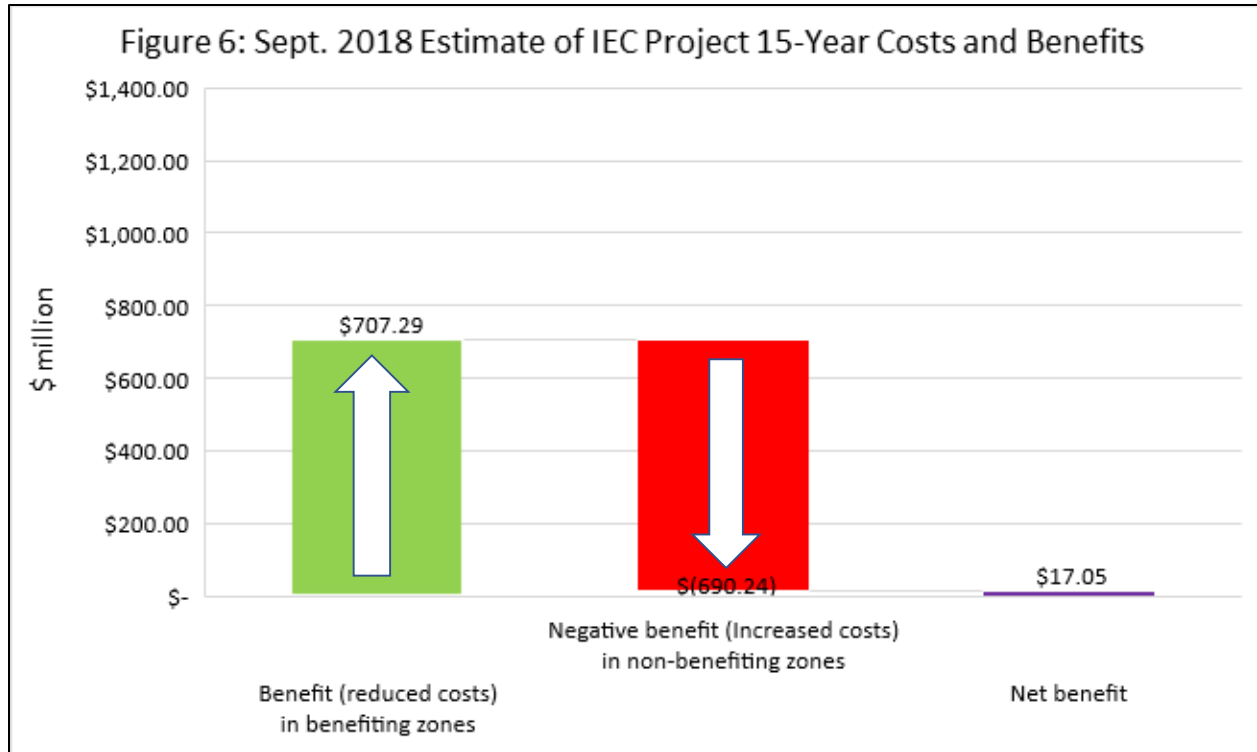
1 bottom line under the late 2017 analysis is that the IEC Project would reduce power costs  
2 within PJM by approximately \$285 million over 15 years.

3 Q. Do you have comparable figures from the TEAC's September 2018 re-evaluation of the  
4 IEC Project?

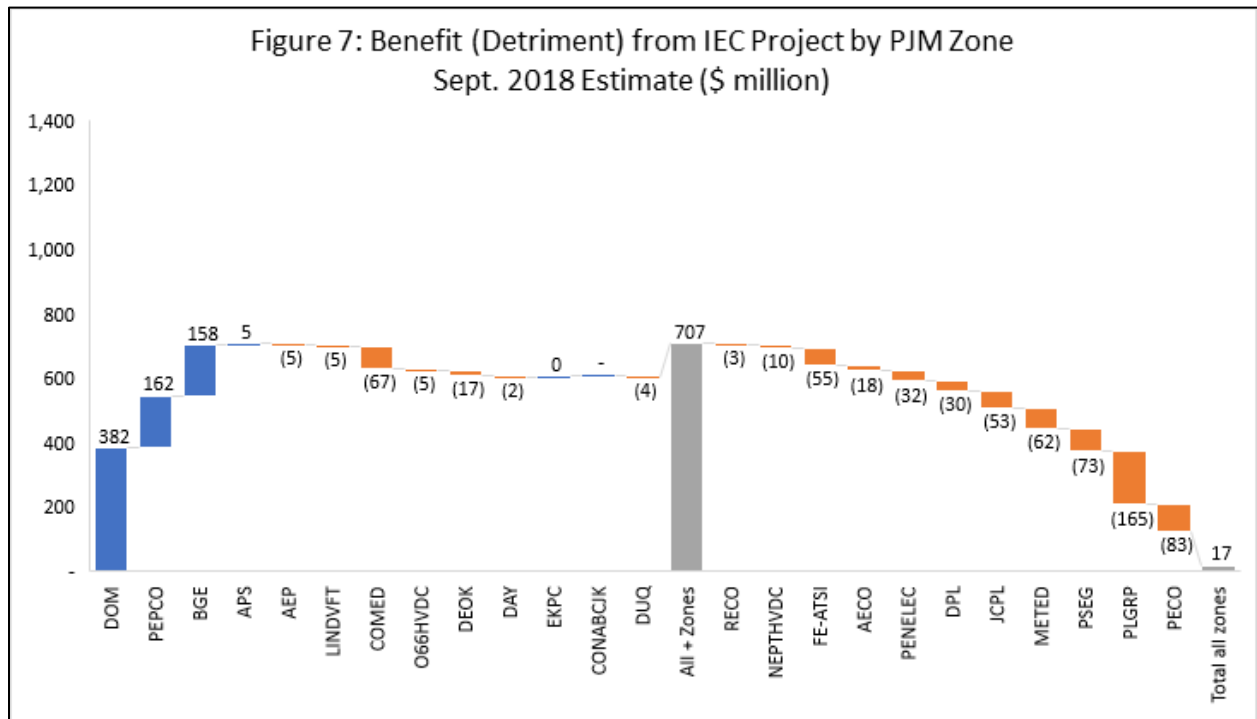
5 A. Yes. On September 19, 2018, Transource provided comparable information from PJM's  
6 September 2018 re-evaluation of the IEC Project. Attached as Schedule SJR-3 is the  
7 summary of benefits (negative numbers) and detriments (positive numbers) by PJM zone.

8 Q. Have you prepared graphs similar to Figures 2 and 3 using data from the September 2018  
9 re-evaluation of the IEC Project?

10 A. Yes. Figures 6 and 7 illustrate the distribution of benefits and detriments from the IEC  
11 Project, as those benefits and detriments were revised in September 2018. I prepared  
12 these figures using the same scale as Figures 2 and 3 so that the figures can be compared  
13 side-by-side, if desired. I also kept the zones in the same order (sorted from highest  
14 benefit to greatest detriment) that they appear in Figure 3.



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1 Q. Which zones are the biggest losers from the IEC Project according to the September 2018  
2 analysis?

3 A. The biggest losers from the IEC Project are zones PLGRP (PPL and UGI in  
4 Pennsylvania), PECO (in Pennsylvania), PSEG (Public Service Electric & Gas in New  
5 Jersey), COMED (Commonwealth Edison in Illinois), and METED (Metropolitan Edison  
6 in Pennsylvania). Each of these five zones would experience losses of more than \$60  
7 million, with the combined PPL/UGI zone experiencing a loss of \$165 million. Together,  
8 those five zones would see their bulk power costs increase by more than \$450 million  
9 over the first 15 years of the IEC Project.

10 Q. According to the data in Schedule SJR-3, what is the net benefit from the IEC Project?

11 A. The net benefit from the IEC Project over its first 15 years is down to just \$17 million.  
12 This means that the IEC Project would reduce the overall cost of electricity in PJM by  
13 \$17 million over 15 years, or roughly \$1 million per year.

14 Q. Is \$17 million the amount PJM and the Company used as the “benefits” from the IEC  
15 Project?

16 A. No. The September 2018 re-evaluation calculation of Project benefits includes only  
17 those zones that would have lower power costs if the IEC Project were completed, as I  
18 explained above. Zones where power costs increased were eliminated from the benefit-  
19 cost calculation. As I show on Schedule SJR-3, the sum of benefits in zones where  
20 power costs would be lower is \$707.29 million and that is the figure PJM used in its latest  
21 re-evaluation.

1 Q. Is \$707.29 million an accurate reflection of the economic efficiency gains from the IEC  
2 Project?

3 A. No. This figure ignores the \$690.24 million in increased power costs that would be  
4 experienced by other zones. Simply stated, the IEC Project would result in almost no  
5 change in total power costs in PJM. The bottom line under the September 2018 analysis  
6 is that the IEC Project would reduce power costs within PJM by just \$17 million over 15  
7 years.

8 Q. If the IEC Project provides net benefits of \$17 million over 15 years, should it be  
9 constructed?

10 A. No. As of September 2018, the estimated construction cost is \$366 million, resulting in  
11 an estimated 15-year cost (PVRR) of \$498 million. Thus, the IEC Project would cost  
12 significantly more than the benefits it would provide, resulting in a benefit-cost ratio of  
13 only 0.03. That is, for every dollar spent on the IEC Project, it would provide only three  
14 cents worth of benefits. Because the IEC Project is being built solely to reduce power  
15 costs, and not to provide any reliability benefits, the IEC Project is not economical and  
16 should not be built.

17 Q. You testified that the project cost estimate is now \$366.17 million. Do you know how  
18 the \$366 million cost estimate was derived?

19 A. PJM's most recent, detailed cost update was published in March 2018, so it does not  
20 exactly match the September figures. On Schedule SJR-4, I show the March 2018 cost  
21 estimates for each component of the IEC Project. That schedule also summarizes the  
22 results for each transmission owner. It can be seen that more than one-third of the cost  
23 would be incurred by utilities other than Transource.

1 Q. Are these cost estimates different than the original cost estimates in 2016?

2 A. Yes. The original cost estimate had a Transource cost of \$230 million and other utilities'  
3 costs of \$91 million. As of September 2018, Transource is still projecting a cost of \$230  
4 million, but the other affected utilities have increased their cost estimate by  
5 approximately 50% to \$136 million.<sup>13</sup>

6 Q. For the sake of clarity, in reaching your conclusions, did you change any of the  
7 Company's assumptions about the IEC Project?

8 A. No. I used the Company's results without making any changes in assumptions or  
9 underlying calculations. My conclusions are based solely on doing what I learned about  
10 cost-benefit analysis almost 40 years ago: you must count all of the benefits and costs;  
11 you cannot just cherry-pick those few areas that would be winners while ignoring all the  
12 losers.

13 Q. Under PJM's rules, who would pay the costs of the IEC Project?

14 A. Under PJM's rules, the IEC Project costs would be paid by the zones that benefit from  
15 the IEC Project, in proportion to the benefits. The cost responsibility for the project is  
16 determined when the project is approved.<sup>14</sup>

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<sup>13</sup> PJM TEAC Recommendations to the PJM Board (Staff Whitepaper) (Aug. 2, 2016), available at: <https://www.pjm.com/~media/committees-groups/committees/teac/20160811/20160811-board-whitepaper-august-2016.ashx>, shows the project cost as \$320.9 million (less Transource's cost of \$230 million equals other utility costs of \$90.9 million). The September 2018 re-evaluation cited above (PJM TEAC Transource AP-South (2014/15\_9A) Project Reevaluation (Sept. 13, 2018)) shows the project cost as \$366.17 million (less Transource's cost of \$230 million equals other utility costs of \$136.17 million).

<sup>14</sup> PJM TEAC Recommendations to the PJM Board (Staff Whitepaper) (Aug. 2, 2016), Attachment B, available at: <https://www.pjm.com/~media/committees-groups/committees/teac/20160811/20160811-board-whitepaper-august-2016.ashx>.

1 Q. Does that affect your conclusion that it would not be economical to construct the IEC  
2 Project?

3 A. No. On Schedule SJR-5, I show how the costs of the IEC Project would be distributed  
4 among the PJM zones. The Project costs are expressed as the PVRR over 15 years.  
5 Again, I would emphasize that this is the Company's calculation. I did not change any  
6 assumptions or calculations.

7 I show on the Schedule that the zones that benefit from the IEC Project (primarily  
8 MD-DC-VA) would see benefits of \$611 million and pay costs of \$498 million, for a net  
9 gain of \$113 million. Interestingly, because the benefits and detriments of the project  
10 have changed so dramatically since 2016, there are zones that appear to be required to  
11 pay for the project but are no longer receiving a benefit from the project. For example,  
12 Duquesne originally was projected to receive a minor benefit from the project, so it was  
13 allocated 0.01% of project costs. But the latest re-evaluation of the project shows that  
14 Duquesne's costs actually would increase by more than \$4 million over the 15-year  
15 period evaluated. The biggest swing occurs for Commonwealth Edison in Illinois, which  
16 originally was projected to receive a benefit of \$11.7 million from the project (and so was  
17 allocated 2% of project costs) but is now projected to see its power costs increase by  
18 more than \$67 million.

19 Q. To summarize, using the September 2018 detailed estimates, what do you conclude about  
20 the overall costs and benefits of the IEC Project?

21 A. I conclude that the IEC Project would not reduce total costs within PJM. In fact, the  
22 project would lower power costs by only \$17 million over 15 years (about \$1 million per  
23 year) but it would cost \$498 million over 15 years (more than \$33 million per year) to

1 achieve those savings. Let me say that again: The IEC project would cost \$498 million  
2 over 15 years, but it would lower power costs by only \$17 million, resulting in a net loss  
3 to PJM utilities of more than \$480 million. Thus, PJM as a whole would experience a net  
4 loss of \$32 million per year for each of the first 15 years of the IEC Project. The Project  
5 is not economical for PJM's utilities (and the consumers who purchase electricity from  
6 those utilities) and should not be constructed.

### 7 **Costs and Benefits of the IEC Project to Pennsylvania**

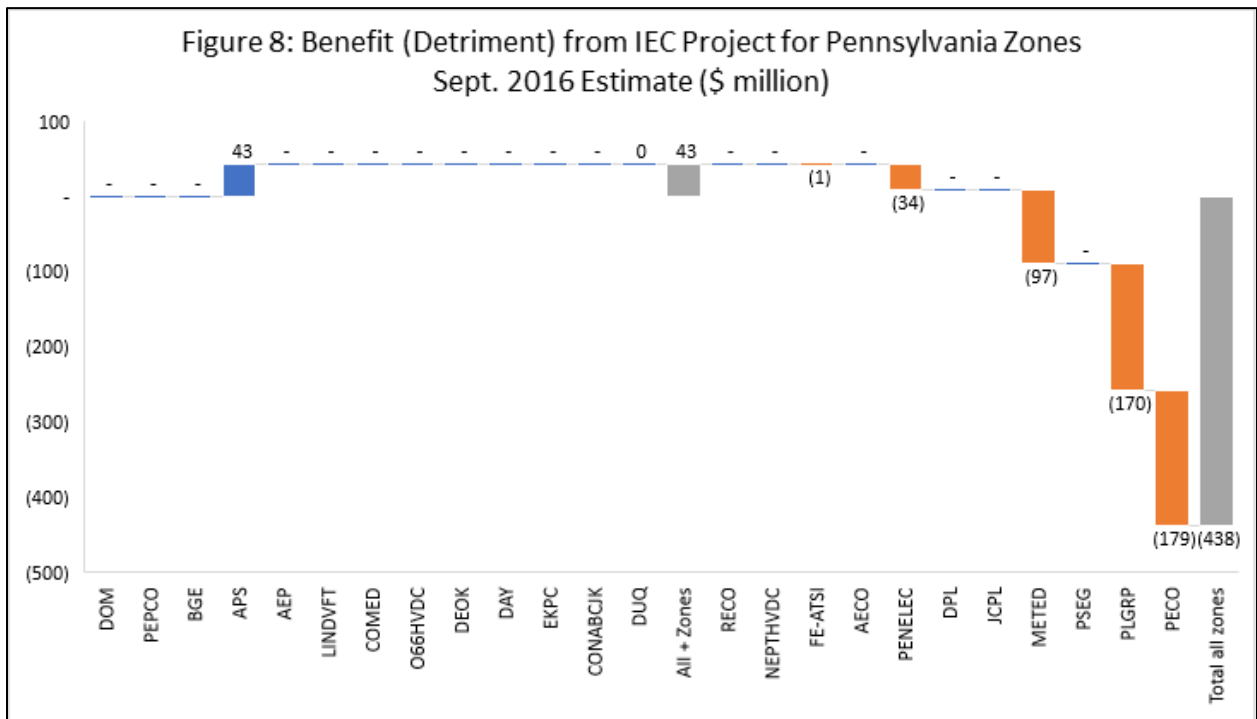
8 Q. Have you evaluated the costs and benefits associated with the IEC Project solely for  
9 Pennsylvania?

10 A. Yes, I have. Schedule SJR-6 reproduces Schedules SJR-1 (the September 2016  
11 estimate), SJR-2 (the September 2017 estimate), and SJR-3 (the September 2018  
12 estimate) but adds columns to calculate the portion of the costs and benefits that would be  
13 paid or received by customers of Pennsylvania's utilities. That information is then  
14 summarized on the first page of the Schedule. As I show on Schedule SJR-6, the PJM  
15 zones within Pennsylvania are APS (West Penn Power represents about 45% of this  
16 zone), DUQ (Duquesne), FE-ATSI (Penn Power is about 7% of this zone), METED,  
17 PECO, PENELEC, and PLGRP (PPL and UGI Electric, both of which are wholly within  
18 Pennsylvania).



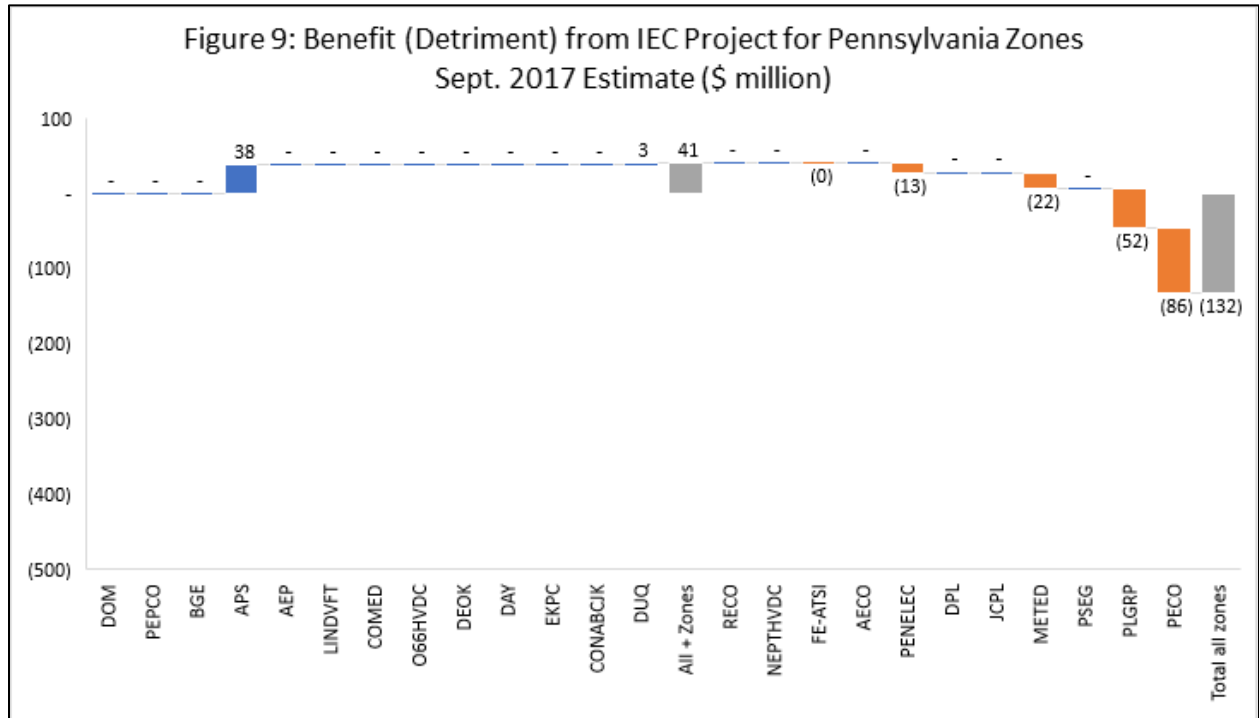
1 Q. From the information in Schedule SJR-6, can you determine the estimated benefits or  
 2 detriments for Pennsylvania’s utilities, and their customers, if the IEC Project were  
 3 completed?

4 A. Yes. First, using the September 2016 estimates, I produced Figure 8. This graph  
 5 reproduces Figure 3 but zeroes out the non-Pennsylvania utilities. For the two interstate  
 6 utility zones that include parts of Pennsylvania, Allegheny Power System (APS) and First  
 7 Energy’s ATSI (FE-ATSI), I estimated the percentage of benefits or detriments  
 8 attributable to Pennsylvania by using PJM data for each distribution utility’s estimated  
 9 summer peak load in 2018. (The calculation is shown in the note on Schedule SJR-6,  
 10 page 2.) Figure 8 shows that collectively Pennsylvania consumers would experience a  
 11 \$438 million detriment (that is, higher power costs) over 15 years, using the September  
 12 2016 estimate prepared by Transource.

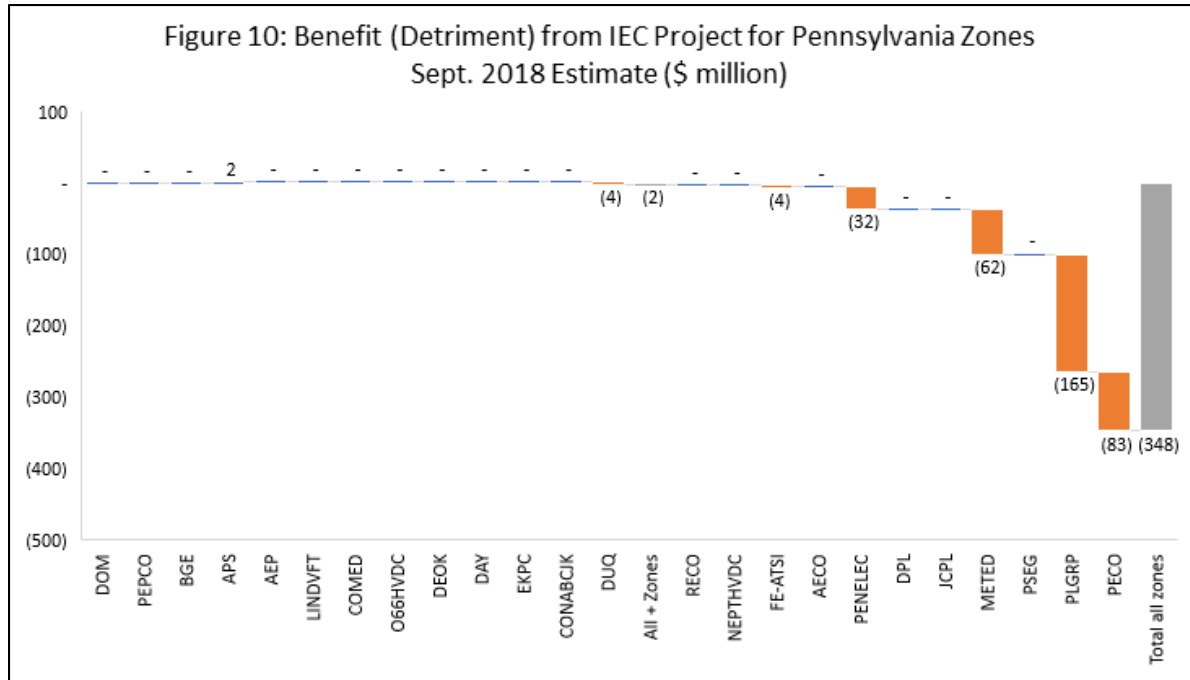


1 Q. Did you prepare similar graphs using the September 2017 and September 2018 re-  
 2 evaluations of the IEC Project?

3 A. Yes. Figures 9 and 10 provide similar graphs using data from the September 2017 and  
 4 September 2018 re-evaluations of the project.



5



1

2 Q. How much of the IEC Project’s costs would be paid by Pennsylvania’s utilities?

3 A. Schedule SJR-6 and Figure 7 show that one Pennsylvania zone (the Pennsylvania portion  
4 of APS) would have lower power costs under the 2018 estimate, totaling \$2 million.

5 Under the original cost allocation, the Pennsylvania portion of APS would pay \$19.46

6 million of the IEC Project’s costs as shown on Schedule SJR-7, resulting in a net cost for

7 West Penn customers of approximately \$17 million over 15 years, or about \$1 million per

8 year. The other six PJM zones within Pennsylvania would see their power costs increase

9 by \$349.91 million over 15 years, or by more than \$23 million per year. Thus, when

10 including the costs of paying for the IEC Project, the net effect on Pennsylvania would be

11 to have power costs increase by approximately \$367 million over the next 15 years, or by

12 more than \$24 million per year.

1 Q. Did you make any changes in the Company's analyses, assumptions, or calculations in  
2 reaching your conclusions about the effect on Pennsylvania consumers?

3 A. No. As I have for all other calculations, I used Transource's results without changing any  
4 of the underlying assumptions or calculations.

### 5 **Meaning of PJM Project Selection**

6 Q. What is your understanding about the role of the PJM Interconnection in the IEC Project?

7 A. As I understand it, PJM has selected the IEC Project as one that would provide economic  
8 efficiency benefits. As I discussed above, when PJM selected the IEC Project, it showed  
9 a benefit-cost ratio of 2.5 times. PJM evaluated the IEC Project a second time in late  
10 2017 / early 2018, which reduced the benefit-cost ratio of the IEC Project to 1.3 times.  
11 The most recent re-evaluation, released on September 13, 2018, shows a benefit-cost  
12 ratio of 1.4 times.

13 I already have explained why the methodology used to determine the benefit-cost  
14 ratio of the IEC Project is flawed because it ignores the effects on the "losing" zones  
15 within PJM.

16 Q. As a matter of regulatory policy (and not as a matter of law), in your opinion does PJM's  
17 selection of the IEC Project as one that should be pursued carry with it any implications  
18 for this Commission's review of the IEC Project?

19 A. In my opinion, as a matter of public policy, PJM's selection of the IEC Project should not  
20 supersede in any way this Commission's duty under Pennsylvania law and regulations to  
21 determine whether construction and operation of the IEC Project is necessary or proper

1 for the service, accommodation, convenience or safety of the public.<sup>15</sup> Indeed, in my  
2 opinion this Commission has the obligation to fully comply with the law and its  
3 regulations and independently determine whether the IEC Project is in the best interests  
4 of the Commonwealth in general and utility consumers in particular.

5 In discovery, OCA asked the representative of PJM (Transource witness  
6 McGlynn) whether PJM considered any of the factors this Commission is required to  
7 consider in approving the development and siting of two substations and more than 30  
8 miles of new high-voltage transmission lines. His responses demonstrate that PJM does  
9 not consider any of the factors this Commission must consider before approving  
10 substation siting, new transmission lines, or the specific locations of the line.<sup>16</sup> I have  
11 attached as Schedule SJR-8, copies of interrogatory answers where Mr. McGlynn  
12 acknowledges that PJM does not consider the issues associated with siting substations or  
13 transmission lines that this Commission is required to consider.<sup>17</sup>

14 Moreover, PJM's review process does not consider Pennsylvania law that requires  
15 projects to demonstrate that they have minimized environmental impacts (particularly on  
16 public lands and waterways) or adequately protected agricultural land.

17 Mr. McGlynn went to great lengths to explain the limit of PJM's selection of the  
18 IEC Project, stating: "PJM does not opine or determine the specific location or route of

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<sup>15</sup> See 15 Pa. C.S. § 1511 and 66 Pa. C.S. § 1501.

<sup>16</sup> See 52 Pa. Code §§ 57.71 to 57.77, 69.1101, and 69.3101 to 69.3107.

<sup>17</sup> Schedule SJR-8 includes Transource's responses to OCA Set II questions 2, 3, 5, 6, 7, 8, 10, and 11.

1 projects. The siting of the project components described in the Application is the  
2 responsibility of Transource PA.” Response to OCA II-03, included in Schedule SJR-8.

3 Q. In your opinion, again as a matter of regulatory policy and not as a question of law,  
4 should PJM’s selection of the IEC Project affect this Commission’s determination of  
5 need for the IEC Project?

6 A. In my opinion, as a matter of sound public policy, the Commission should make an  
7 independent determination of the need for the IEC Project, considering the likely costs  
8 (including environmental and land-use impacts) and benefits, as set forth in Pennsylvania  
9 law and regulations.

### 10 **Economic Need for the IEC Project**

11 Q. Do you have any understanding of how the Commission has determined the need for  
12 utility projects in the past?

13 A. I have a general understanding of how the Commission has determined need in other  
14 cases, but I have not conducted exhaustive research on this point. Generally, I  
15 understand that the Commission can consider both engineering need (that is, physical  
16 safety or reliability benefits) and economic need (that is, cost reductions) from projects.

17 Q. Based on your general understanding of how the need for a utility project can be  
18 determined, do you have an opinion concerning the need for the Transource Project?

19 A. Transource has not claimed any reliability or safety need for the IEC Project, so I do not  
20 believe engineering need is an issue in this case. The question, then, is whether there is  
21 an economic need for the IEC Project. As I explained above, if the IEC Project as a  
22 whole is evaluated, the IEC Project fails to pass a benefit-cost analysis. Indeed, looking

1 at the entire Project's impact on PJM, the net effect of the IEC Project would be to  
2 provide benefits (on a present-value basis) of \$1 million per year at a cost to electricity  
3 consumers of more than \$33 million per year. That is, the IEC Project would result in a  
4 net detriment to PJM of \$32 million per year for at least 15 years. In my opinion,  
5 therefore, Transource has failed to demonstrate an economic need for the IEC Project.

## 6 **Conclusion**

7 Q. Please summarize your conclusions and recommendations.

8 A. I conclude that Transource has failed to demonstrate an economic need for the IEC  
9 Project. The Company's own analyses show that the IEC Project's costs will greatly  
10 exceed its benefits. While the IEC Project likely would be successful in relieving some  
11 economic congestion within PJM, resulting in lower power costs in portions of Maryland,  
12 D.C., and Virginia, the costs of the IEC Project greatly exceed the benefits that would be  
13 achieved within PJM as a whole. Under PJM's most recent analysis, the IEC Project  
14 would generate benefits of only about three cents for each dollar spent.

15 The calculus for Pennsylvania is even worse. Pennsylvania consumers would  
16 receive almost none of the IEC Project's benefits – savings of just \$2 million in total for  
17 the first 15 years of the IEC Project (a present value of about \$0.1 million per year) for  
18 customers of West Penn Power. But energy consumers in the rest of the Commonwealth  
19 would pay increased costs of \$350 million – \$23 million per year (present value for 15  
20 years). Thus, construction and operation of the IEC Project would produce a net  
21 economic harm for Pennsylvania of approximately \$348 million. This would result in

1 higher electricity costs within the Commonwealth of \$23 million per year on a present-  
2 value basis for 15 years.

3 I recommend, therefore, that the Commission find that Transource has failed to  
4 demonstrate an economic need for the IEC Project. Based on that conclusion and the  
5 conclusions reached by other OCA witnesses, I recommend that the Commission deny  
6 the Applications and Petitions with prejudice. Construction and operation of the IEC  
7 Project would be harmful to Pennsylvania and the Commission should not permit it to be  
8 constructed.

9 Q. Does this conclude your direct testimony?

10 A. Yes.

11 259346

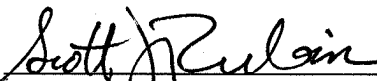


BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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.	:	
	:	A-2017-2640195
	:	A-2017-2640200
	:	
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.	:	
	:	P-2018-3001878
	:	
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.	:	
	:	P-2018-3001883
	:	
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.	:	
	:	A-2018-3001881,
	:	<i>et al.</i>

VERIFICATION

I, Scott Rubin, hereby state that the facts above set forth in my Direct Testimony OCA Statement No. 1 are true and correct and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Signature:   
Scott J. Rubin  
333 Oak Lane  
Bloomsburg, PA. 17815  
Scott.J.Rubin@gmail.com

DATED: September 25, 2018  
\*259166

**Scott J. Rubin**

**Appendix A**

## Appendix A

**Scott J. Rubin**

Attorney + Consultant

333 Oak Lane • Bloomsburg, PA 17815

### **Current Position**

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Public Utility Attorney and Consultant. 1994 to present. I provide legal, consulting, and expert witness services to various organizations interested in the regulation of public utilities.

### **Previous Positions**

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Lecturer in Computer Science, Susquehanna University, Selinsgrove, PA. 1993 to 2000.

Senior Assistant Consumer Advocate, Office of Consumer Advocate, Harrisburg, PA. 1990 to 1994.

I supervised the administrative and technical staff and shared with one other senior attorney the supervision of a legal staff of 14 attorneys.

Assistant Consumer Advocate, Office of Consumer Advocate, Harrisburg, PA. 1983 to 1990.

Associate, Laws and Staruch, Harrisburg, PA. 1981 to 1983.

Law Clerk, U.S. Environmental Protection Agency, Washington, DC. 1980 to 1981.

Research Assistant, Rockville Consulting Group, Washington, DC. 1979.

### **Current Professional Activities**

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Member, American Bar Association, Infrastructure and Regulated Industries Section.

Member, American Water Works Association.

Admitted to practice law before the Supreme Court of Pennsylvania, the New York State Court of Appeals, the United States District Court for the Middle District of Pennsylvania, the United States Court of Appeals for the Third Circuit, and the Supreme Court of the United States.

### **Previous Professional Activities**

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Member, American Water Works Association, Rates and Charges Subcommittee, 1998-2001.

Member, Federal Advisory Committee on Disinfectants and Disinfection By-Products in Drinking Water, U.S. Environmental Protection Agency, Washington, DC. 1992 to 1994.

Chair, Water Committee, National Association of State Utility Consumer Advocates, Washington, DC. 1990 to 1994; member of committee from 1988 to 1990.

Member, Board of Directors, Pennsylvania Energy Development Authority, Harrisburg, PA. 1990 to 1994.

Member, Small Water Systems Advisory Committee, Pennsylvania Department of Environmental Resources, Harrisburg, PA. 1990 to 1992.

Member, Ad Hoc Committee on Emissions Control and Acid Rain Compliance, National Association of State Utility Consumer Advocates, 1991.

Member, Nitrogen Oxides Subcommittee of the Acid Rain Advisory Committee, U.S. Environmental Protection Agency, Washington DC. 1991.

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### **Education**

J.D. with Honors, George Washington University, Washington, DC. 1981.

B.A. with Distinction in Political Science, Pennsylvania State University, University Park, PA. 1978.

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### **Publications and Presentations (\* denotes peer-reviewed publications)**

1. "Quality of Service Issues," a speech to the Pennsylvania Public Utility Commission Consumer Conference, State College, PA. 1988.
2. K.L. Pape and S.J. Rubin, "Current Developments in Water Utility Law," in *Pennsylvania Public Utility Law* (Pennsylvania Bar Institute). 1990.
3. Presentation on Water Utility Holding Companies to the Annual Meeting of the National Association of State Utility Consumer Advocates, Orlando, FL. 1990.
4. "How the OCA Approaches Quality of Service Issues," a speech to the Pennsylvania Chapter of the National Association of Water Companies. 1991.
5. Presentation on the Safe Drinking Water Act to the Mid-Year Meeting of the National Association of State Utility Consumer Advocates, Seattle, WA. 1991.
6. "A Consumer Advocate's View of Federal Pre-emption in Electric Utility Cases," a speech to the Pennsylvania Public Utility Commission Electricity Conference. 1991.
7. Workshop on Safe Drinking Water Act Compliance Issues at the Mid-Year Meeting of the National Association of State Utility Consumer Advocates, Washington, DC. 1992.
8. Formal Discussant, Regional Acid Rain Workshop, U.S. Environmental Protection Agency and National Regulatory Research Institute, Charlotte, NC. 1992.
9. S.J. Rubin and S.P. O'Neal, "A Quantitative Assessment of the Viability of Small Water Systems in Pennsylvania," *Proceedings of the Eighth NARUC Biennial Regulatory Information Conference*, National Regulatory Research Institute (Columbus, OH 1992), IV:79-97.
10. "The OCA's Concerns About Drinking Water," a speech to the Pennsylvania Public Utility Commission Water Conference. 1992.
11. Member, Technical Horizons Panel, Annual Meeting of the National Association of Water Companies, Hilton Head, SC. 1992.
12. M.D. Klein and S.J. Rubin, "Water and Sewer -- Update on Clean Streams, Safe Drinking Water, Waste Disposal and Pennvest," *Pennsylvania Public Utility Law Conference* (Pennsylvania Bar Institute). 1992.
13. Presentation on Small Water System Viability to the Technical Assistance Center for Small Water Companies, Pa. Department of Environmental Resources, Harrisburg, PA. 1993

14. "The Results Through a Public Service Commission Lens," speaker and participant in panel discussion at Symposium: "Impact of EPA's Allowance Auction," Washington, DC, sponsored by AER\*X. 1993.
15. "The Hottest Legislative Issue of Today -- Reauthorization of the Safe Drinking Water Act," speaker and participant in panel discussion at the Annual Conference of the American Water Works Association, San Antonio, TX. 1993.
16. "Water Service in the Year 2000," a speech to the Conference: "Utilities and Public Policy III: The Challenges of Change," sponsored by the Pennsylvania Public Utility Commission and the Pennsylvania State University, University Park, PA. 1993.
17. "Government Regulation of the Drinking Water Supply: Is it Properly Focused?," speaker and participant in panel discussion at the National Consumers League's Forum on Drinking Water Safety and Quality, Washington, DC. 1993. Reprinted in *Rural Water*, Vol. 15 No. 1 (Spring 1994), pages 13-16.
18. "Telephone Penetration Rates for Renters in Pennsylvania," a study prepared for the Pennsylvania Office of Consumer Advocate. 1993.
19. "Zealous Advocacy, Ethical Limitations and Considerations," participant in panel discussion at "Continuing Legal Education in Ethics for Pennsylvania Lawyers," sponsored by the Office of General Counsel, Commonwealth of Pennsylvania, State College, PA. 1993.
20. "Serving the Customer," participant in panel discussion at the Annual Conference of the National Association of Water Companies, Williamsburg, VA. 1993.
21. "A Simple, Inexpensive, Quantitative Method to Assess the Viability of Small Water Systems," a speech to the Water Supply Symposium, New York Section of the American Water Works Association, Syracuse, NY. 1993.
22. \* S.J. Rubin, "Are Water Rates Becoming Unaffordable?," *Journal American Water Works Association*, Vol. 86, No. 2 (February 1994), pages 79-86.
23. "Why Water Rates Will Double (If We're Lucky): Federal Drinking Water Policy and Its Effect on New England," a briefing for the New England Conference of Public Utilities Commissioners, Andover, MA. 1994.
24. "Are Water Rates Becoming Unaffordable?," a speech to the Legislative and Regulatory Conference, Association of Metropolitan Water Agencies, Washington, DC. 1994.
25. "Relationships: Drinking Water, Health, Risk and Affordability," speaker and participant in panel discussion at the Annual Meeting of the Southeastern Association of Regulatory Commissioners, Charleston, SC. 1994.
26. "Small System Viability: Assessment Methods and Implementation Issues," speaker and participant in panel discussion at the Annual Conference of the American Water Works Association, New York, NY. 1994.
27. S.J. Rubin, "How much should we spend to save a life?," *Seattle Journal of Commerce*, August 18, 1994 (Protecting the Environment Supplement), pages B-4 to B-5.

28. S. Rubin, S. Bernow, M. Fulmer, J. Goldstein, and I. Peters, *An Evaluation of Kentucky-American Water Company's Long-Range Planning*, prepared for the Utility and Rate Intervention Division, Kentucky Office of the Attorney General (Tellus Institute 1994).
29. S.J. Rubin, "Small System Monitoring: What Does It Mean?," *Impacts of Monitoring for Phase II/V Drinking Water Regulations on Rural and Small Communities* (National Rural Water Association 1994), pages 6-12.
30. "Surviving the Safe Drinking Water Act," speaker at the Annual Meeting of the National Association of State Utility Consumer Advocates, Reno, NV. 1994.
31. "Safe Drinking Water Act Compliance -- Ratemaking Implications," speaker at the National Conference of Regulatory Attorneys, Scottsdale, AZ. 1995. Reprinted in *Water*, Vol. 36, No. 2 (Summer 1995), pages 28-29.
32. S.J. Rubin, "Water: Why Isn't it Free? The Case of Small Utilities in Pennsylvania," *Utilities, Consumers & Public Policy: Issues of Quality, Affordability, and Competition, Proceedings of the Fourth Utilities, Consumers and Public Policy Conference* (Pennsylvania State University 1995), pages 177-183.
33. S.J. Rubin, "Water Rates: An Affordable Housing Issue?," *Home Energy*, Vol. 12 No. 4 (July/August 1995), page 37.
34. Speaker and participant in the Water Policy Forum, sponsored by the National Association of Water Companies, Naples, FL. 1995.
35. Participant in panel discussion on "The Efficient and Effective Maintenance and Delivery of Potable Water at Affordable Rates to the People of New Jersey," at The New Advocacy: Protecting Consumers in the Emerging Era of Utility Competition, a conference sponsored by the New Jersey Division of the Ratepayer Advocate, Newark, NJ. 1995.
36. J.E. Cromwell III, and S.J. Rubin, *Development of Benchmark Measures for Viability Assessment* (Pa. Department of Environmental Protection 1995).
37. S. Rubin, "A Nationwide Practice from a Small Town in Pa.," *Lawyers & the Internet – a Supplement to the Legal Intelligencer and Pa. Law Weekly* (February 12, 1996), page S6.
38. "Changing Customers' Expectations in the Water Industry," speaker at the Mid-America Regulatory Commissioners Conference, Chicago, IL. 1996, reprinted in *Water* Vol. 37 No. 3 (Winter 1997), pages 12-14.
39. "Recent Federal Legislation Affecting Drinking Water Utilities," speaker at Pennsylvania Public Utility Law Conference, Pennsylvania Bar Institute, Hershey, PA. 1996.
40. "Clean Water at Affordable Rates: A Ratepayers Conference," moderator at symposium sponsored by the New Jersey Division of Ratepayer Advocate, Trenton, NJ. 1996.

41. "Water Workshop: How New Laws Will Affect the Economic Regulation of the Water Industry," speaker at the Annual Meeting of the National Association of State Utility Consumer Advocates, San Francisco, CA. 1996.
42. \* E.T. Castillo, S.J. Rubin, S.K. Keefe, and R.S. Raucher, "Restructuring Small Systems," *Journal American Water Works Association*, Vol. 89, No. 1 (January 1997), pages 65-74.
43. \* J.E. Cromwell III, S.J. Rubin, F.C. Marrocco, and M.E. Leevan, "Business Planning for Small System Capacity Development," *Journal American Water Works Association*, Vol. 89, No. 1 (January 1997), pages 47-57.
44. "Capacity Development – More than Viability Under a New Name," speaker at National Association of Regulatory Utility Commissioners Winter Meetings, Washington, DC. 1997.
45. \* E. Castillo, S.K. Keefe, R.S. Raucher, and S.J. Rubin, *Small System Restructuring to Facilitate SDWA Compliance: An Analysis of Potential Feasibility* (AWWA Research Foundation, 1997).
46. H. Himmelberger, *et al.*, *Capacity Development Strategy Report for the Texas Natural Resource Conservation Commission* (Aug. 1997).
47. Briefing on Issues Affecting the Water Utility Industry, Annual Meeting of the National Association of State Utility Consumer Advocates, Boston, MA. 1997.
48. "Capacity Development in the Water Industry," speaker at the Annual Meeting of the National Association of Regulatory Utility Commissioners, Boston, MA. 1997.
49. "The Ticking Bomb: Competitive Electric Metering, Billing, and Collection," speaker at the Annual Meeting of the National Association of State Utility Consumer Advocates, Boston, MA. 1997.
50. Scott J. Rubin, "A Nationwide Look at the Affordability of Water Service," *Proceedings of the 1998 Annual Conference of the American Water Works Association*, Water Research, Vol. C, No. 3, pages 113-129 (American Water Works Association, 1998).
51. Scott J. Rubin, "30 Technology Tips in 30 Minutes," *Pennsylvania Public Utility Law Conference*, Vol. I, pages 101-110 (Pa. Bar Institute, 1998).
52. Scott J. Rubin, "Effects of Electric and Gas Deregulation on the Water Industry," *Pennsylvania Public Utility Law Conference*, Vol. I, pages 139-146 (Pa. Bar Institute, 1998).
53. Scott J. Rubin, *The Challenges and Changing Mission of Utility Consumer Advocates* (American Association of Retired Persons, 1999).
54. "Consumer Advocacy for the Future," speaker at the Age of Awareness Conference, Changes and Choices: Utilities in the New Millennium, Carlisle, PA. 1999.
55. Keynote Address, \$1 Energy Fund, Inc., Annual Membership Meeting, Monroeville, PA. 1999.
56. Scott J. Rubin, "Assessing the Effect of the Proposed Radon Rule on the Affordability of Water Service," prepared for the American Water Works Association. 1999.

57. Scott J. Rubin and Janice A. Beecher, The Impacts of Electric Restructuring on the Water and Wastewater Industry, *Proceedings of the Small Drinking Water and Wastewater Systems International Symposium and Technology Expo* (Phoenix, AZ 2000), pp. 66-75.
58. American Water Works Association, *Principles of Water Rates, Fees, and Charges, Manual M1 – Fifth Edition* (AWWA 2000), Member, Editorial Committee.
59. Janice A. Beecher and Scott J. Rubin, presentation on “Special Topics in Rate Design: Affordability” at the Annual Conference and Exhibition of the American Water Works Association, Denver, CO. 2000.
60. Scott J. Rubin, “The Future of Drinking Water Regulation,” a speech at the Annual Conference and Exhibition of the American Water Works Association, Denver, CO. 2000.
61. Janice A. Beecher and Scott J. Rubin, “Deregulation Impacts and Opportunities,” a presentation at the Annual Conference and Exhibition of the American Water Works Association, Denver, CO. 2000.
62. Scott J. Rubin, “Estimating the Effect of Different Arsenic Maximum Contaminant Levels on the Affordability of Water Service,” prepared for the American Water Works Association. 2000.
63. \* Janice A. Beecher and Scott J. Rubin, *Deregulation! Impacts on the Water Industry*, American Water Works Association Research Foundation, Denver, CO. 2000.
64. Scott J. Rubin, Methods for Assessing, Evaluating, and Assisting Small Water Systems, NARUC Annual Regulatory Studies Program, East Lansing, MI. 2000.
65. Scott J. Rubin, Consumer Issues in the Water Industry, NARUC Annual Regulatory Studies Program, East Lansing, MI. 2000.
66. “Be Utility Wise in a Restructured Utility Industry,” Keynote Address at Be UtilityWise Conference, Pittsburgh, PA. 2000.
67. Scott J. Rubin, Jason D. Sharp, and Todd S. Stewart, “The Wired Administrative Lawyer,” *5<sup>th</sup> Annual Administrative Law Symposium*, Pennsylvania Bar Institute, Harrisburg, PA. 2000.
68. Scott J. Rubin, “Current Developments in the Water Industry,” *Pennsylvania Public Utility Law Conference*, Pennsylvania Bar Institute, Harrisburg, PA. 2000.
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### **Testimony as an Expert Witness**

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9. *An Investigation of the Sources of Supply and Future Demand of Kentucky-American Water Company*, Ky. Public Service Commission, Case No. 93-434. 1994. Concerning supply and demand planning, on behalf of the Kentucky Office of Attorney General, Utility and Rate Intervention Division.
10. *The Petition on Behalf of Gordon's Corner Water Company for an Increase in Rates*, New Jersey Board of Public Utilities, Docket No. WR94020037. 1994. Concerning revenue requirements and rate design, on behalf of the New Jersey Division of Ratepayer Advocate.

11. *Re Consumers Maine Water Company Request for Approval of Contracts with Consumers Water Company and with Ohio Water Service Company*, Me. Public Utilities Commission, Docket No. 94-352. 1994. Concerning affiliated interest agreements, on behalf of the Maine Public Advocate.
12. *In the Matter of the Application of Potomac Electric Power Company for Approval of its Third Least-Cost Plan*, D.C. Public Service Commission, Formal Case No. 917, Phase II. 1995. Concerning Clean Air Act implementation and environmental externalities, on behalf of the District of Columbia Office of the People's Counsel.
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14. *Kennebec Water District Proposed Increase in Rates*, Maine Public Utilities Commission, Docket No. 95-091. 1995. Concerning the reasonableness of planning decisions and the relationship between a publicly owned water district and a very large industrial customer, on behalf of the Maine Public Advocate.
15. *Winter Harbor Water Company, Proposed Schedule Revisions to Introduce a Readiness-to-Serve Charge*, Maine Public Utilities Commission, Docket No. 95-271. 1995 and 1996. Concerning standards for, and the reasonableness of, imposing a readiness to serve charge and/or exit fee on the customers of a small investor-owned water utility, on behalf of the Maine Public Advocate.
16. *In the Matter of the 1995 Long-Term Electric Forecast Report of the Cincinnati Gas & Electric Company*, Public Utilities Commission of Ohio, Case No. 95-203-EL-FOR, and *In the Matter of the Two-Year Review of the Cincinnati Gas & Electric Company's Environmental Compliance Plan Pursuant to Section 4913.05, Revised Cost*, Case No. 95-747-EL-ECP. 1996. Concerning the reasonableness of the utility's long-range supply and demand-management plans, the reasonableness of its plan for complying with the Clean Air Act Amendments of 1990, and discussing methods to ensure the provision of utility service to low-income customers, on behalf of the Office of the Ohio Consumers' Counsel..
17. *In the Matter of Notice of the Adjustment of the Rates of Kentucky-American Water Company*, Kentucky Public Service Commission, Case No. 95-554. 1996. Concerning rate design, cost of service, and sales forecast issues, on behalf of the Kentucky Office of Attorney General.
18. *In the Matter of the Application of Citizens Utilities Company for a Hearing to Determine the Fair Value of its Properties for Ratemaking Purposes, to Fix a Just and Reasonable Rate of Return Thereon, and to Approve Rate Schedules Designed to Provide such Rate of Return*, Arizona Corporation Commission, Docket Nos. E-1032-95-417, *et al.* 1996. Concerning rate design, cost of service, and the price elasticity of water demand, on behalf of the Arizona Residential Utility Consumer Office.
19. *Cochrane v. Bangor Hydro-Electric Company*, Maine Public Utilities Commission, Docket No. 96-053. 1996. Concerning regulatory requirements for an electric utility to engage in unregulated business enterprises, on behalf of the Maine Public Advocate.
20. *In the Matter of the Regulation of the Electric Fuel Component Contained within the Rate Schedules of Monongahela Power Company and Related Matters*, Public Utilities Commission of Ohio, Case No. 96-106-EL-EFC. 1996. Concerning the costs and procedures associated with the implementation of the Clean Air Act Amendments of 1990, on behalf of the Ohio Consumers' Counsel.

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23. *An Investigation of the Sources of Supply and Future Demand of Kentucky-American Water Company (Phase II)*, Kentucky Public Service Commission, Docket No. 93-434. 1997. Concerning supply and demand planning, on behalf of the Kentucky Office of Attorney General, Public Service Litigation Branch.
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25. *Bangor Hydro-Electric Company Petition for Temporary Rate Increase*, Maine Public Utilities Commission, Docket No. 97-201. 1997. Concerning the reasonableness of granting an electric utility's request for emergency rate relief, and related issues, on behalf of the Maine Public Advocate.
26. *Testimony concerning H.B. 1068 Relating to Restructuring of the Natural Gas Utility Industry*, Consumer Affairs Committee, Pennsylvania House of Representatives. 1997. Concerning the provisions of proposed legislation to restructure the natural gas utility industry in Pennsylvania, on behalf of the Pennsylvania AFL-CIO Gas Utility Caucus.
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28. *In the Matter of the Petition of Valley Road Sewerage Company for a Revision in Rates and Charges for Water Service*, New Jersey Board of Public Utilities, Docket No. WR92080846J. 1997. Concerning the revenue requirements and rate design for a wastewater treatment utility, on behalf of the New Jersey Division of Ratepayer Advocate.
29. *Bangor Gas Company, L.L.C., Petition for Approval to Furnish Gas Service in the State of Maine*, Maine Public Utilities Commission, Docket No. 97-795. 1998. Concerning the standards and public policy concerns involved in issuing a certificate of public convenience and necessity for a new natural gas utility, and related ratemaking issues, on behalf of the Maine Public Advocate.
30. *In the Matter of the Investigation on Motion of the Commission into the Adequacy of the Public Utility Water Service Provided by Tidewater Utilities, Inc., in Areas in Southern New Castle County, Delaware*,

Delaware Public Service Commission, Docket No. 309-97. 1998. Concerning the standards for the provision of efficient, sufficient, and adequate water service, and the application of those standards to a water utility, on behalf of the Delaware Division of the Public Advocate.

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32. *Olde Port Mariner Fleet, Inc. Complaint Regarding Casco Bay Island Transit District's Tour and Charter Service*, Maine Public Utilities Commission, Docket No. 98-161. 1998. Concerning the standards and requirements for allocating costs and separating operations between regulated and unregulated operations of a transportation utility, on behalf of the Maine Public Advocate and Olde Port Mariner Fleet, Inc.
33. *Central Maine Power Company Investigation of Stranded Costs, Transmission and Distribution Utility Revenue Requirements, and Rate Design*, Maine Public Utilities Commission, Docket No. 97-580. 1998. Concerning the treatment of existing rate discounts when designing rates for a transmission and distribution electric utility, on behalf of the Maine Public Advocate.
34. *Pa. Public Utility Commission v. Manufacturers Water Company*, Pennsylvania Public Utility Commission, Docket No. R-00984275. 1998. Concerning rate design on behalf of the Manufacturers Water Industrial Users.
35. *In the Matter of Petition of Pennsgrove Water Supply Company for an Increase in Rates for Water Service*, New Jersey Board of Public Utilities, Docket No. WR98030147. 1998. Concerning the revenue requirements, level of affiliated charges, and rate design for a water utility, on behalf of the New Jersey Division of Ratepayer Advocate.
36. *In the Matter of Petition of Seaview Water Company for an Increase in Rates for Water Service*, New Jersey Board of Public Utilities, Docket No. WR98040193. 1999. Concerning the revenue requirements and rate design for a water utility, on behalf of the New Jersey Division of Ratepayer Advocate.
37. *In the Matter of the Regulation of the Electric Fuel Component Contained within the Rate Schedules of Ohio Power Company and Columbus Southern Power Company and Related Matters*, Public Utilities Commission of Ohio, Case Nos. 98-101-EL-EFC and 98-102-EL-EFC. 1999. Concerning the costs and procedures associated with the implementation of the Clean Air Act Amendments of 1990, on behalf of the Ohio Consumers' Counsel.
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40. *County of Suffolk, et al. v. Long Island Lighting Company, et al.*, U.S. District Court for the Eastern District of New York, Case No. 87-CV-0646. 2000. Submitted two affidavits concerning the calculation and collection of court-ordered refunds to utility customers, on behalf of counsel for the plaintiffs.
41. *Northern Utilities, Inc., Petition for Waivers from Chapter 820*, Maine Public Utilities Commission, Docket No. 99-254. 2000. Concerning the standards and requirements for defining and separating a natural gas utility's core and non-core business functions, on behalf of the Maine Public Advocate.
42. *Notice of Adjustment of the Rates of Kentucky-American Water Company*, Kentucky Public Service Commission, Case No. 2000-120. 2000. Concerning the appropriate methods for allocating costs and designing rates, on behalf of the Kentucky Office of Attorney General.
43. *In the Matter of the Petition of Gordon's Corner Water Company for an Increase in Rates and Charges for Water Service*, New Jersey Board of Public Utilities, Docket No. WR00050304. 2000. Concerning the revenue requirements and rate design for a water utility, on behalf of the New Jersey Division of Ratepayer Advocate.
44. *Testimony concerning Arsenic in Drinking Water: An Update on the Science, Benefits, and Costs*, Committee on Science, United States House of Representatives. 2001. Concerning the effects on low-income households and small communities from a more stringent regulation of arsenic in drinking water.
45. *In the Matter of the Application of The Cincinnati Gas & Electric Company for an Increase in Gas Rates in its Service Territory*, Public Utilities Commission of Ohio, Case No. 01-1228-GA-AIR, et al. 2002. Concerning the need for and structure of a special rider and alternative form of regulation for an accelerated main replacement program, on behalf of the Ohio Consumers' Counsel.
46. *Pennsylvania State Treasurer's Hearing on Enron and Corporate Governance Issues*. 2002. Concerning Enron's role in Pennsylvania's electricity market and related issues, on behalf of the Pennsylvania AFL-CIO.
47. *An Investigation into the Feasibility and Advisability of Kentucky-American Water Company's Proposed Solution to its Water Supply Deficit*, Kentucky Public Service Commission, Case No. 2001-00117. 2002. Concerning water supply planning, regulatory oversight, and related issue, on behalf of the Kentucky Office of Attorney General.
48. *Joint Application of Pennsylvania-American Water Company and Thames Water Aqua Holdings GmbH*, Pennsylvania Public Utility Commission, Docket Nos. A-212285F0096 and A-230073F0004. 2002. Concerning the risks and benefits associated with the proposed acquisition of a water utility, on behalf of the Pennsylvania Office of Consumer Advocate.
49. *Application for Approval of the Transfer of Control of Kentucky-American Water Company to RWE AG and Thames Water Aqua Holdings GmbH*, Kentucky Public Service Commission, Case No. 2002-00018. 2002. Concerning the risks and benefits associated with the proposed acquisition of a water utility, on behalf of the Kentucky Office of Attorney General.
50. *Joint Petition for the Consent and Approval of the Acquisition of the Outstanding Common Stock of American Water Works Company, Inc., the Parent Company and Controlling Shareholder of West Virginia-American Water Company*, West Virginia Public Service Commission, Case No. 01-1691-W-PC. 2002.



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52. *Illinois-American Water Company, Proposed General Increase in Water Rates*, Illinois Commerce Commission, Docket No. 02-0690. 2003. Concerning rate design and cost of service issues, on behalf of the Illinois Office of the Attorney General.
53. *Pennsylvania Public Utility Commission v. Pennsylvania-American Water Company*, Pennsylvania Public Utility Commission, Docket No. R-00038304. 2003. Concerning rate design and cost of service issues, on behalf of the Pennsylvania Office of Consumer Advocate.
54. *West Virginia-American Water Company*, West Virginia Public Service Commission, Case No. 03-0353-W-42T. 2003. Concerning affordability, rate design, and cost of service issues, on behalf of the West Virginia Consumer Advocate Division.
55. *Petition of Seabrook Water Corp. for an Increase in Rates and Charges for Water Service*, New Jersey Board of Public Utilities, Docket No. WR3010054. 2003. Concerning revenue requirements, rate design, prudence, and regulatory policy, on behalf of the New Jersey Division of Ratepayer Advocate.
56. *Chesapeake Ranch Water Co. v. Board of Commissioners of Calvert County*, U.S. District Court for Southern District of Maryland, Civil Action No. 8:03-cv-02527-AW. 2004. Submitted expert report concerning the expected level of rates under various options for serving new commercial development, on behalf of the plaintiff.
57. *Testimony concerning Lead in Drinking Water*, Committee on Government Reform, United States House of Representatives. 2004. Concerning the trade-offs faced by low-income households when drinking water costs increase, including an analysis of H.R. 4268.
58. *West Virginia-American Water Company*, West Virginia Public Service Commission, Case No. 04-0373-W-42T. 2004. Concerning affordability and rate comparisons, on behalf of the West Virginia Consumer Advocate Division.
59. *West Virginia-American Water Company*, West Virginia Public Service Commission, Case No. 04-0358-W-PC. 2004. Concerning costs, benefits, and risks associated with a wholesale water sales contract, on behalf of the West Virginia Consumer Advocate Division.
60. *Kentucky-American Water Company*, Kentucky Public Service Commission, Case No. 2004-00103. 2004. Concerning rate design and tariff issues, on behalf of the Kentucky Office of Attorney General.
61. *New Landing Utility, Inc.*, Illinois Commerce Commission, Docket No. 04-0610. 2005. Concerning the adequacy of service provided by, and standards of performance for, a water and wastewater utility, on behalf of the Illinois Office of Attorney General.

62. *People of the State of Illinois v. New Landing Utility, Inc.*, Circuit Court of the 15<sup>th</sup> Judicial District, Ogle County, Illinois, No. 00-CH-97. 2005. Concerning the standards of performance for a water and wastewater utility, including whether a receiver should be appointed to manage the utility's operations, on behalf of the Illinois Office of Attorney General.
63. *Hope Gas, Inc. d/b/a Dominion Hope*, West Virginia Public Service Commission, Case No. 05-0304-G-42T. 2005. Concerning the utility's relationships with affiliated companies, including an appropriate level of revenues and expenses associated with services provided to and received from affiliates, on behalf of the West Virginia Consumer Advocate Division.
64. *Monongahela Power Co. and The Potomac Edison Co.*, West Virginia Public Service Commission, Case Nos. 05-0402-E-CN and 05-0750-E-PC. 2005. Concerning review of a plan to finance the construction of pollution control facilities and related issues, on behalf of the West Virginia Consumer Advocate Division.
65. *Joint Application of Duke Energy Corp., et al., for Approval of a Transfer and Acquisition of Control*, Case Kentucky Public Service Commission, No. 2005-00228. 2005. Concerning the risks and benefits associated with the proposed acquisition of an energy utility, on behalf of the Kentucky Office of the Attorney General.
66. *Commonwealth Edison Company proposed general revision of rates, restructuring and price unbundling of bundled service rates, and revision of other terms and conditions of service*, Illinois Commerce Commission, Docket No. 05-0597. 2005. Concerning rate design and cost of service, on behalf of the Illinois Office of Attorney General.
67. *Pennsylvania Public Utility Commission v. Aqua Pennsylvania, Inc.*, Pennsylvania Public Utility Commission, Docket No. R-00051030. 2006. Concerning rate design and cost of service, on behalf of the Pennsylvania Office of Consumer Advocate.
68. *Central Illinois Light Company d/b/a AmerenCILCO, Central Illinois Public Service Company d/b/a AmerenCIPS, and Illinois Power Company d/b/a AmerenIP, proposed general increases in rates for delivery service*, Illinois Commerce Commission, Docket Nos. 06-0070, et al. 2006. Concerning rate design and cost of service, on behalf of the Illinois Office of Attorney General.
69. *Grens, et al., v. Illinois-American Water Co.*, Illinois Commerce Commission, Docket Nos. 5-0681, et al. 2006. Concerning utility billing, metering, meter reading, and customer service practices, on behalf of the Illinois Office of Attorney General and the Village of Homer Glen, Illinois.
70. *Commonwealth Edison Company Petition for Approval of Tariffs Implementing ComEd's Proposed Residential Rate Stabilization Program*, Illinois Commerce Commission, Docket No. 06-0411. 2006. Concerning a utility's proposed purchased power phase-in proposal, in behalf of the Illinois Office of Attorney General.
71. *Illinois-American Water Company, Application for Approval of its Annual Reconciliation of Purchased Water and Purchased Sewage Treatment Surcharges Pursuant to 83 Ill. Adm. Code 655*, Illinois Commerce Commission, Docket No. 06-0196. 2006. Concerning the reconciliation of purchased water and sewer charges, on behalf of the Illinois Office of Attorney General and the Village of Homer Glen, Illinois.

72. *Illinois-American Water Company, et al.*, Illinois Commerce Commission, Docket No. 06-0336. 2006. Concerning the risks and benefits associated with the proposed divestiture of a water utility, on behalf of the Illinois Office of Attorney General.
73. *Joint Petition of Kentucky-American Water Company, et al.*, Kentucky Public Service Commission, Docket No. 2006-00197. 2006. Concerning the risks and benefits associated with the proposed divestiture of a water utility, on behalf of the Kentucky Office of Attorney General.
74. *Aqua Illinois, Inc. Proposed Increase in Water Rates for the Kankakee Division*, Illinois Commerce Commission, Docket No. 06-0285. 2006. Concerning various revenue requirement, rate design, and tariff issues, on behalf of the County of Kankakee.
75. *Housing Authority for the City of Pottsville v. Schuylkill County Municipal Authority*, Court of Common Pleas of Schuylkill County, Pennsylvania, No. S-789-2000. 2006. Concerning the reasonableness and uniformity of rates charged by a municipal water authority, on behalf of the Pottsville Housing Authority.
76. *Application of Pennsylvania-American Water Company for Approval of a Change in Control*, Pennsylvania Public Utility Commission, Docket No. A-212285F0136. 2006. Concerning the risks and benefits associated with the proposed divestiture of a water utility, on behalf of the Pennsylvania Office of Consumer Advocate.
77. *Application of Artesian Water Company, Inc., for an Increase in Water Rates*, Delaware Public Service Commission, Docket No. 06-158. 2006. Concerning rate design and cost of service, on behalf of the Staff of the Delaware Public Service Commission.
78. *Central Illinois Light Company, Central Illinois Public Service Company, and Illinois Power Company: Petition Requesting Approval of Deferral and Securitization of Power Costs*, Illinois Commerce Commission, Docket No. 06-0448. 2006. Concerning a utility's proposed purchased power phase-in proposal, in behalf of the Illinois Office of Attorney General.
79. *Petition of Pennsylvania-American Water Company for Approval to Implement a Tariff Supplement Revising the Distribution System Improvement Charge*, Pennsylvania Public Utility Commission, Docket No. P-00062241. 2007. Concerning the reasonableness of a water utility's proposal to increase the cap on a statutorily authorized distribution system surcharge, on behalf of the Pennsylvania Office of Consumer Advocate.
80. *Adjustment of the Rates of Kentucky-American Water Company*, Kentucky Public Service Commission, Case No. 2007-00143. 2007. Concerning rate design and cost of service, on behalf of the Kentucky Office of Attorney General.
81. *Application of Kentucky-American Water Company for a Certificate of Convenience and Necessity Authorizing the Construction of Kentucky River Station II, Associated Facilities and Transmission Main*, Kentucky Public Service Commission, Case No. 2007-00134. 2007. Concerning the life-cycle costs of a planned water supply source and the imposition of conditions on the construction of that project, on behalf of the Kentucky Office of Attorney General.
82. *Pa. Public Utility Commission v. Pennsylvania-American Water Company*, Pennsylvania Public Utility Commission, Docket No. R-00072229. 2007. Concerning rate design and cost of service, on behalf of the Pennsylvania Office of Consumer Advocate.

83. *Illinois-American Water Company Application for Approval of its Annual Reconciliation of Purchased Water and Purchased Sewage Treatment Surcharges*, Illinois Commerce Commission, Docket No. 07-0195. 2007. Concerning the reconciliation of purchased water and sewer charges, on behalf of the Illinois Office of Attorney General.
84. *In the Matter of the Application of Aqua Ohio, Inc. to Increase Its Rates for Water Service Provided In the Lake Erie Division*, Public Utilities Commission of Ohio, Case No.07-0564-WW-AIR. 2007. Concerning rate design and cost of service, on behalf of the Office of the Ohio Consumers' Counsel.
85. *Pa. Public Utility Commission v. Aqua Pennsylvania Inc.*, Pennsylvania Public Utility Commission, Docket No. R-00072711. 2008. Concerning rate design, on behalf of the Masthope Property Owners Council.
86. *Illinois-American Water Company Proposed increase in water and sewer rates*, Illinois Commerce Commission, Docket No. 07-0507. 2008. Concerning rate design and demand studies, on behalf of the Illinois Office of Attorney General.
87. *Central Illinois Light Company, d/b/a AmerenCILCO; Central Illinois Public Service Company, d/b/a AmerenCIPS; Illinois Power Company, d/b/a AmerenIP: Proposed general increase in rates for electric delivery service*, Illinois Commerce Commission Docket Nos. 07-0585, 07-0586, 07-0587. 2008. Concerning rate design and cost of service studies, on behalf of the Illinois Office of Attorney General.
88. *Commonwealth Edison Company: Proposed general increase in electric rates*, Illinois Commerce Commission Docket No. 07-0566. 2008. Concerning rate design and cost of service studies, on behalf of the Illinois Office of Attorney General.
89. *In the Matter of Application of Ohio American Water Co. to Increase Its Rates*, Public Utilities Commission of Ohio, Case No. 07-1112-WS-AIR. 2008. Concerning rate design and cost of service, on behalf of the Office of the Ohio Consumers' Counsel.
90. *In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Authority to Increase Rates for its Gas Service*, Public Utilities Commission of Ohio, Case Nos. 07-829-GA-AIR, et al. 2008. Concerning the need for, and structure of, an accelerated infrastructure replacement program and rate surcharge, on behalf of the Office of the Ohio Consumers' Counsel.
91. *Pa. Public Utility Commission v. Pennsylvania American Water Company*, Pennsylvania Public Utility Commission, Docket No. R-2008-2032689. 2008. Concerning rate design, cost of service study, and other tariff issues, on behalf of the Pennsylvania Office of Consumer Advocate.
92. *Pa. Public Utility Commission v. York Water Company*, Pennsylvania Public Utility Commission, Docket No. R-2008-2023067. 2008. Concerning rate design, cost of service study, and other tariff issues, on behalf of the Pennsylvania Office of Consumer Advocate.
93. *Northern Illinois Gas Company d/b/a Nicor Gas Company*, Illinois Commerce Commission, Docket No. 08-0363. 2008. Concerning rate design, cost of service, and automatic rate adjustments, on behalf of the Illinois Office of Attorney General.

94. *West Virginia American Water Company*, West Virginia Public Service Commission, Case No. 08-0900-W-42T. 2008. Concerning affiliated interest charges and relationships, on behalf of the Consumer Advocate Division of the Public Service Commission of West Virginia.
95. *Illinois-American Water Company Application for Approval of its Annual Reconciliation of Purchased Water and Purchased Sewage Treatment Surcharges*, Illinois Commerce Commission, Docket No. 08-0218. 2008. Concerning the reconciliation of purchased water and sewer charges, on behalf of the Illinois Office of Attorney General.
96. *In the Matter of Application of Duke Energy Ohio, Inc. for an Increase in Electric Rates*, Public Utilities Commission of Ohio, Case No. 08-0709-EL-AIR. 2009. Concerning rate design and cost of service, on behalf of the Office of the Ohio Consumers' Counsel.
97. *The Peoples Gas Light and Coke Company and North Shore Gas Company Proposed General Increase in Rates for Gas Service*, Illinois Commerce Commission, Docket Nos. 09-0166 and 09-0167. 2009. Concerning rate design and automatic rate adjustments on behalf of the Illinois Office of Attorney General, Citizens Utility Board, and City of Chicago.
98. *Illinois-American Water Company Proposed Increase in Water and Sewer Rates*, Illinois Commerce Commission, Docket No. 09-0319. 2009. Concerning rate design and cost of service on behalf of the Illinois Office of Attorney General and Citizens Utility Board.
99. *Pa. Public Utility Commission v. Aqua Pennsylvania Inc.*, Pennsylvania Public Utility Commission, Docket No. R-2009-2132019. 2010. Concerning rate design, cost of service, and automatic adjustment tariffs, on behalf of the Pennsylvania Office of Consumer Advocate.
100. *Apple Canyon Utility Company and Lake Wildwood Utilities Corporation Proposed General Increases in Water Rates*, Illinois Commerce Commission, Docket Nos. 09-0548 and 09-0549. 2010. Concerning parent-company charges, quality of service, and other matters, on behalf of Apple Canyon Lake Property Owners' Association and Lake Wildwood Association, Inc.
101. *Application of Aquarion Water Company of Connecticut to Amend its Rate Schedules*, Connecticut Department of Public Utility Control, Docket No. 10-02-13. 2010. Concerning rate design, proof of revenues, and other tariff issues, on behalf of the Connecticut Office of Consumer Counsel.
102. *Illinois-American Water Company Annual Reconciliation Of Purchased Water and Sewage Treatment Surcharges*, Illinois Commerce Commission, Docket No. 09-0151. 2010. Concerning the reconciliation of purchased water and sewer charges, on behalf of the Illinois Office of Attorney General.
103. *Pa. Public Utility Commission v. Pennsylvania-American Water Co.*, Pennsylvania Public Utility Commission, Docket Nos. R-2010-2166212, et al. 2010. Concerning rate design and cost of service study for four wastewater utility districts, on behalf of the Pennsylvania Office of Consumer Advocate.
104. *Central Illinois Light Company d/b/a AmerenCILCO, Central Illinois Public Service Company d/b/a AmerenCIPS, Illinois Power Company d/b/a AmerenIP Petition for accounting order*, Illinois Commerce Commission, Docket No. 10-0517. 2010. Concerning ratemaking procedures for a multi-district electric and natural gas utility, on behalf of the Illinois Office of Attorney General.

105. *Commonwealth Edison Company Petition for General Increase in Delivery Service Rates*, Illinois Commerce Commission Docket No. 10-0467. 2010. Concerning rate design and cost of service study, on behalf of the Illinois Office of Attorney General.
106. *Pa. Public Utility Commission v. City of Lancaster Bureau of Water*, Pennsylvania Public Utility Commission, Docket No. R-2010-2179103. 2010. Concerning rate design, cost of service, and cost allocation, on behalf of the Pennsylvania Office of Consumer Advocate.
107. *Application of Yankee Gas Services Company for Amended Rate Schedules*, Connecticut Department of Public Utility Control, Docket No. 10-12-02. 2011. Concerning rate design and cost of service for a natural gas utility, on behalf of the Connecticut Office of Consumers' Counsel.
108. *California-American Water Company*, California Public Utilities Commission, Application 10-07-007. 2011. Concerning rate design and cost of service for multiple water-utility service areas, on behalf of The Utility Reform Network.
109. *Little Washington Wastewater Company, Inc., Masthope Wastewater Division*, Pennsylvania Public Utility Commission Docket No. R-2010-2207833. 2011. Concerning rate design and various revenue requirements issues, on behalf of the Masthope Property Owners Council.
110. *In the matter of Pittsfield Aqueduct Company, Inc.*, New Hampshire Public Utilities Commission Case No. DW 10-090. 2011. Concerning rate design and cost of service on behalf of the New Hampshire Office of the Consumer Advocate.
111. *In the matters of Pennichuck Water Works, Inc. Permanent Rate Case and Petition for Approval of Special Contract with Anheuser-Busch, Inc.*, New Hampshire Public Utilities Commission Case Nos. DW 10-091 and DW 11-014. 2011. Concerning rate design, cost of service, and contract interpretation on behalf of the New Hampshire Office of the Consumer Advocate.
112. *Artesian Water Co., Inc. v. Chester Water Authority*, U.S. District Court for the Eastern District of Pennsylvania Case No. 10-CV-07453-JP. 2011. Concerning cost of service, ratemaking methods, and contract interpretation on behalf of Chester Water Authority.
113. *North Shore Gas Company and The Peoples Gas Light and Coke Company Proposed General Increases in Rates for Gas Service*, Illinois Commerce Commission, Docket Nos. 11-0280 and 11-0281. 2011. Concerning rate design and cost of service on behalf of the Illinois Office of Attorney General, the Citizens Utility Board, and the City of Chicago.
114. *Ameren Illinois Company: Proposed general increase in electric delivery service rates and gas delivery service rates*, Illinois Commerce Commission, Docket Nos. 11-0279 and 11-0282. 2011. Concerning rate design and cost of service for natural gas and electric distribution service, on behalf of the Illinois Office of Attorney General and the Citizens Utility Board.
115. *Pa. Public Utility Commission v. Pennsylvania-American Water Co.*, Pennsylvania Public Utility Commission, Docket No. R-2011-2232243. 2011. Concerning rate design, cost of service, sales forecast, and automatic rate adjustments on behalf of the Pennsylvania Office of Consumer Advocate.
116. *Aqua Illinois, Inc. Proposed General Increase in Water and Sewer Rates*, Illinois Commerce Commission, Docket No. 11-0436. 2011. Concerning rate design and cost of service on behalf of the

Illinois Office of Attorney General.

117. *City of Nashua Acquisition of Pennichuck Corporation*, New Hampshire Public Utilities Commission, Docket No. DW 11-026. 2011. Concerning the proposed acquisition of an investor-owned utility holding company by a municipality, including appropriate ratemaking methodologies, on behalf of the New Hampshire Office of Consumer Advocate.
118. *An Application by Heritage Gas Limited for the Approval of a Schedule of Rates, Tolls and Charges*, Nova Scotia Utility and Review Board, Case NSUARB-NG-HG-R-11. 2011. Concerning rate design and cost of service, on behalf of the Nova Scotia Consumer Advocate.
119. *An Application of Halifax Regional Water Commission for Approval of a Cost of Service and Rate Design Methodology*, Nova Scotia Utility and Review Board, Case NSUARB-W-HRWC-R-11. 2011. Concerning rate design and cost of service, on behalf of the Nova Scotia Consumer Advocate.
120. *National Grid USA and Liberty Energy Utilities Corp.*, New Hampshire Public Utilities Commission, Docket No. DG 11-040. 2011. Concerning the costs and benefits of a proposed merger and related conditions, on behalf of the New Hampshire Office of Consumer Advocate.
121. *Great Northern Utilities, Inc., et al.*, Illinois Commerce Commission, Docket Nos. 11-0059, et al. 2012. Concerning options for mitigating rate impacts and consolidating small water and wastewater utilities for ratemaking purposes, on behalf of the Illinois Office of Attorney General.
122. *Pa. Public Utility Commission v. Aqua Pennsylvania, Inc.*, Pennsylvania Public Utility Commission, Docket No. R-2011-2267958. 2012. Concerning rate design, cost of service, and automatic rate adjustment mechanisms, on behalf of the Pennsylvania Office of Consumer Advocate.
123. *Golden State Water Company*, California Public Utilities Commission, Application 11-07-017. 2012. Concerning rate design and quality of service, on behalf of The Utility Reform Network.
124. *Golden Heart Utilities, Inc. and College Utilities Corporation*, Regulatory Commission of Alaska, Case Nos. U-11-77 and U-11-78. 2012. Concerning rate design and cost of service, on behalf of the Alaska Office of the Attorney General.
125. *Illinois-American Water Company*, Illinois Commerce Commission, Docket No. 11-0767. 2012. Concerning rate design, cost of service, and automatic rate adjustment mechanisms, on behalf of the Illinois Office of Attorney General.
126. *Application of Tidewater Utilities, Inc., for a General Rate Increase in Water Base Rates and Tariff Revisions*, Delaware Public Service Commission, Docket No. 11-397. 2012. Concerning rate design and cost of service study, on behalf of the Staff of the Delaware Public Service Commission.
127. *In the Matter of the Philadelphia Water Department's Proposed Increase in Rates for Water and Wastewater Utility Services*, Philadelphia Water Commissioner, FY 2013-2016. 2012. Concerning rate design and related issues for storm water service, on behalf of Citizens for Pennsylvania's Future.
128. *Corix Utilities (Illinois) LLC, Hydro Star LLC, and Utilities Inc. Joint Application for Approval of a Proposed Reorganization*, Illinois Commerce Commission, Docket No. 12-0279. 2012. Concerning merger-related synergy savings and appropriate ratemaking treatment of the same, on behalf of the

Illinois Office of Attorney General.

129. *North Shore Gas Company and The Peoples Gas Light and Coke Company*, Illinois Commerce Commission, Docket Nos. 12-0511 and 12-0512. 2012. Concerning rate design, cost of service study, and automatic rate adjustment tariff on behalf of the Illinois Office of Attorney General.
130. *Pa. Public Utility Commission v. City of Lancaster Sewer Fund*, Pennsylvania Public Utility Commission, Docket No. R-2012-2310366. 2012. Concerning rate design, cost of service, and cost allocation, on behalf of the Pennsylvania Office of Consumer Advocate.
131. *Aquarion Water Company of New Hampshire*, New Hampshire Public Utilities Commission, Docket No. DW 12-085. 2013. Concerning tariff issues, including an automatic adjustment clause for infrastructure improvement, on behalf of the New Hampshire Office of Consumer Advocate.
132. *In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in Electric Distribution Rates*, Public Utilities Commission of Ohio, Case No. 12-1682-EL-AIR, et al. 2013. Concerning rate design and tariff issues, on behalf of the Office of the Ohio Consumers' Counsel.
133. *In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in Natural Gas Distribution Rates*, Public Utilities Commission of Ohio, Case No. 12-1685-GA-AIR, et al. 2013. Concerning cost-of-service study, rate design, and tariff issues, on behalf of the Office of the Ohio Consumers' Counsel.
134. *In the Matter of the Application of The Dayton Power and Light Company to Establish a Standard Service Offer in the Form of an Electric Security Plan*, Public Utilities Commission of Ohio, Case No. 12-426-EL-SSO, et al. 2013. Concerning rate design, on behalf of the Office of the Ohio Consumers' Counsel.
135. *Application of the Halifax Regional Water Commission, for Approval of Amendments to its Schedule of Rates and Charges and Schedule of Rules and Regulations for the delivery of water, public and private fire protection, wastewater and stormwater services*, Nova Scotia Utility and Review Board, Matter No. M05463, 2013. Concerning rate design, cost-of-service study, and miscellaneous tariff provisions, on behalf of the Consumer Advocate of Nova Scotia.
136. *California Water Service Co. General Rate Case Application*, California Public Utilities Commission, Docket No. A.12-07-007. 2013. Concerning rate design, phase-in plans, low-income programs, and other tariff issues, on behalf of The Utility Reform Network.
137. *Application of The United Illuminating Company to Amend its Rate Schedules*, Connecticut Public Utility Regulatory Authority, Docket No. 13-01-19. 2013. Concerning sales forecast, rate design, and other tariff issues, on behalf of the Connecticut Office of Consumer Counsel.
138. *Application of Aquarion Water Company of Connecticut to Amend its Rate Schedules*, Connecticut Public Utility Regulatory Authority, Docket No. 13-02-20. 2013. Concerning sales forecast and rate design on behalf of the Connecticut Office of Consumer Counsel.
139. *Ameren Illinois Company, Proposed General Increase in Natural Gas Delivery Service Rates*, Illinois Commerce Commission, Docket No. 13-0192. 2013. Concerning rate design and revenue allocation, on behalf of the Illinois Office of Attorney General and Citizens Utility Board.



140. *Commonwealth Edison Company, Tariff filing to present the Illinois Commerce Commission with an opportunity to consider revenue neutral tariff changes related to rate design*, Docket No. 13-0387. 2013. Concerning rate design and cost of service study issues, on behalf of the Illinois Office of Attorney General.
141. *In the Matter of the Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service*, District of Columbia Public Service Commission, Formal Case No. 1103. 2013. Concerning rate design, revenue allocation, and cost-of-service study issues, on behalf of the District of Columbia Office of Peoples' Counsel.
142. *Pa. Public Utility Commission v. Pennsylvania-American Water Co.*, Pennsylvania Public Utility Commission, Docket No. R-2013-2355276. 2013. Concerning rate design, revenue allocation, and regulatory policy, on behalf of the Pennsylvania Office of Consumer Advocate.
143. *In the Matter of the Revenue Requirement and Transmission Tariff Designated as TA364-8 filed by Chugach Electric Association, Inc.*, Regulatory Commission of Alaska, U-13-007. 2013. Concerning rate design and cost-of-service study issues, on behalf of the Alaska Office of the Attorney General.
144. *Ameren Illinois Company: Tariff filing to present the Illinois Commerce Commission with an opportunity to consider revenue neutral tariff changes related to rate design*, Docket No. 13-0476. 2013. Concerning rate design and cost of service study issues, on behalf of the Illinois Office of Attorney General.
145. *Pa. Public Utility Commission v. City of Bethlehem Bureau of Water*, Pennsylvania Public Utility Commission, Docket No. R-2013-2390244. 2014. Concerning rate design, cost of service study, and revenue allocation on behalf of the Pennsylvania Office of Consumer Advocate.
146. *In the Matter of the Tariff Revision Designated as TA332-121 filed by the Municipality of Anchorage d/b/a Municipal Light and Power Department*, Regulatory Commission of Alaska, U-13-184. 2014. Concerning rate design and cost-of-service study issues, on behalf of the Alaska Office of the Attorney General.
147. *Pa. Public Utility Commission v. Pike County Light and Power Co. - Gas*, Pennsylvania Public Utility Commission, Docket No. R-2013-2397353. 2014. Concerning rate design and revenue allocation on behalf of the Pennsylvania Office of Consumer Advocate.
148. *Pa. Public Utility Commission v. Pike County Light and Power Co. - Electric*, Pennsylvania Public Utility Commission, Docket No. R-2013-2397237. 2014. Concerning rate design, cost of service study, and revenue allocation on behalf of the Pennsylvania Office of Consumer Advocate.
149. *The Peoples Gas Light and Coke Company North Shore Gas Company Proposed General Increase In Rates for Gas Service*, Illinois Commerce Commission, Docket Nos. 14-0224 and 14-0225. 2014. Concerning rate design on behalf of the Illinois Office of the Attorney General and the Environmental Law and Policy Center.
150. *Apple Valley Ranchos Water Company*, California Public Utilities Commission, Docket No. A.14-01-002. 2014. Concerning rate design and automatic rate adjustment mechanisms on behalf of the Town of Apple Valley.

151. *Application by Heritage Gas Limited for Approval to Amend its Franchise Area*, Nova Scotia Utility and Review Board, Matter No. M06271. 2014. Concerning criteria, terms, and conditions for expanding a utility's service area and using transported compressed natural gas to serve small retail customers, on behalf of the Nova Scotia Consumer Advocate.
152. *Notice of Intent of Entergy Mississippi, Inc. to Modernize Rates to Support Economic Development, Power Procurement, and Continued Investment*, Mississippi Public Service Commission Docket No. 2014-UN-132. 2014. Concerning rate design and tariff issues, on behalf of the Mississippi Public Utilities Staff.
153. *Pa. Public Utility Commission v. City of Lancaster Bureau of Water*, Pennsylvania Public Utility Commission, Docket No. R-2014-2418872. 2014. Concerning rate design, cost of service study, and revenue allocation on behalf of the Pennsylvania Office of Consumer Advocate.
154. *Pa. Public Utility Commission v. Borough of Hanover Municipal Water Works*, Pennsylvania Public Utility Commission, Docket No. R-2014-2428304. 2014. Concerning rate design, cost of service study, and revenue allocation on behalf of the Pennsylvania Office of Consumer Advocate.
155. *Investigation of Commonwealth Edison Company's Cost of Service for Low-Use Customers In Each Residential Class*, Illinois Commerce Commission, Docket No. 14-0384. 2014. Concerning rate design on behalf of the Illinois Office of Attorney General.
156. *Application of the Halifax Regional Water Commission, for Approval of its Schedule of Rates and Charges and Schedule of Rules and Regulations for the Provision of Water, Public and Private Fire Protection, Wastewater and Stormwater Services*, Nova Scotia Utility and Review Board, Matter No. M06540. 2015. Concerning rate design, cost of service study, and tariff issues on behalf of the Nova Scotia Consumer Advocate.
157. *Testimony concerning organization and regulation of Philadelphia Gas Works*, Philadelphia City Council's Special Committee on Energy Opportunities. 2015.
158. *Testimony concerning proposed telecommunications legislation*, Maine Joint Standing Committee on Energy, Utilities, and Technology. 2015.
159. *Pa. Public Utility Commission v. United Water Pennsylvania, Inc.*, Pennsylvania Public Utility Commission, Docket No. R-2015-2462723. 2015. Concerning rate design, cost of service study, and revenue allocation on behalf of the Pennsylvania Office of Consumer Advocate.
160. *Ameren Illinois Company Proposed General Increase in Gas Delivery Service Rates*, Illinois Commerce Commission, Docket No. 15-0142. 2015. Concerning rate design on behalf of the Illinois Office of Attorney General.
161. *Maine Natural Gas Company Request for Multi-Year Rate Plan*, Maine Public Utilities Commission, Docket No. 2015-00005. 2015. Concerning rate design and automatic rate adjustment tariffs on behalf of the Maine Office of the Public Advocate.
162. *Application of Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company for Authority to Provide for a Standard Service Offer*, Public Utilities Commission of Ohio, Case No. 14-1297-EL-SSO. 2015. Concerning rate design and proposed rate discounts on behalf

of the Office of the Ohio Consumers' Counsel.

163. *An Application of the Halifax Regional Water Commission, for approval of revisions to its Cost of Service Manual and Rate Design for Stormwater Service*, Nova Scotia Utility and Review Board, Matter No. M07147. 2016. Concerning stormwater rate design and cost of service, on behalf of the Nova Scotia Consumer Advocate.
164. *In The Matter Of An Application By Heritage Gas Limited For Enhancement To Its Existing Residential Retro-Fit Assistance Fund*, Nova Scotia Utility and Review Board, Matter No. M07146. 2016. Concerning costs and benefits associated with utility system expansion, on behalf of the Nova Scotia Consumer Advocate.
165. *In the Matter of the Application of UNS Electric, Inc. for the Establishment of Just and Reasonable Rates and Charges*, Arizona Corporation Commission, Docket No. E-04204A-15-0142. 2016. Concerning rate design and residential demand charges on behalf of Arizona Utility Ratepayer Alliance.
166. *In the Matter of Application of Water Service Corporation of Kentucky for a General Adjustment in Existing Rates*, Kentucky Public Service Commission, Case No. 2015-00382. 2016. Concerning rate design and service area consolidation on behalf of the Kentucky Office of the Attorney General.
167. *Massachusetts Electric Company And Nantucket Electric Company*, Massachusetts Department of Public Utilities, Docket No. DPU 15-155. 2016. Concerning rate design and cost-of-service studies on behalf of the Massachusetts Office of Attorney General.
168. *In the Matter of Abenaki Water Company*, New Hampshire Public Utilities Commission, Docket No. DW 15-199. 2016. Concerning rate design on behalf of the New Hampshire Office of the Consumer Advocate.
169. *In the Matter of an Application by Heritage Gas Limited for Approval of its Customer Retention Program*, Nova Scotia Utility and Review Board Matter No. M07346. 2016. Concerning a regulatory response to competition and potential business failure on behalf of the Nova Scotia Consumer Advocate.
170. *Joint Application of Pennsylvania-American Water Company and the Sewer Authority of the City of Scranton*, Pennsylvania Public Utility Commission Docket No. A-2016-2537209. 2016. Concerning the lawfulness, costs and benefits, and ratemaking treatment of a proposed acquisition of a combined wastewater and storm water utility on behalf of the Pennsylvania Office of Consumer Advocate.
171. *Application of The United Illuminating Company to Amend its Rate Schedules*, Connecticut Public Utility Regulatory Authority Docket No. 16-06-04. 2016. Concerning rate design, cost-of-service study, and other tariff issues on behalf of the Connecticut Office of Consumer Counsel.
172. *Ameren Illinois Company Tariff filing to present the Illinois Commerce Commission with an opportunity to consider revenue neutral tariff changes related to rate design*, Illinois Commerce Commission Docket No. 16-0387. 2016. Concerning rate design and cost-of-service study on behalf of the Illinois Office of the Attorney General.
173. *Unitil Energy Systems, Inc.*, New Hampshire Public Utilities Commission Docket No. 16-384. 2016. Concerning rate design and cost-of-service study on behalf of the New Hampshire Office of Consumer

Advocate.

174. *Liberty Utilities (Granite State Electric) Corp.*, New Hampshire Public Utilities Commission Docket No. 16-383. 2016. Concerning rate design and cost-of-service study on behalf of the New Hampshire Office of Consumer Advocate.
175. *Arizona Public Service Co.*, Arizona Corporation Commission Docket No. E-01345A-16-0123. 2017. Concerning rate design and cost-of-service study on behalf of the Arizona Utility Ratepayer Alliance.
176. *Commonwealth Edison Company, Tariff filing to present the Illinois Commerce Commission with an opportunity to consider revenue neutral tariff changes related to rate design*, Illinois Commerce Commission Docket No. 17-0049. 2017. Concerning rate design and cost of service study issues, on behalf of the Illinois Office of Attorney General.
177. *NSTAR Electric Company and Western Massachusetts Electric Company*, Massachusetts Department of Public Utilities Docket No. D.P.U. 17-05. 2017. Concerning rate design and cost of service study issues, on behalf of the Massachusetts Office of Attorney General.
178. *In the Matter of the Tariff Revision Designated as TA857-2 Filed by Alaska Power Company*, Regulatory Commission of Alaska No. U-16-078. 2017. Concerning rate design and cost of service study issues on behalf of the Alaska Office of the Attorney General.
179. *In the Matter of the Application of Minnesota Power For Authority to Increase Rates for Electric Utility Service in Minnesota*, Minnesota Public Utilities Commission Docket No. E015/GR-16-664. 2017. Concerning rate design and cost of service study issues on behalf of AARP.
180. *Pennsylvania Public Utility Commission v. Pennsylvania-American Water Company*, Pennsylvania Public Utility Commission, Docket No. R-2017-2595853. 2017. Concerning rate design, cost of service, and policy issues, on behalf of the Pennsylvania Office of Consumer Advocate.
181. *Aqua Illinois, Inc. Proposed Rate Increases for Water and Sewer Services*, Illinois Commerce Commission, Docket No. 17-0259. 2017. Concerning rate design and single-tariff pricing, on behalf of the Illinois Office of Attorney General.
182. *Petition of Pennsylvania-American Water Company for Approval of Tariff Changes and Accounting and Rate Treatment Related to Replacement of Lead Customer-Owned Service Pipes*, Pennsylvania Public Utility Commission, Docket No. P-2017-2606100. 2017. Concerning public policy and ratemaking issues associated with the replacement of customer-owned lead service lines, on behalf of the Pennsylvania Office of Consumer Advocate.
183. *In the Matter of Application and Notice of Change in Natural Gas Rates of Montana-Dakota Utilities Co.*, North Dakota Public Service Commission, Case No. PU-17-295. 2017. Concerning rate design and cost of service study issues, on behalf of AARP.
184. *Aqua Illinois, Inc. Petition for the Issuance of a Certificate of Public Convenience and Necessity to Operate a Water and Wastewater System in the Village of Peotone*, Illinois Commerce Commission, Docket No. 17-0314. 2018. Concerning rate consolidation and rate design, on behalf of the Illinois Office of Attorney General.

185. *Application Of The Connecticut Light and Power Company d/b/a Eversource Energy to Amend Its Rate Schedules*, Connecticut Public Utilities Regulatory Authority, Docket No. 17-10-46. 2018. Concerning rate design issues, on behalf of the Connecticut Office of Consumer Counsel.
186. *Application by Heritage Gas for Approval of a Long-Term Natural Gas Transportation Contract and Cost Recovery Mechanism*, Nova Scotia Utility and Review Board, Matter M08473. 2018. Concerning evaluation of costs, benefits, and risks of a long-term natural gas pipeline contract, on behalf of the Consumer Advocate of Nova Scotia.
187. *Boston Gas Company and Colonial Gas Company*, Massachusetts Department of Public Utilities, D.P.U. 17-170. 2018. Concerning class revenue allocation and rate design, on behalf of the Massachusetts Office of Attorney General.
188. *In the Matter of the Application of Maryland-American Water Company for Authority to Adjust its Existing Schedule of Tariffs and Rates*, Maryland Public Service Commission, Case No. 9487. 2018. Concerning cost-of-service study, on behalf of the Staff of the Maryland Public Service Commission.
189. *Joint Application and Petition of South Carolina Electric & Gas Company and Dominion Energy, Inc. for review and approval of a proposed business combination between SCANA Corporation and Dominion Energy, Inc., as may be required, and for a prudency determination regarding the abandonment of the V.C. Summer Units 2 & 3 Project and associated merger benefits and cost recovery plans*, South Carolina Public Service Commission, Docket No. 2017-370-E. 2018. Concerning regulatory policy, prudency of decision-making, and cost sharing, on behalf of AARP.

**OCA STATEMENT NO. 1**

**Schedule SJR-1**

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

**Data Request OCA-II-14:**

Reference: Transource Statement 3 (McGlynn), p. 21, lines 12-14.

- a. Please describe in detail what Mr. McGlynn means by the statement: "In determining the Change in Load Energy Payments, only zones that show a decrease will be considered in determining the Change in Load Energy Payments."
- b. 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?
- c. Specifically for the Independence Energy Project, did the modeling show any zones experiencing an increase in energy costs? If so, please identify each such zone, the amount of energy cost increase in the zone, and the total Change in Load Energy Payments for the Project (both including and excluding zones with cost increases).

**Response:**

- a. The quoted portion of Mr. McGlynn's testimony refers to the market efficiency process contained in PJM Manual 14B.
- b. \$10 Million.
- c. Yes. Please refer to OCA-II-14 Attachment 1.pdf for the requested information. This analysis indicated an overall reduction (i.e., netting the total of the transmission zones with cost increases minus the transmission zones with cost reductions) of approximately \$336 million as a result of Project 9A.

**Witness:** Paul McGlynn

Change in 15-Year Net Present Value of Net Load Payment  
Project 9A

PJM ZONE	(\$Millions)
AECO	33.55
AEP	-71.38
APS	-96.53
BGE	-218.19
COMED	-23.86
CONABCJK	-4.12
DAY	-6.54
DEOK	-11.25
DOM	-441.33
DPL	74.12
DUQ	-0.11
EKPC	-5.01
FE-ATSI	13.37
JCPL	91.25
LINDVFT	-63.83
METED	96.82
NEPTHVDC	5.82
O66HVDC	-15.16
PECO	178.95
PENELEC	34.15
PEPCO	-230.76
PLGRP	170.02
PSEG	149.65
RECO	3.97
Total PJM Change	-336.40
Zones that decrease	-1188.07
Zones that increase	851.67



**OCA STATEMENT NO. 1**

**Schedule SJR-2**

**Change in Net Load Payments ( $\Delta$  NLP) Sept. 2017 Re-evaluation  
 (negative numbers are a benefit; positive numbers are a detriment)**

<u>PJM Zone</u>	<u><math>\Delta</math> NLP</u>
AECO	\$ 15,327,708
AEP	(52,089,668)
APS	(85,590,533)
BGE	(44,930,925)
COMED	(11,700,983)
DAY	(5,378,001)
DEOK	(6,824,715)
DOM	(274,155,876)
DPL	33,704,983
DUQ	(2,844,756)
EKPC	(4,184,839)
FE-ATSI	260,370
JCPL	29,886,093
LINDVFT	3,797,655
METED	22,005,619
NEPTHVDC	7,480,044
O66HVDC	3,131,553
PECO	85,911,567
PENELEC	13,178,628
PEPCO	(123,784,114)
PLGRP	52,483,339
PSEG	57,392,516
RECO	2,007,128
zPJMIMP	-
Total	\$ (284,917,209)
$\Sigma$ Benefits	\$ (611,484,411)
$\Sigma$ Costs	\$ 326,567,201

Source: Transource response to OCA 6-2 attachment, NLP Analysis tab

**OCA STATEMENT NO. 1**

**Schedule SJR-3**

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East & West Projects  
Docket Nos. A-2017-2640195 and A-2017-2640200**

**Interrogatories of the Office of Consumer Advocate  
Set XXII**

**Data Request 02:**

The following questions are directed to Mr. McGlynn/PJM. These questions should be viewed as a continuing request to provide updated responses (with the exception of Question 4) thereto as soon as they are available, but in no event later than every 60 days.

Please reference OCA-II-14(c) and the responses thereto. Please provide a current, updated chart in the same format and containing the same information as provided in OCA-II-14 Attachment 1.

Response:

Please refer to the Company's response to OCA-XXII-01. Company will supplement its response accordingly upon PJM completion of the Benefit/Cost ratio re-evaluation.

**Supplemental Response (September 19, 2018):**

Please see Attachment OCA-XXII-02-Supplemental-Sep-13-2018.

**Witness:** Paul F. McGlynn

Change in 15-Year Net Present Value of Net Load Payment  
Project 9A

PJM ZONE	(\$million)
AECO	17.90
AEP	5.32
APS	-4.74
BGE	-158.44
COMED	67.47
DAY	1.67
DEOK	17.19
DOM	-382.05
DPL	30.42
DUQ	4.23
EKPC	-0.36
FE-ATSI	55.32
JCPL	52.66
LINDVFT	5.32
METED	62.15
NEPTHVDC	9.97
O66HVDC	5.11
PECO	83.00
PENELEC	31.63
PEPCO	-161.71
PLGRP	164.91
PSEG	72.97
RECO	2.99
Total PJM Change	-17.05
Zones that decrease	-707.29
Zones that increase	690.24

Change in 15-Year Net Present Value of Net Load Payment  
Project 9A

PJM ZONE		NLP NPV (\$)
AECO	\$	17,903,639
AEP	\$	5,318,294
APS	\$	(4,738,473)
BGE	\$	(158,435,444)
COMED	\$	67,467,567
DAY	\$	1,670,667
DEOK	\$	17,188,314
DOM	\$	(382,049,485)
DPL	\$	30,415,129
DUQ	\$	4,232,346
EKPC	\$	(357,204)
FE-ATSI	\$	55,324,876
JCPL	\$	52,659,515
LINDVFT	\$	5,322,364
METED	\$	62,147,589
NEPTHVDC	\$	9,969,764
O66HVDC	\$	5,107,620
PECO	\$	83,000,950
PENELEC	\$	31,631,372
PEPCO	\$	(161,710,391)
PLGRP	\$	164,913,851
PSEG	\$	72,968,290
RECO	\$	2,994,278
Total PJM Change	\$	(17,054,570)
Zones that decrease	\$	(707,290,998)
Zones that increase	\$	690,236,427

**OCA STATEMENT NO. 1**

**Schedule SJR-4**

**Components of IEC Project Cost Estimates, by Transmission Owner**

Project Name	Transmission Owner	Upgrade ID	Description	Latest Cost Estimate (\$M)
201415_1-9A	Transource	b2743.1	Tap the Conemaugh - Hunterstown 500 kV line & create new Rice 500 kV & 230 kV stations. Install two 500/230 kV transformers, operated together.	\$ 39.81
201415_1-9A	PENELEC	b2743.2	Tie in new Rice substation to Conemaugh-Hunterstown 500 kV	\$ 6.11
201415_1-9A	PENELEC	b2743.3	Upgrade terminal equipment at Conemaugh 500 kV: on the Conemaugh - Hunterstown 500 kV circuit	\$ 0.20
201415_1-9A	ME	b2743.4	Upgrade terminal equipment at Hunterstown 500 kV: on the Conemaugh - Hunterstown 500 kV circuit	\$ 0.20
201415_1-9A	Transource	b2743.5	Build new 230 kV double circuit line between Rice and Ringgold 230 kV, operated as a single circuit.	\$ 72.88
201415_1-9A	APS	b2743.6	Reconfigure the Ringgold 230 kV substation to double bus double breaker scheme	\$ 7.87
201415_1-9A	APS	b2743.6.1	Replace the two Ringgold 230/138 kV transformers	\$ 6.26
201415_1-9A	APS	b2743.7	Rebuild/Reconductor the Ringgold - Catoclin 138 kV circuit and upgrade terminal equipment on both ends	\$ 47.22
201415_1-9A	APS	b2743.8	Replace Ringgold Substation 138 kV breakers '138 BUS TIE' and 'RCMO' with 40 kA breakers	\$ 0.71
201415_1-9A	Transource	b2752.1	Tap the Peach Bottom – TMI 500 kV line & create new Furnace Run 500 kV & 230 kV stations. Install two 500/230 kV transformers, operated together.	\$ 44.66
201415_1-9A	PECO	b2752.2	Tie in new Furnace Run substation to Peach Bottom-TMI 500 kV	\$ 5.50
201415_1-9A	PECO	b2752.3	Upgrade terminal equipment and required relay communication at Peach Bottom 500 kV: on the Peach Bottom - TMI 500 kV circuit	\$ 2.00
201415_1-9A	ME	b2752.4	Upgrade terminal equipment and required relay communication at TMI 500 kV: on the Peach Bottom - TMI 500 kV circuit	\$ 2.00
201415_1-9A	Transource	b2752.5	Build new 230 kV double circuit line between Furnace Run and Conastone 230 kV, operated as a single circuit.	\$ 39.72
201415_1-9A	BGE	b2752.6	Conastone 230 kV substation tie-in work (install a new circuit breaker at Conastone 230 kV and upgrade any required terminal equipment to terminate the new circuit)	\$ 4.12
201415_1-9A	BGE	b2752.7	Reconductor/Rebuild the two Conastone - Northwest 230 kV lines and upgrade terminal equipment on both ends	\$ 45.88
201415_1-9A	BGE	b2752.8	Replace the Conaston 230kV '2322 B5' breaker with a 63kA breaker	\$ 0.54
201415_1-9A	BGE	b2752.9	Replace the Conaston 230kV '2322 B6' breaker with a 63kA breaker	\$ 0.54
Total				\$ 326.21

**Cost Summary by Transmission Owner**

APS	Allegheny Power System	\$ 62.06
BGE	Baltimore Gas & Electric	51.07
ME	Metropolitan Edison (MAIT)	2.20
PECO	PECO Electric	7.50
PENELEC	Pennsylvania Electric (MAIT)	6.31
Transource	Transource	197.07
	Add Transource other capital costs (difference between Transource estimate of \$230 million and amount shown above)	32.93
	<b>Total project cost (does not fully reflect 9/13/2018 TEAC update)</b>	<b>\$ 359.14</b>

Source: PJM Transmission Cost Information Center, file: tcic.xlsm (last updated 3/15/2018)



**OCA STATEMENT NO. 1**

**Schedule SJR-5**

**Allocation of Project Costs and Benefits to PJM Zones - Sept. 2018**  
**(negative numbers are a benefit; positive numbers are a cost)**  
**(Dollars are millions)**

Project cost PVRR estimate as of 9/13/2018:                   \$                   498

<u>PJM Zone</u>	<u>% of Project Cost</u>	<u>PVRR \$</u>	<u>NPV of ΔNLP</u>	<u>Net Cost (Benefit)</u>
AEP	6.46%	\$ 32.18	\$ 5.32	\$ 37.50
APS	8.73%	43.48	(4.74)	38.74
BGE	19.73%	98.27	(158.44)	(60.17)
COMED	2.16%	10.76	67.47	78.23
CONED	0.06%	0.30	-	0.30
DAY	0.59%	2.94	1.67	4.61
DEOK	1.02%	5.08	17.19	22.27
DOM	39.92%	198.83	(382.05)	(183.22)
DUQ	0.01%	0.05	4.23	4.28
EKPC	0.45%	2.24	(0.36)	1.88
PEPCO	<u>20.87%</u>	<u>103.95</u>	<u>(161.71)</u>	<u>(57.76)</u>
<b>Total</b>	<b>100.00%</b>	<b>498.08</b>	<b>(611.41)</b>	<b>(113.33)</b>

Sources:

% of Project Cost from PJM TEAC Recommendations to the PJM Board (Staff Whitepaper) (Aug. 2, 2016), Attach. B, available at: <https://www.pjm.com/~media/committees-groups/committees/teac/20160811/20160811-board-whitepaper-august-2016.ashx>.

Project cost PVRR derived from 9/13/18 benefit (OCA XXII-2) and PJM stated benefit-cost ratio of 1.42.

NPV of ΔNLP from OCA XXII-2.

**OCA STATEMENT NO. 1**

**Schedule SJR-6**

**Summary of  $\Delta$ NLP for Pennsylvania Zones from Sept. 2016 and Sept. 2017 Estimates**  
**(negative numbers are a benefit; positive numbers are a detriment)**  
**(\$ x million)**

PA Zone	Sept. 2016 Estimated $\Delta$ NLP	Sept. 2017 Estimated $\Delta$ NLP	Sept. 2017 Estimated $\Delta$ NLP
APS	\$ (43.20)	\$ (38.30)	\$ (2.12)
DUQ	(0.11)	(2.84)	4.23
FE-ATSI	0.96	0.02	3.98
METED	96.82	22.01	62.15
PECO	178.95	85.91	83.00
PENELEC	34.15	13.18	31.63
PLGRP	170.02	52.48	164.91
Total	\$ 437.60	\$ 132.45	\$ 347.79

**Change in Net Load Payments ( $\Delta$  NLP) for Pennsylvania (PA) Based on Sept. 2016 Estimate  
 (negative numbers are a benefit; positive numbers are a detriment)**

PJM Zone	$\Delta$ NLP	% in PA	$\Delta$ NLP for PA
AECO	\$ 33,500,000	0.00%	\$ -
AEP	(71,380,000)	0.00%	-
APS	(96,530,000)	44.75%	(43,197,175)
BGE	(218,190,000)	0.00%	-
COMED	(23,860,000)	0.00%	-
CONABCJK	(4,120,000)	0.00%	-
DAY	(6,540,000)	0.00%	-
DEOK	(11,250,000)	0.00%	-
DOM	(441,330,000)	0.00%	-
DPL	74,120,000	0.00%	-
DUQ	(110,000)	100.00%	(110,000)
EKPC	(5,010,000)	0.00%	-
FE-ATSI	13,370,000	7.20%	962,640
JCPL	91,250,000	0.00%	-
LINDVFT	(63,830,000)	0.00%	-
METED	96,820,000	100.00%	96,820,000
NEPTHVDC	5,820,000	0.00%	-
O66HVDC	(15,160,000)	0.00%	-
PECO	178,950,000	100.00%	178,950,000
PENELEC	34,150,000	100.00%	34,150,000
PEPCO	(230,760,000)	0.00%	-
PLGRP	170,020,000	100.00%	170,020,000
PSEG	149,650,000	0.00%	-
RECO	3,970,000	0.00%	-
Total	\$ (336,450,000)		\$ 437,595,465
$\Sigma$ Benefits	\$ (1,188,070,000)		\$ (43,307,175)
$\Sigma$ Costs	\$ 851,620,000		\$ 480,902,640

Source: Transource response to OCA II-14 (Sch. SJR-1)

Notes:

PA portion of APS and FE-ATSI Zones calculated as the ratio of estimated 2018 summer peak demand in PA (from PJM, Pennsylvania State Infrastructure Report, May 2018) to estimated 2018 summer peak demand for the zone (from PJM Load Forecast Report, Jan. 2018):

	PA	Zone	Percent
APS	3,949	8,825	44.75%
FE-ATSI	932	12,952	7.20%

PLGRP is comprised of PPL and UGI, all of which is in PA

**Change in Net Load Payments ( $\Delta$  NLP) for Pennsylvania (PA) Based on Sept. 2017 Estimate  
(negative numbers are a benefit; positive numbers are a cost)**

<u>PJM Zone</u>	<u><math>\Delta</math> NLP</u>	<u>% in PA</u>	<u><math>\Delta</math> NLP for PA</u>
AECO	\$ 15,327,708	0.00%	\$ -
AEP	(52,089,668)	0.00%	-
APS	(85,590,533)	44.75%	(38,301,764)
BGE	(44,930,925)	0.00%	-
COMED	(11,700,983)	0.00%	-
DAY	(5,378,001)	0.00%	-
DEOK	(6,824,715)	0.00%	-
DOM	(274,155,876)	0.00%	-
DPL	33,704,983	0.00%	-
DUQ	(2,844,756)	100.00%	(2,844,756)
EKPC	(4,184,839)	0.00%	-
FE-ATSI	260,370	7.20%	18,747
JCPL	29,886,093	0.00%	-
LINDVFT	3,797,655	0.00%	-
METED	22,005,619	100.00%	22,005,619
NEPTHVDC	7,480,044	0.00%	-
O66HVDC	3,131,553	0.00%	-
PECO	85,911,567	100.00%	85,911,567
PENELEC	13,178,628	100.00%	13,178,628
PEPCO	(123,784,114)	0.00%	-
PLGRP	52,483,339	100.00%	52,483,339
PSEG	57,392,516	0.00%	-
RECO	2,007,128	0.00%	-
zPJMIMP	-	0.00%	-
Total	\$ (284,917,209)		\$ 132,451,379
$\Sigma$ Benefits	\$ (611,484,411)		\$ (41,146,520)
$\Sigma$ Costs	\$ 326,567,201		\$ 173,597,899

Source: Transource response to OCA VI-2 attachment, NLP Analysis tab

Note: PA portion of APS and FE-ATSI Zones calculated on p. 2

**Change in Net Load Payments ( $\Delta$  NLP) for Pennsylvania (PA) Based on Sept. 2018 Estimate  
 (negative numbers are a benefit; positive numbers are a cost)**

<u>PJM Zone</u>	<u><math>\Delta</math> NLP</u>	<u>% in PA</u>	<u><math>\Delta</math> NLP for PA</u>
AECO	\$ 17,903,639	0.00%	\$ -
AEP	5,318,294	0.00%	-
APS	(4,738,473)	44.75%	(2,120,467)
BGE	(158,435,444)	0.00%	-
COMED	67,467,567	0.00%	-
DAY	1,670,667	0.00%	-
DEOK	17,188,314	0.00%	-
DOM	(382,049,485)	0.00%	-
DPL	30,415,129	0.00%	-
DUQ	4,232,346	100.00%	4,232,346
EKPC	(357,204)	0.00%	-
FE-ATSI	55,324,876	7.20%	3,983,391
JCPL	52,659,515	0.00%	-
LINDVFT	5,322,364	0.00%	-
METED	62,147,589	100.00%	62,147,589
NEPTHVDC	9,969,764	0.00%	-
O66HVDC	5,107,620	0.00%	-
PECO	83,000,950	100.00%	83,000,950
PENELEC	31,631,372	100.00%	31,631,372
PEPCO	(161,710,391)	0.00%	-
PLGRP	164,913,851	100.00%	164,913,851
PSEG	72,968,290	0.00%	-
RECO	2,994,278	0.00%	-
zPJMIMP	-	0.00%	-
Total	\$ (17,054,570)		\$ 347,789,033
$\Sigma$ Benefits	\$ (707,290,998)		\$ (2,120,467)
$\Sigma$ Costs	\$ 690,236,427		\$ 349,909,499

Source: Transource response to OCA XXII-2

Note: PA portion of APS and FE-ATSI Zones calculated on p. 2

**OCA STATEMENT NO. 1**

**Schedule SJR-7**



**Allocation of Project Costs to PJM Zones in Pennsylvania  
 (Dollars are millions)**

PVRR of Project cost estimate as of 9/13/2018:       \$ 498.09

<u>PJM Zone</u>	<u>% of Project Cost</u>	<u>Project Cost \$</u>	<u>% in PA</u>	<u>\$ in PA</u>
AEP	6.46%	\$ 32.18	0.00%	\$ -
APS	8.73%	43.48	44.75%	19.46
BGE	19.73%	98.27	0.00%	-
COMED	2.16%	10.76	0.00%	-
CONED	0.06%	0.30	0.00%	-
DAY	0.59%	2.94	0.00%	-
DEOK	1.02%	5.08	0.00%	-
DOM	39.92%	198.83	0.00%	-
DUQ	0.01%	0.05	100.00%	0.05
EKPC	0.45%	2.24	0.00%	-
PEPCO	<u>20.87%</u>	<u>103.95</u>	0.00%	-
Total	100.00%	\$ 498.08		\$ 19.51

Sources:

Project cost from Sch. SJR-5

% in PA from Sch. SJR-6, p. 2

**OCA STATEMENT NO. 1**

**Schedule SJR-8**

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

**Data Request OCA-II-02:**

Reference: Transource Statement 3 (McGlynn), p. 3, lines 8-12. Concerning the description of the IEC Project:

- a. Did PJM determine the specific location for the new Furnace Run substation? If so, please provide all studies used by PJM to determine the location, including any alternative locations considered and rejected. If not, why not?
- b. Did PJM determine the specific route of the Furnace Run-Conastone 230 kV Transmission Line? If so, please provide all studies used by PJM to determine the location, including any alternative locations considered and rejected. If not, why not?

**Response:**

- a. & b. No. The general locations of Project 9A's individual components are determined by Transource PA and are dependent on the location of existing facilities.

**Witness:** Paul McGlynn

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

**Data Request OCA-II-03:**

Reference: Transource Statement 3 (McGlynn), p.5, lines 17-20. Mr. McGlynn states that "PJM supports" the PUC's approval of the IEC-East Project.

- a. Does this statement mean that PJM supports the concept of constructing East Project facilities consistent with the general scope of the project set forth in the Designated Entity Agreement?
- b. Does this statement mean that PJM supports the specific route and location of the East Project substation and transmission line as set forth in this Application? If so, please provide all studies, analyses, and decision documents (minutes of meetings, for example) PJM used or relied upon to determine that it "supports" the specific route and location of the East Project.
- c. What is Mr. McGlynn's understanding of the specific questions the PUC is being asked to determine in this case? For each such question, please state the meaning of PJM's "support" for the PUC's "approval" of the East Project.

**Response:**

- a. Yes.
- b. PJM does not opine or determine the specific location or route of projects. The siting of the project components described in the Application is the responsibility of Transource PA.
- c. To the extent this question calls for a legal conclusion, no answer is required. Mr. McGlynn's testimony is limited to the facts related to PJM's analysis determining the need for the project under PJM's planning criteria.

**Witness:** Paul McGlynn

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

**Data Request OCA-II-05:**

In selecting Project 9A over alternative proposals, please state whether PJM considered each of the following criteria. For each criterion that PJM did consider, please provide all studies or other documents showing the comparative evaluation and/or weighting of the criterion.

- a. Impact of Project 9A and alternatives on the natural environment in Pennsylvania;
- b. Impact of Project 9A and alternatives on scenic and historic areas in Pennsylvania;
- c. Impact of Project 9A and alternatives on land use in Pennsylvania;
- d. Impact of Project 9A and alternatives on soil and sedimentation in Pennsylvania;
- e. Impact of Project 9A and alternatives on plant and wildlife habitats in Pennsylvania;
- f. Impact of Project 9A and alternatives on terrain in Pennsylvania;
- g. Impact of Project 9A and alternatives on hydrology in Pennsylvania;
- h. Impact of Project 9A and alternatives on landscape in Pennsylvania;
- i. Impact of Project 9A and alternatives on archaeological areas in Pennsylvania;
- j. Impact of Project 9A and alternatives on geologic areas in Pennsylvania;
- k. Impact of Project 9A and alternatives on historic areas in Pennsylvania;
- l. Impact of Project 9A and alternatives on scenic areas in Pennsylvania;
- m. Impact of Project 9A and alternatives on wilderness areas in Pennsylvania;
- n. Impact of Project 9A and alternatives on scenic rivers in Pennsylvania;
- o. Impact of Project 9A and alternatives on airports in Pennsylvania;
- p. Impact of Project 9A and alternatives on local comprehensive plans in Pennsylvania;
- q. Impact of Project 9A and alternatives on local zoning ordinances in Pennsylvania;

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

- r. The proximity of Project 9A and alternatives to residential structures in Pennsylvania;
- s. The proximity of Project 9A and alternatives to non-residential structures in Pennsylvania;
- t. Impact of Project 9A and alternatives on the preservation of the natural, scenic, historic and esthetic values of the environment in Pennsylvania; and
- u. Impact of Project 9A and alternatives on Pennsylvania's public natural resources.

**Response:**

The criteria listed above generally relate to the siting studies which were conducted by and are the responsibility of Transource PA.

However, PJM engaged an independent consultant to produce an Independent Cost Review/Constructability Report. Please refer to PJM's website for a copy of this report, available at [<http://www.pjm.com/~media/planning/rtep-dev/expand-plan-process/ferc-order-1000/rtep-proposal-windows/2014-2015-long-term-proposal-window-independent-cost-review-whitepaper.ashx>]. Among many other requirements, the Statement of Work ("SOW") for this engagement required a summary (desktop review) of "potential high-level environmental risks and items that may require protracted permitting timeframes or raise serious issues during the permitting process."

More specifically, the SOW stated as follows:

The consultant "will examine each Project utilizing available public sector data, aerial photographs, and real estate records to determine if the Project is feasible and to identify potential regulatory permitting risks." (...)

The independent consultant reviewed the following information:

- National Wetland Inventory mapping from United States Fish and Wildlife
- Mapping of specially designated wetlands or rivers
- United States Department of Agriculture (USDA)/The Natural Resources Conservation Service (NRCS) Land Cover mapping
- Land Use Mapping
- Public Lands: State/National Forests, Natural Areas, Preserves, Game Lands,

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

- and Recreation area mapping
- Cultural Resources Mapping including the count of previously identified Resources
  - Aquatic Resource mapping including the count of Submerged Historic Resources (if applicable)
  - Online distribution data of Rare, Threatened and Endangered (RTE) species within a 0.5 mile radius of the study corridor
  - Online distribution data of Rare, Threatened and Endangered (RTE) species within a 0.5 mile radius of the study corridor

The following is a summary of findings:

- Four critical constraints were identified for the proposed Southern Pennsylvania project. Of these, the most problematic is likely to be surveys associated with rare bat species and timeline associated with environmental permitting. The other critical constraints involve the access and/or usage of state lands, right of way acquisition, and cultural resources investigations and clearances (as necessary). The major potential risks are:
  - Based on the length of the East and West lines, and the rebuild project, it is assumed that a Joint (Individual) Permit will be needed for the Pennsylvania and/or Maryland project facilities once final alignment and access roads are laid out. This will involve coordination between federal and state agencies. This type of review process can require 12 months or more.
  - The East and West lines, rebuild project, and associated substation expansions and installations are all within the range of rare bat species. Surveys could be required that have time of year requirements, furthermore time of year restrictions on tree clearing could be implemented pending coordination with U.S. Fish and Wildlife Service and results of surveys.
  - The East line crosses Pennsylvania State Game Land 327. Acquiring easements on state public lands typically involve multiple reviews and coordination between state environmental and real estate divisions.
  - The vast majority of the Southern Pennsylvania project is located on undeveloped land that would potentially be subject to archaeological surveys. Historic and archaeological investigations (Phase II and Phase III) beyond initial Phase I reconnaissance surveys, along with ongoing consultation and reporting, can have a substantial impact on schedule and cost.

**Witness:** Paul McGlynn

**Application of Transource Pennsylvania LLC  
Independence Energy Connection-East Project  
Docket No A-2017-2640195**

**Interrogatories of the Office of Consumer Advocate  
Set II  
(Responses dated 2/16/2018)**

**Data Request OCA-II-06:**

Reference: Transource Statement 3 (McGlynn), p. 9, lines 5-8. Do any of the "applicable laws, regulations, and tariffs" that govern PJM's operations and decisions include responsibilities for the protection or preservation of the natural, scenic, historic and/or aesthetic environment? If so, please list and describe the specific laws, regulations, and/or tariffs that include such responsibilities.

**Response:**

The responsibilities referenced in the question with respect to operational decisions about siting matters remain entity designated as the appropriate entity to construct and own or finance the project and are addressed in paragraph 4.2.1 of the Consolidated Transmission Owners Agreement (CTOA). To the extent those responsibilities impact operations, transmission owners must convey any necessary operating restrictions to PJM.

In relevant part, the CTOA provides as follows:

**4.2.1**

Subject to: (i) the requirements of applicable law, government regulations and approvals, including, without limitation, requirements to obtain any necessary state or local siting, construction and operating permits; (ii) the availability of required financing; (iii) the ability to acquire necessary right-of-way; (iv) the right to recover, pursuant to appropriate financial arrangements and tariffs or contracts, all reasonably incurred costs, plus a reasonable return on investment; and (v) other conditions or exceptions set forth in the Regional Transmission Expansion Planning Protocol, Parties designated as the appropriate entities to construct and own or finance enhancements or expansions applicable to the PJM Region specified in the Regional Transmission Expansion Plan or required to expand or modify Transmission Facilities pursuant to the PJM Tariff shall construct and own or finance such facilities or enter into appropriate contracts to fulfill such obligations.

**Witness:** Paul McGlynn



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**Data Request OCA-II-07:**

Reference: Transource Statement 3 (McGlynn), pp. 10-16. In conducting its planning process, please state whether PJM considers each of the following criteria. For each criterion that PJM considers, please describe the information PJM requires in order to make informed decisions about each such criterion as part of its planning process.

- a. Impact on the natural environment;
- b. Impact on scenic and historic areas;
- c. Impact on land use;
- d. Impact on soil and sedimentation;
- e. Impact on plant and wildlife habitats;
- f. Impact on terrain;
- g. Impact on hydrology;
- h. Impact on landscape;
- i. Impact on archaeological areas;
- j. Impact on geologic areas;
- k. Impact on historic areas;
- l. Impact on scenic areas;
- m. Impact on wilderness areas;
- n. Impact on scenic rivers;
- o. Impact on airports;
- p. Impact on local comprehensive plans;

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- q. Impact on local zoning ordinances;
- r. Proximity to residential structures;
- s. Proximity to non-residential structures;
- t. Impact on the preservation of the natural, scenic, historic and esthetic values of the environment; and
- u. Impact on public natural resources.

**Response:**

Please see the response to OCA-II-5.

**Witness:** Paul McGlynn

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**Data Request OCA-II-08:**

Reference: Transource Statement 3 (McGlynn), p. 13 line 9 to p. 14 line 5. For each of the following factors or criteria, please state whether the Transmission Expansion Advisory Committee considers and evaluates information concerning each such criterion in performing its responsibilities.

- a. Impact on the natural environment;
- b. Impact on scenic and historic areas;
- c. Impact on land use;
- d. Impact on soil and sedimentation;
- e. Impact on plant and wildlife habitats;
- f. Impact on terrain;
- g. Impact on hydrology;
- h. Impact on landscape;
- i. Impact on archaeological areas;
- j. Impact on geologic areas;
- k. Impact on historic areas;
- l. Impact on scenic areas;
- m. Impact on wilderness areas;
- n. Impact on scenic rivers;
- o. Impact on airports;
- p. Impact on local comprehensive plans;

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- q. Impact on local zoning ordinances;
- r. Proximity to residential structures;
- s. Proximity to non-residential structures;
- t. Impact on the preservation of the natural, scenic, historic and esthetic values of the environment; and
- u. Impact on public natural resources.

**Response:**

Please see the response to OCA-II-5.

PJM does not have information sufficient to opine on what factors or criteria individual members of the Transmission Expansion Advisory Committee may consider and evaluate at different times or in connection with different projects or needs.

**Witness:** Paul McGlynn

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**Data Request OCA-II-10:**

Reference: Transource Statement 3 (McGlynn), p. 15, lines 10-12. In evaluating the "costs" and "benefits" of a proposed market efficiency project, please state whether PJM considers and evaluates information concerning "costs" and "benefits" related to each of the following criteria. (PJM note – all siting studies are completed by Transource, not PJM)

- a. Impact on the natural environment;
- b. Impact on scenic and historic areas;
- c. Impact on land use;
- d. Impact on soil and sedimentation;
- e. Impact on plant and wildlife habitats;
- f. Impact on terrain;
- g. Impact on hydrology;
- h. Impact on landscape;
- i. Impact on archaeological areas;
- j. Impact on geologic areas;
- k. Impact on historic areas;
- l. Impact on scenic areas;
- m. Impact on wilderness areas;
- n. Impact on scenic rivers;
- o. Impact on airports;
- p. Impact on local comprehensive plans;
- q. Impact on local zoning ordinances;

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- r. Proximity to residential structures;
- s. Proximity to non-residential structures;
- t. Impact on the preservation of the natural, scenic, historic and esthetic values of the environment; and
- u. Impact on public natural resources.

**Response:**

Please see the response to OCA-II-5.

**Witness:** Paul McGlynn

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**Data Request OCA-II-11:**

Reference: Transource Statement 3 (McGlynn), p. 16 lines 3-4. Does the consideration of "State Public Policy" include a consideration or evaluation by PJM of each of the following criteria as related to a proposed project?

- a. Impact on the natural environment;
- b. Impact on scenic and historic areas;
- c. Impact on land use;
- d. Impact on soil and sedimentation;
- e. Impact on plant and wildlife habitats;
- f. Impact on terrain;
- g. Impact on hydrology;
- h. Impact on landscape;
- i. Impact on archaeological areas;
- j. Impact on geologic areas;
- k. Impact on historic areas;
- l. Impact on scenic areas;
- m. Impact on wilderness areas;
- n. Impact on scenic rivers;
- o. Impact on airports;
- p. Impact on local comprehensive plans;
- q. Impact on local zoning ordinances;

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- r. Proximity to residential structures;
- s. Proximity to non-residential structures;
- t. Impact on the preservation of the natural, scenic, historic and esthetic values of the environment; and
- u. Impact on public natural resources.

**Response:**

The question is not applicable because Project 9A is not driven by State Public Policy, as that term is used in connection with PJM's planning process.

**Witness:** Paul McGlynn