Shaw Statement No. 1

2/26/19 Hbg

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.	:	Docket No. A-2017-2640195 Docket No. A-2017-2640200

DIRECT TESTIMONY

OF

BARRON SHAW

On Behalf of

Barron Shaw & Shaw Orchards

September 25, 2018

PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Barron Shaw. My business address is 21901 Barrens Rd S, Stewartstown, PA 17363.

BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR TITLE?

B. I am self-employed. My wife and I run Shaw Orchards.

ON WHOSE BEHALF ARE YOU PROVIDING THIS TESTIMONY?

C. This testimony is in support of myself as a directly affected landowner, and my business.

WHAT IS YOUR FAMILY HISTORY WITH SHAW ORCHARDS?

D. The Shaw property has been in the family since the early 1800's. The original deed still hangs in the family home. The brick home stands just north of the Mason Dixon line, and was built by my great-great-great grandfather Jacob Yost in 1862 during the Civil War. In the late 1800's, Calvin Shaw married a Yost, and the property changed names. Shaw Orchards began commercial operation in 1909. Russell Shaw, my great-grandfather, built apple packing facilities, and shipped large quantities of apples to Baltimore, and the Maryland suburbs. My grandfather, Clay Shaw, took over the operation and was a founding leader in the Knouse Foods Cooperative, which is the one of the largest apple processors in the nation. My father, Glenn Shaw, has served on the boards of numerous fruit organizations, and retired in 2014 after my return to the farm. My family has deep roots on this land. The property is really the oldest member of our family.

1 **WHAT IS YOUR PERSONAL HISTORY WITH SHAW ORCHARDS?**

2 E. I was raised on the orchard. My earliest memories include working in the fields
3 with migrant laborers, pruning trees throughout the winter, and learning to drive
4 before my feet could really reach the pedals. I received a Bachelors of Science in
5 Systems Engineering from the University of Virginia, and spent twenty years
6 working for large consumer products firms in the field of Information Systems.
7 During that time I was physically removed from the farm, but still provided
8 support in terms of web-design. I retired from my career, and returned to the farm
9 in 2013 with my family to take over the management from my retiring parents. I
10 assumed ownership of the majority Maryland portion of the farm in 2016.

11 **WHY DID YOU RETURN TO THE FARM?**

12 F. I returned to the farm for two reasons: 1) all other options would eventually lead
13 to the loss of the orchard from the family; and 2) I believed I would enjoy
14 growing food as a farmer.

15 **HOW DO YOU FEEL ABOUT YOUR DECISION?**

16 G. Farming is hard. And the farming of orchard crops is arguably the most difficult.
17 Every time it rains during the period of April through July, my apples are at risk
18 from disease, requiring frequent and expensive protective chemicals. We have
19 experienced two major exotic pests in just the last 6 years, with Brown
20 Marmorated Stink Bug, Spotted Wing Drosophila, and a third pest, The Spotted
21 Lanternfly, which has spread to the next county will arrive next year if it is not
22 here already. Most of the apple varieties we produce on the farm are worth little
23 more now than they were 30 years ago, while labor, chemicals, and insurance, our
24 three biggest expenses, have increased significantly in that time. The labor supply

for the hard fieldwork is almost non-existent, and our crew size shrinks each year. My wife and I work an average of 12 hours a day, six days a week, from mid-March through November each year. We do not have a summer vacation.

Still, there is something intrinsically good about farming that is difficult to describe to those who have not experienced it. Maybe it is the challenge of overcoming all the adversity. Perhaps it is the knowledge that thousands, hundreds of thousands of people, have been nourished through our efforts. Or maybe it is a pride that our orchard is an important destination for thousands of people each year who would otherwise not be able to teach their kids where food comes from. Whatever the reason, in the sincere words of Washington, "I'd rather spend a day on my farm than be emperor of the world."

PLEASE DESCRIBE THE MAJOR USES OF YOUR LAND

H. There are about 250 acres of land, 220 in Maryland and the rest in Pennsylvania. Some of the land in Pennsylvania surrounds the family home, currently inhabited by my parents. Most of the rest of the Pennsylvania ground is rented for what is typically called crop-farming (corn and soybeans). A small portion contains part of our cherries and apricots. The Maryland portion of the property contains about 100 acres of orchard, 50 acres of ponds and woods, 20 acres of berries and small fruit, and the rest is used for crop-farming. About 45 acres of property in PA and MD is used for crop-farming each year.

1 **WHAT ARE THE MAJOR CHANNELS FOR CROPS?**

2 I. The corn and soybean fields are rented to a farmer who has the right machinery to
3 manage those crops. Wholesale fresh market packers take about 50% of the apple
4 volume, Knouse foods takes about 40% for processing, and we sell about 10%
5 direct to customer (retail). 80% of peaches are sold wholesale to grocery stores or
6 other farms, and about 20% is sold direct to customer (retail). 100% of all other
7 crops are sold directly to customers. The direct-to-customer channel includes our
8 retail market, farmers' markets, and pick-your-own sales.

9 **PLEASE DISCUSS THE PROFITABILITY OF EACH CHANNEL**

10 J. The best way to describe the profitability of the apple market is to provide
11 example prices per channel. In the late 70's and early 80's, golden delicious
12 canning apples returned $2.65/bushel, and packed golden delicious apples
13 returned $7.25/bu. In 2018, Knouse foods will pay $4.62 per bushel for golden
14 delicious. In 2017, a bushel of tree-run golden delicious returned $6.16 from our
15 fresh market packer. Our retail store sold the same apples for $22 per half-bushel,
16 or $44 per bushel. Farm markets returned an equivalent of $70 per bushel, and
17 pick-your-own returned $38 per bushel. The pick-your-own channel requires no
18 labor for harvest, storage, shipping, or merchandising.

19

20 Wholesale apple prices have roughly doubled in 35 years, while retail prices
21 return 300-1300% over wholesale prices.

22 **PLEASE DISCUSS THE SENSITIVITY OF THE ORCHARD TO EACH CHANNEL**

23 K. Traditional wholesale channels currently make up about 90% of our volume, but
24 only half of our gross proceeds. Direct-to-customer channels make up a fraction

of the volume, but are now a full 50% of the gross. Because they are sold for such a high margin, they are a critical part of our business, and drive the profit. Put simply, we would be out of business if we did not have a successful direct-to-consumer operation.

IS THIS TYPICAL OF OTHER ORCHARDS?

L. Yes. Almost all other orchards are even further along on this trend. There are almost no orchards left in Maryland that rely primarily on wholesale fruit sales for their profitability. The only orchards left in Pennsylvania that rely exclusively on the wholesale market either a) have no option of a retail market because of their location; b) have a large enough scale to command higher wholesale prices; or c) have their own large-scale packing facilities.

HOW IMPORTANT IS PICK-YOUR-OWN TO THE DIRECT-TO-CONSUMER CHANNEL?

M. In 2017, 44% of direct-to-consumer sales of Shaw-grown produce were from pick-your-own. This includes strawberries, cherries, blueberries, raspberries, peaches, apples, and pumpkins.

WHY IS THE PICK-YOUR-OWN OPERATION SUCCESSFUL?

N. Our customers often travel long distances, so we know we are a destination. They seek us out for several reasons. Firstly, there are fewer orchards offering pick-your-own fruit every year. Secondly, they are looking for a wholesome family activity that is educational, nutritional, and fun. And third, they are looking for a scenic and safe outdoor activity that is inexpensive.

1 **WHY DOES THE IEC CONCERN YOU WITH REGARDS TO PICK-YOUR-OWN?**

2 O. Only a few customers come to our orchard only to harvest fruit. After all, our
3 farm market sells the same fruit at only a slight premium to the cost of pick-your-
4 own. Most people return to pick-your-own for the *experience*. This experience
5 includes the sights, the sounds, the aroma, and the authentic nature of a centuries-
6 old farm. Customers consistently tell us that they love to visit our beautiful farm.
7 Our history, our scenery, and our authentic story are something people seek out.
8 A 13-story 230kV high voltage powerline, with its humming and crackling lines
9 is antithetical to this experience. It would destroy the atmosphere that is perhaps
10 our most precious asset.

11 **WOULD THE PROPOSED LOCATION OF THE IEC BE VISIBLE TO THE PICK-**
12 **YOUR-OWN AREAS?**

13 P. Yes. I'll defer to the site-visit testimony for detailed descriptions of distances.

14 **WAS TRANSOURCE MADE AWARE OF YOUR CONCERNS REGARDING THE**
15 **IMPACT ON THE PICK-YOUR-OWN BUSINESS?**

16 Q. Yes. On June 25, 2017 I sent an email to Mary Urban at Transource describing
17 the great impact this would have on our operation. I also sketched on the
18 Norrisville open house map the area of the farm used for pick your own.

19 **ARE THERE OTHER CONCERNS FOR PICK-YOUR-OWN?**

20 R. It should come as no surprise that many customers who seek out family farms to
21 buy fruit and vegetables are concerned with their health, and the health of their
22 families. A large proportion of the population has concerns regarding the health
23 effects of high voltage lines. Put simply, it doesn't matter what I think about the
24 health effects of high voltage lines, if my customers believe that they are

dangerous, then their presence will cost me money, either from people refusing to pick near them, or because they don't want food that is grown near them.

ARE THERE CONCERNS REGARDING THE PRESENCE OF IRRIGATION IN THE FIELDS?

S. Yes. We use permanently sited irrigation in many of our fields, including the field that lies under the proposed power line. There are not only concerns about damage during construction, but concern that after construction is complete, an accident in the field could cause water under high pressure to jet into the line.

ARE THERE PRECENDENTS FOR THIS CONCERN?

T. Yes. In West Penn Power vs. PA PUC (199 Pa.Super.25), the Superior Court affirmed the PUC's decision to deny an application on the grounds that a leak in the irrigation system presented a danger to those working under the lines. In this case, a break in the irrigation line under pressure was projected to fly 100 feet in the air, causing any person that came into contact with the system to suffer an electrical shock. Specifically, the court reaffirmed that the safety of the public "for whose convenience, accommodation, safety, and protection the Public Utility Law is concerned does not consist solely of persons served by the utility, but also includes persons generally who may come into contact with the utility's facilities."

WAS TRANSOURCE MADE AWARE OF THIS DANGER?

U. Yes. Transource was told about the permanent irrigation placement at the Norrisville, MD open house on August 9, 2017.

1
2 **ARE THERE POTENTIAL REGULATORY ISSUES WITH THE POWER LINES?**

3 V. Yes. The Food Safety Modernization Act (FSMA) was signed by President
4 Obama in 2011 and has been rolled out over the subsequent years. The legislation
5 requires farms of our size to comply with many food safety regulations. Among
6 those regulations are those relating to overhead contamination of "fresh produce"
7 (produce that does not typically include a pathogen kill step in preparation), as
8 well as rules regarding the contamination of produce by wildlife. Audits of our
9 farm are conducted annually by Maryland Department of Agriculture in order to
10 maintain our status as GAP-certified (Good Agricultural Practices). Future
11 FSMA audits are also within the responsibility of MDA. Please see exhibit 1 for
12 a letter from MDA dated 3/10/18 describing our responsibilities under FSMA and
13 GAP regulations, specifically with regards to birds on power lines. The advice
14 from MDA is clear: it is not advisable to site power lines over fields of produce.

15 **ARE FLOCKS OF BIRDS COMMON AT THE ORCHARD?**

16 W. Yes, during the migration of starlings. Every evening, they flock to the high
17 power lines that run along the ridges. Please see exhibit 2 for a photo of birds on
18 power lines. This photo was taken 9/1/17 by Barron Shaw at our farm market,
19 looking across the street to the north-northwest. It is not unusual to see birds
20 shoulder-to-shoulder on the lines for a distance of nearly 2000 feet.

21 **WAS TRANSOURCE MADE AWARE OF CONCERNS REGARDING WILDLIFE**
22 **DURING THE SITING REVIEW?**

23 X. Yes. I sent an email to Mary Urban at Transource on 9/4/17 with the picture in
24 exhibit 2, and an explanation of the issue.

1 **CAN POWER LINES IMPACT FIELD CROPS?**

2 Y. One of the immediate concerns regarding field crops is the impact on aerial
3 spraying of field crops. We have used helicopters to spray field corn in the past,
4 and given the topography of our area, it is hard to see how a helicopter could
5 safely spray the fields affected by the power lines. Helicopters must stay close to
6 the crop, but require considerable flexibility in altitude and area in order to make
7 turns where the fields end and the woods begin. Please refer to the email from
8 Mr. Kirk Martin, Helicopter Applicators Inc. in exhibit 3.

9 Z. The future use of drones is also problematic. Currently, the ceiling for drone use
10 is 400ft. Given changes in elevation between the takeoff location and the location
11 of the transmission tower base, this sets up a situation where the drone may have a
12 very narrow altitude range in which to work safely, and may be forced to fly at an
13 altitude that eliminates the ability to image with sufficient resolution. Examples
14 of future drone usage include counting fruit tree blossoms to predict fruit load,
15 and looking for insect infestations before they grow large.[1] I currently use a
16 drone at the orchard and believe that it will have even more use in the future.

17 **IS SHAW ORCHARDS A PRESERVED FARM?**

18 AA. Yes, the Maryland portion of the property was preserved by the State of
19 Maryland's Maryland Agricultural Land Preservation Foundation (MALPF).
20 There is no possibility of us ever using the land for anything other than
21 agricultural purposes. The easement states that the purpose of the easement is to

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[1] Pennsylvania State Horticulture Association (SHAP) research committee, 2018.

"enable the land to remain in agricultural use... and to prevent any use... that would impair or interfere with its agricultural value, character, use or utility. " I believe we have a strong case that high voltage lines threaten our agricultural value, and are completely inconsistent with the current character of the land.

HAS YOUR STATUS AS A PRESERVED FARM BEEN HELPFUL?

BB. No. Transource has stated that their siting process attempted to impact as few people as possible. By definition, this means that they "aimed" for large tracts of land. The large tracts of land are often large tracts exactly because the owners have elected to preserve them. Preserving a farm therefore makes it a target. Moreover, the amount of money that I am entitled to is only a fraction of its value if it were not conserved.

DOES MALPF STAND TO BENEFIT BY THE EASEMENT?

CC. Yes. According to MD Section 2-515 (b) (2) Transource would owe MALPF the amount that MALPF paid (to the Shaws) for the conservation easement. I would receive the agricultural value of the land, plus any increase in the value of the land if it were unencumbered by the conservation easement. In my opinion, this is an example of the government finding a way to seize the property and get paid for doing so.

HOW DO YOU FEEL ABOUT THE THREAT OF EMINENT DOMAIN ON PRESERVED LAND?

DD. This is antithetical to the purpose of preservation. If this project is successful in its application, I will actively work against conservation organizations that claim to be working in farmers' and environmental interests. I do not feel that my

interests have been protected by this easement, and I think every farmer should think twice before selling development rights. The trust has been broken.

WAS TRANSOURCE AWARE THAT YOUR LAND IS PRESERVED?

EE. Yes. They had maps of all preserved properties at the Norrisville open house on August 9, 2017.

HOW HAVE YOU BEEN TREATED BY TRANSOURCE?

FF. The majority of my interactions with Transource have been cordial and professional, and even friendly. However, my first face to face meeting did not go as well, and corroborates what others have said about their dealings with Transource. On August 9, 2017 Transource held an open house at Norrisville Elementary School. I arrived between 30 minutes and an hour after the event began. As I walked in from the parking lot, I was immediately recognized by a citizen who took me by the arm and asked if it was true that the Shaws were negotiating with Transource. I was confused, and said we had not even spoken to Transource. She told me that Transource had been telling people that "the Shaws are onboard" and that we were negotiating during the meeting. I asked her to take me to the person who told her that. On the way into the building, I was recognized by Transource's Public Affairs person, Mary Urban (whom I had never met in person). She tried to welcome me, but we continued together into the event and met the Transource representative who had been spreading the rumor. He confessed to stating that he believed we were negotiating. I told him in no uncertain terms that my family was not negotiating and that he must stop spreading rumors about me and my family. I admit to raising my voice. He was

ushered out of the room by other Transource people. The rest of the event was uneventful. Ms. Urban, with whom my relationship has always been good, can corroborate this event if asked. If she cannot, I will provide others who will. This behavior may not be illegal; however it contradicts many of Transource's Internal Practices as documented in exhibit 4. It also served to harden my opinion against Transource.

WHAT IS THE MOST COMPELLING ARGUMENT AGAINST THE IEC?

GG. In an editorial published in local papers on 9/21/18, PJM Vice President of Planning Steve Herling stated the core justification of the IEC: "After all, it would not be fair for customers in one area to consistently pay higher prices than others do simply because the system's design prevented some customers from accessing the lowest-cost electricity."[2] The implication of this statement is that all customers are *entitled* to the lowest-cost electricity possible.

There is no assertion here that there is any law, regulation, constitutional guarantee, or even a policy that would indicate that there is something wrong with the status quo. Instead, he says, "it would not be fair." <u>This project is predicated solely on the assumption of an entitlement that is documented nowhere.</u>

I believe that proximity to generating facilities should matter. People who live near generators *should* pay less for electricity. These are the people who tolerate the noise, the emissions, the visual impacts, and the other deleterious effects of

2 Op/Ed, York Daily Record, September 21, 2018. York Dispatch, September 16, 2018.

large generating facilities. These are the people who absorbed the capital charges for existing facilities in their rates over the years. There is as little logic in Mr. Herling's statement as there is legal responsibility to approve a market efficiency project... none.

WHAT ARE THE TECHNICAL IMPLICATIONS OF LOWEST-COST ELECTRICITY FOR ALL?

HH. The implications of Mr. Herling's invented entitlement are easy to predict. It would involve an ever-changing web of transmission lines that would be newly created whenever a new energy source was developed, and abandoned as energy sources went out of favor. For example, Maryland would not need to tolerate any generators in the state, nor take an active role in the risks and rewards of capacity generation. They would be entitled to new lines from whichever source presented the current cheapest electricity. One year this might be coal in western Pennsylvania, another year it might be gas from the shale regions, another year it might be subsidized wind energy from a new facility on a remote mountain ridge, another year from a future-technology nuclear fusion plant developed someplace else. There is no transmission system that could be designed that could always supply the cheapest electricity to every person in the grid, because the cheapest sources are always changing, and the loads are always shifting.

WHAT DOES MARKET EFFICIENCY TRANSMISSION DO TO PRICE SIGNALS FOR NEW CAPACITY?

II. Large-scale transmission intended solely to decrease Locational Marginal Price (LMP) has the adverse effect of discouraging investment in generation capacity in

1 the destination market. Maryland imports 47% of their electricity, and
2 Washington DC imports 100%.[3] For each megawatt that is imported into the
3 state, the decreasing price provides less incentive for generators to make an
4 investment in the state.

5 **WHAT IS THE IMPACT ON RELIABILITY AND RESILIENCE?**

6 JJ. The risk of disruption in the grid increases as generators are located further from
7 the load. A higher degree of resiliency is provided by generators located closer to
8 the loads. The ultimate expression of this design is a micro-grid, an encapsulated
9 system that can provide generation and distribution of power to a small area,
10 while still maintaining the flexibility of connecting to the larger grid. In any case,
11 importing cheap electricity works against grid resiliency insofar as new local
12 generation is suppressed. As PJM said themselves in the February 23, 2018
13 presentation on grid resiliency, "The first principal of ensuring reliability and
14 resilience is ensuring that the markets are sending the correct price signals. The
15 second principal is compensating generation based upon the desired operational
16 attributes."[4]

17 **WHAT IS THE IMPACT ON EFFICIENCY OF GENERATOR PROXIMITY TO**
18 **LOAD?**

19 KK. Proximity of generators also has the added benefit of reduced transmission losses.

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3 PJM's Maryland Washington, DC Infrastructure Report, July 2017.

4 https://www.pjm.com/-/media/committees-groups/committees/mrc/20180223-special/20180223-item-01-grid-resilience-in-rtos-and-isos.ashx

HOW HAS MARYLAND TREATED PENNSYLVANIA AND SURROUNDING STATES AS IT IMPORTS 47% OF ELECTRICITY?

LL. The IEC serves to continue Maryland's reliance on Pennsylvania's electricity. Ironically, Maryland sued the US Environmental Protection Agency (EPA) in 2017 to force EPA to make Pennsylvania use more stringent pollution control devices on electrical generators (State of MD vs. Scott Pruitt, case 1:17-cv-02873). In short, Maryland will not develop its own generation plants, requires significant imports from Pennsylvania, and feels empowered to regulate the way in which Pennsylvania produces it.

WHAT IS THE LIKELY IMPACT OF THE IEC ON PA RATEPAYERS?

MM. The way that the wholesale market works, it is not possible to export the "cheapest" power without impacting the price paid by PA ratepayers. I defer to OCA for a full analysis on PA ratepayers, but we can surely expect to pay more for the electricity that is left in the state.

WHAT IS WRONG WITH THE METHOD USED BY PJM TO CALCULATE THE MARKET EFFICIENCY BENEFIT?

NN. PJM is very proud of their ProMod modeling, which simulates the effects of generation, load, and (some but not all) changing transmission topology over a 15 year horizon. They also make an attempt to use sensitivity analysis to simulate the effects of increasing and decreasing costs of natural gas. However, the most recent analysis released in September 2018 did not include any sensitivity analysis.

A much better approach to decision analysis that includes the effects of

uncertainty in modeling inputs (like the price of natural gas) is a stochastic approach that includes probabilistic weighting. This involves weighting the independent input variable (e.g., the price of natural gas) by the probability of that value, and then summing the results. The result is called the expected value; the value that is not necessarily most likely to occur, but the value that represents a risk-neutral cost.

For example, for the hypothetical inputs in the table below, the price of natural gas is most likely to remain unchanged, but there is a 20% probability that it will fall a dollar, and a 35% probability that it will rise by a dollar. Assuming that the price can change anywhere in a continuous function from $-1 to $+1, the expected price change, the risk-weighted price change, is -1(0.2)+0(0.45)+1(.35)= 0.15. In other words, the most likely price effect is a rise of 15 cents, not a change of 0.

Natural Gas Price Change	**Probability %**
$-1	20
$0	45
$+1	35

HOW WOULD A RISK-WEIGHTED APPROACH CHANGE THE BENEFIT ANALYSIS?

OO. The economics of the IEC are heavily dependent on the continued low cost of natural gas in Pennsylvania. A thorough analysis of the current conditions affecting the supply and demand of this gas would indicate that it is more likely for the price of gas to rise than to fall, and there is more likelihood that a forecasted price will be too low than too high. Factors that drive this conclusion

include 1) the fact that it is not possible for the gas extraction fees to decrease from the current $0, but it is increasingly likely that extraction fees will be implemented; 2) already low prices discourage new development; 3) price trends since the minimum of 2016 indicate a rising price[5]. A risk-weighted analysis would most likely decrease the benefit of the IEC, and lower the benefit/cost ratio. The probabilities in the analysis would need to be supplied by an expert.

DOES THIS COMPLETE YOUR DIRECT TESTIMONY?

PP. Yes.

[5] Energy Information Administration (EIA) Natural Gas Price in PA: https://www.eia.gov/dnav/ng/hist/n3045pa3m.htm

EXHIBIT 1
Maryland Department of Agriculture Communication on Bird Risks

Maryland Department of Agriculture

Agriculture | *Maryland's Leading Industry*
Office of Marketing, Animal Industries and Consumer Services

Larry Hogan, Governor
Boyd Rutherford, Lt Governor
Joseph Bartenfelder, Secretary
Julianne A. Oberg, Deputy Secretary

The Wayne A. Cawley, Jr. Building
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410 841 5700 Baltimore-Washington
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FOOD QUALITY ASSURANCE PROGRAM
(410) 841-5769 FAX (410) 841-2750

March 10, 2018

Mr. Barron Shaw
Shaw Orchards
21901 Barrens Road S
Stewartstown, PA 17363

5594 Norrisville Road
White Hall, MD 21161

Dear Mr. Shaw:

Your concerns about overhead power lines providing overhead points of contamination for your produce crops affecting your ability to comply with Good Agricultural Practices (GAPs) food safety audits and the Food Safety Modernization Act (FSMA) Produce Safety Rule are valid. Although the GAPs audit is voluntary, most of your buyers require a certification of compliance with GAPs so failure to obtain certification would affect your ability to sell your product. The FSMA Produce Safety Rule is based on a federal law that requires compliance. Preventing the harvest of contaminated produce are required by both of these programs.

The Produce Safety Rule states "**§ 112.83 What requirements apply regarding grazing animals, working animals, and animal intrusion?**

(a) You must take the steps set forth in paragraph (b) of this section if under the circumstances there is a reasonable probability that grazing animals, working animals, or animal intrusion will contaminate covered produce.

(b) You must:

(1) Assess the relevant areas used for a covered activity for evidence of potential contamination of covered produce as needed during the growing season (based on your covered produce; your practices and conditions; and your observations and experience); and

(2) If significant evidence of potential contamination is found (such as observation of animals, animal excreta or crop destruction), you must evaluate whether the covered produce can be harvested in accordance with the requirements of § 112.112 and take measures reasonably necessary during growing to assist you later during harvest when you must identify, and not harvest, covered produce that is reasonably likely to be contaminated with a known or reasonably foreseeable hazard."

Although the rule does not specify that you must remove all wildlife habitat to prevent contamination of crops it does state that crops that are reasonably likely to be contaminated cannot be harvested. The presence of flocks of birds on overhead power lines would meet the reasonably likely to be contaminated with a known or reasonably foreseeable hazard requiring you to not harvest any portion of your crop that is grown under the power lines. The GAPs requirements are very similar to the FSMA Produce Safety Rule and would also require you to not harvest any product that is reasonably likely to be contaminated.

Please contact me if you need additional information on compliance with the FSMA Produce Safety Rule.

Sincerely,

Deanna L. Baldwin
Program Manager

Exhibit 2
Presence of Migratory Birds drawn to Power Lines

Exhibit 3
Statement from Helicopter Applicators

1 **Kirk Martin <kmartin@helicopterapplicators.com>**9/24/2018 2:48 PM

2 PROPOSED POWER LINE

3 To barron@shaworchards.com

4 Mr. Shaw,
5
6 As a company that provides aerial helicopter services for you, a potential power line running through
7 your fields will present an issue for us going forward in regards to our services. A power line running
8 through an agricultural field while spraying, seeding, etc....presents an inherent danger to the helicopter
9 operation. Depending on where the power line runs through the field it would be necessary to leave a
10 large buffer which would leave some crops unsprayed. And depending on the size of the field, a power
11 line running through it may make the field not advisable to spray with a helicopter altogether.
12
13 Thank you.
14
15
16 ***Kirk A. Martin***
17 ***Secretary/Treasurer***
18 ***Helicopter Applicators, Inc.***
19 ***Cell: 717-495-7749***
20 *kmartin@helicopterapplicators.com*
21
22

Exhibit 4
Transource Internal Practices

TRANSOURCE.
PENNSYLVANIA, LLC

Internal Practices for Dealing with the Public on Power Line Projects

Our success is built on our commitment to respecting the people and the environment in which we operate.

- Proactive and early engagement with potential route landowners and stakeholders
- Transparent proceedings throughout the project timeline
- Being available and providing various platforms for open dialogue with the community
- Maintaining a positive working relationship with all regulatory and environmental entities for guideline adherence throughout the planning and development phases

By respecting the people and the environment in which we operate, Transource PA is committed to listening to the communities and working with the landowners before finalizing project routes. With the combined experience of more than a century of responsible infrastructure development, Transource uses construction methods and practices to strike a balance between meeting energy needs and minimizing disturbance to communities and the environment.

All communications and interactions with property owners and occupants of property by all right-of-way agents and subcontractor employees representing Transource PA in the negotiation of right-of-way and the performance of surveying, environmental assessments and other activities for the Project must be based in factual information, made in good faith and adhere to the following standards:

- Do not make false or misleading statements. If you do not know the answer to a question, do not guess. Tell the property owner that you will investigate the question and provide a timely answer.
- Follow-up in a timely manner on all commitments to provide additional information.
- Do not misrepresent any fact.
- Do not send written communications (to a landowner or to Project personnel) suggesting an agreement has been reached if it has not.

All communications and interactions with property owners and occupants of property must be respectful and reflect fair dealing practices, including:

- Transource PA representatives, contractors, and agents promptly must identify themselves by showing their employment photo I.D. badge and have it displayed at all times while working on the project.
- Transource PA representatives, contractors, and agents contacting a property owner by telephone, promptly identify themselves as representing Transource.
- Do not engage in behavior that may be considered harassing, coercive, manipulative, intimidating or causing undue pressure.
- All communications by a property owner, whether in person, by telephone or in writing, in which the property owner indicates that he or she does not want to negotiate or does not want to give permission for surveying or other work on his or her property must be respected and politely accepted without argument. Unless specifically authorized by the Land Acquisition Manager, do not contact the property owner again regarding negotiations or requests for permission.

1

TRANSOURCE.
PENNSYLVANIA, LLC

- When asked to leave property, promptly leave and do not return unless specifically authorized by the Land Acquisition Manager.
- Obtain written permission from the property owner and tenants to enter property for purposes of surveying or conducting environmental assessments or other activities. Clearly explain to the property owner the scope of work to be conducted based on the permission given. Attempt to notify the occupant of the property each time you enter the property based on this permission.
- Do not represent that a relative, neighbor and/or friend supports or opposes the Project, even if it's true.
- Do not suggest that any person should be ashamed of or embarrassed by his or her opposition to the Project or that such opposition is inappropriate.
- Do not argue with property owners about the merits of the Project.
- Do not suggest that an offer is "take it or leave it."
- Do not threaten to call law enforcement officers or obtain court orders.
- Do not threaten the use of eminent domain.
- Avoid discussing a property owner's failure to note an existing easement when purchasing the property and other comments about the property owner's acquisition of the property.
- Do not give the property owner any legal advice. Instead advise that they contact an attorney about any legal matters or questions.
- If threatened, promptly and politely leave the property and report the issue to the Land Acquisition Manager.

All communications and interactions with property owners and occupants of property must respect the privacy of property owners and other persons.

- Do not discuss your negotiations or interactions with other property owners or other persons.
- Do not ask relatives, neighbors and/or friends to influence the property owner or any other person.
- Avoid discussions of personal matters about the property owner, others and yourself.

Transource PA operates with the highest standards of reliability, safety and federal and state compliance. We work with regional transmission organizations, like PJM, state regulators, local officials and agencies, property owners, customers and communities to ensure a mutually respectful and beneficial outcome. We are proud of our work and we are committed to being a partner and respecting this community as if it were our own home town and neighbors. Our mission, simply stated, is bringing comfort to our customers, supporting business and commerce, and building strong communities.

Shaw Statement 2.
2/26/19 Hbg

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

SURREBUTTAL TESTIMONY

OF

Barron Shaw

On Behalf of

Barron Shaw and Shaw Orchards

January 30, 2019
Supplemented/Revised February 22, 2019

1 **INTRODUCTION**

2 **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 My name is Barron Shaw. My business address is 21901 Barrens Rd S. ,

4 Stewartstown, PA 17363.

5 **BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR TITLE?**

6 I am the owner of Shaw Orchards.

7 **ON WHOSE BEHALF ARE YOU PROVIDING THIS TESTIMONY?**

8 I am testifying on behalf of myself, and my farm, Shaw Orchards.

9 **HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN THIS PROCEEDING?**

10 Yes, I submitted written testimony.

11 **WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

12 The purpose of this Surrebuttal Testimony is to refute certain portions of Rebuttal

13 Testimony offered by Transource PA, and introduce new evidence that derives

14 directly from testimony introduced by PJM and Transource.

15 **RESPONSES TO REBUTTAL TESTIMONY**

16 ***Mr. Weber and Mr. Herling – PJM's authority***

17 **MR. HERLING HAS INTERPRETTED YOUR PREVIOUS TESTIMONY AS**
18 **STATING THAT PJM LACKS LEGAL RESPONSIBILITY TO RELIEVE**
19 **CONGESTION. IS THIS AN ACCURATE INTERPRETATION?**

20 No, it is not accurate. FERC has provided PJM with the authority and the

21 responsibility to propose projects that serve the public good. In that mission, PJM is

22 guided by Tariffs and other documents. Not every PJM rule has been approved by a

23 governmental entity, and the policies at the core of this project have received no

24 oversight. It is the responsibility of this court to provide that oversight, and

25 ultimately determine whether PJM's proposals serve the public good.

WITH REGARDS TO THE IEC, WHAT ENTITY IS SOLELY RESPONSIBLE FOR APPROVING THE PUBLIC NEED, APPROVING THE SITING, AND ISSUING THE PERMITS NECESSARY TO ALLOW CONSTRUCTION IN THE STATE OF PENNSYLVANIA?

The Pennsylvania Utilities Commission (PUC) is solely responsible for these things. FERC has no jurisdiction for siting or permitting, and PJM has no approval authority beyond the sponsorship of the project for PUC consideration.

DOES PJM RECOGNIZE STATE SUPREMACY WITH REGARDS TO STATE APPROVAL?

Yes. OA Schedule 6 Sec 1.7 (a) states that "Subject to 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..., to the ability to acquire necessary right-of-way, ... Designated Entities designated as the appropriate entities to construct... enhancements or expansions specified in the Regional Transmission Expansion Plan shall construct ... such facilities ... to fulfill such obligations." [Portions omitted for purposes of clarity.]

Notwithstanding the obfuscation intrinsic in a 100 word sentence, PJM states that fulfilling construction obligations is contingent and subject to applicable state law and regulation. Failing those approvals, the obligation is absolved.

1 ***Mr. Weber, and Mr. Herling, on "Policy" and market efficiency.***

2 **WHAT DOES MR. WEBER SAY ABOUT POLICY DISCUSSION?**

3 Mr. Weber believes that it is inappropriate to discuss the policy ramifications of
4 exporting electricity, when such export harms the citizens of the state. He contends
5 that those discussions have already occurred at PJM and at FERC, and any further
6 discussion is "out of time" (Weber Rebuttal Statement 1-R p.32, 1-12).

7 **HOW DO YOU RESPOND?**

8 In fact, no governmental entity has approved the policy that was created by PJM, and
9 even if they had, it is entirely appropriate that the PUC consider the best interests of
10 the citizens of Pennsylvania. Moreover, Mr. Herling's detailed descriptions of the
11 market efficiency calculations, the history of the process, and references to FERC
12 proceedings have led to new insights into the project. These are discussed below.

13 **PLEASE DESCRIBE THE POLICY**

14 In their 2014 FERC filing, ER14-1394-000, PJM proposed a change to the way
15 market efficiency projects are evaluated. PJM members were frustrated by the fact
16 that few large projects were passing the metrics of their old formula[1]. So they
17 proposed relaxing the rules so that more projects would pass. Mr. Herling
18 summarizes the technical changes in his rebuttal testimony at p12. Projects continued
19 to be categorized into tiers, based primarily on voltage ("Regional / Necessary Lower
20 Voltage / and Lower Voltage"). But there were many changes to the evaluation of

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1 "PJM has not identified one market efficiency project for Regional Facilities " - AEP Comments to FERC filing ER14-1394 regarding changed to Market Efficiency at https://elibrary.ferc.gov/idmws/common/downloadOpen.asp?downloadfile=20140324%2D5000%2829217676%29%2Epdf&folder=6882890&fileid=13489805&trial=1 page 4.

projects in those tiers, and what is not clear from his rebuttal testimony is the implication of the changes.

The following new information is derived from the FERC case (ER14-1394) introduced by Mr. Herling.

YOU STATE THAT THE RULES WERE "RELAXED." PLEASE REVIEW THE CHANGE.

In order to allow more projects to clear the benefit/cost ratio ("B/C") limit of 1.25, PJM changed the way benefits were calculated.

For large Regional projects[2], the benefit calculation was changed so that the net change in Total Energy Production Cost ("TEPC") was reduced from a 75% factor to a 50% factor. The Load Energy Payment ("LEP") was increased from 25% to 50%, and importantly, the LEP was redefined to include only those zones that saw decreases in their projected costs.

The change to smaller Lower Voltage projects was even more drastic. The TEPC was dropped completely, moving from a 75% weighting to 0%, and the LEP was increased from 25% to 100%.

Identical changes were done to the factors defining the capacity market, namely the Total System Capacity Cost ("TSCC") and the Load Capacity Payment ("LCP").

2 PJM Tariff, Schedule 12, section (b)(i).

WHAT WERE THE IMPLICATIONS OF THESE CHANGES?

The implications of this change are the primary reason that this project is still being proposed by PJM today. Before this change, the benefit side of the B/C ratio was 75% based on the benefit across the entire PJM footprint (PJM uses the word "socialized.") If a proposed project, such as the IEC, resulted in lower-rate "winners" and higher-rate "victims", 75% of the calculation was made on the basis of netting the winners against the victims. After the change, 100% of the calculation for Lower Voltage projects, and 50% of the calculation for Regional projects, is based solely on the savings to the "winners", without consideration to the higher rates incurred by the "victims."

WHAT IS THE IMPLIED POLICY IN THESE CHANGES?

PJM has invented a policy that states that all rate-payers are entitled to the same rates. If moving power at voltages below 345kV (ie., a Lower Voltage project) from zone A to zone B results in a cost to A (the "victim") and a benefit to B (the "winner"), PJM justifies the project solely on the benefit to the winner. The cost to the victim is ignored.

PJM'S 2007 FERC FILING BORROWED HEAVILY FROM MISO'S PROCESSES. IS THIS POLICY COMMON IN RTO MARKET EFFICIENCY ANALYSIS?

It is not common, and may be unique. MISO, for example, only uses Adjusted Production Cost (APC) netting cost savings across all zones.[3] They do, however,

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3 MISO Attachment FF https://cdn.misoenergy.org/Attachment%20FF240221.pdf at p. 55.

1 allocate costs of any projects to beneficiaries (MISO Attachment FF III.A.2), in
2 accordance with FERC 1000 guidance.[4]

3 **HOW DID PJM JUSTIFY THE CHANGES?**

4 They stated in their FERC filing, and in Mr. Herling's rebuttal (p. 13) that limiting the
5 analysis of benefits to the "winners" was appropriate because those were the
6 customers paying for the project.

7 **IS THIS A VALID JUSTIFICATION?**

8 No. Would it be valid to rip the heart from a living victim, simply because the
9 benefit to the transplant recipient outweighed the cost of the surgeon? The painful
10 cost to an unwilling donor is at least as valid as the cost of the surgeon, just as the rate
11 increases to unwilling ratepayers are as valid as the cost of construction is to those
12 who pay that cost. The costs and benefits to all parties should be considered.

13 **WHY DID PJM INTRODUCE THIS JUSTIFICATION?**

14 PJM knew that FERC was sensitive to their FERC Order 1000 mandate that costs of
15 upgrades should be passed ONLY to those who saw the benefits of those upgrades.[5]
16 By stating that they were aligning benefits and costs, a casual reader might assume
17 that PJM was following FERC intent. In fact, the policy has the effect of harming
18 people affected by a new project. The harm comes from rate increases that arise from

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4 An overview of FERC 1000 guidance is available at https://www.ferc.gov/media/news-releases/2011/2011-3/07-21-11-E-6-presentation.pdf . Page 13 presents the six cost allocation principles including number two "Those who do not benefit from transmission do not have to pay for it." A more detailed description is available in the commissions orders: Transmission Planning and Cost Allocation by Transmission Owners and Operating Public Utilities, Order No. 1000, III FERC Stats. & Regs., Regs. Preambles ¶ 31,323 (2011), order on reh'g and clarification, Order No. 1000-A, 139 FERC ¶ 61,132, order on reh'g and clarification, Order No. 1000-B, 141 FERC ¶ 61,044 (2012) (collectively referred to as "Order No. 1000")

5 See PJM cover letter for ER14-1394 dated 2/28/14 page 4, referencing order 1000 cost allocation principles: https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13473880

1 market forces instead of a cost of construction. But at the end of the day, they are still
2 rate increases caused by the project, and they still harm those who see no benefit.

3 **HAS THE POLICY BEEN APPROVED BY FERC?**

4 Certainly not. Despite Mr. Herling's testimony to the contrary (Rebuttal Statement 7-
5 R, p.14, 13), FERC simply accepted the 2014 filing. In fact, FERC goes even further
6 in their Letter Order, "This acceptance for filing shall not be construed as constituting
7 approval of the referenced filing."[6]

8 **WERE THERE OTHER CHANGES TO THE MARKET EFFICIENCY**
9 **CALCULATION?**

10 Yes. There was another more subtle change made in the 2014 FERC filing. PJM
11 changed the metric so that all generators with a Facility Service Agreement ("FSA")
12 would be included in the modeled generation.[7] They also introduced language
13 assuring that all FSA's could be represented in the calculations, by assuming any
14 necessary "transmission enhancements to address congestion that arises from such
15 modeling." (OA 1.5.7(i)(vii)) The inclusion of "transmission enhancements" is
16 noteworthy, because there appear to be no limitations on the assumptions PJM can
17 make in order to make FSA capacity available.

18 **WHAT IS AN "FSA"?**

19 A Facility Service Agreement (in some PJM documents, a Facility Study Agreement)
20 is one of the preliminary steps a potential generation facility goes through with PJM.
21 Only 36% of FSA plants reach production.[8]

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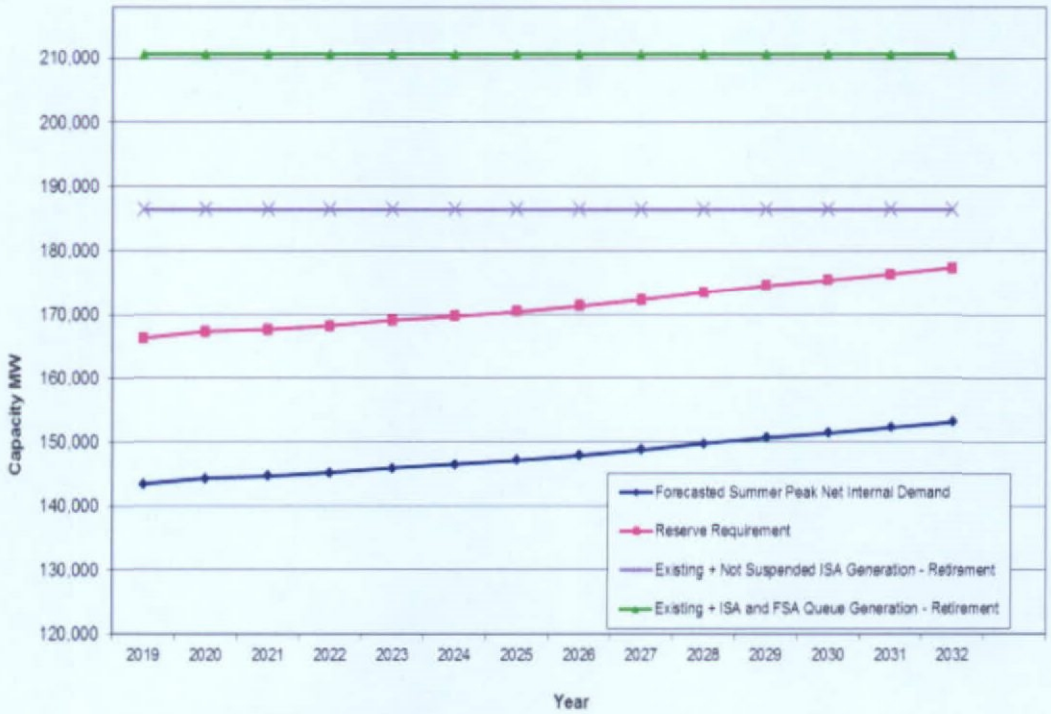
6 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13524152
7 The marked tariff changes proposed in ER14-1394 are available at https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13473881 . FSA changes are on page 16.
8 https://www.rtoinsider.com/pjm-market-efficiency-111353/ (FERC OKs PJM's Market Efficiency Rule Changes).

HOW MUCH EXTRA GENERATION DOES THIS ADD TO THE MODEL?

As can be seen in the figure below[9], including FSA generation causes a huge increase in the generation available for simulation in the market efficiency metric. In 2019, the inclusion of FSA (and suspended/interim ISA) capacity means that PJM is modeling 65MW worth of generation *above* the forecasted summer peak, a number which represents a cushion of approximately 45% over peak load, and 25% over the reserve requirement.

Figure 2 - PJM Market Efficiency Reserve Margin (with Uniform Expansion)



Note: Generation Includes existing and projected PJM internal capacity resources.
Model informed by 2023 Machines List.

9 https://www.pjm.com/-/media/committees-groups/committees/teac/20181011/20181011-2018-market-efficiency-analysis-assumptions.ashx

Illustration 1: Taken from "PJM Market Efficiency Scope and Process Assumptions: https://www.pjm.com/-/media/committees-groups/committees/teac/20181011/20181011-2018-market-efficiency-analysis-assumptions.ashx"

WHAT IS THE EFFECT OF ADDING THE FSA AND ASSOCIATED UNAPPROVED TRANSMISSION ENHANCEMENTS TO THE GENERATION CAPACITY?

Because PJM uses a complicated simulator to come up with the benefits, it is not possible to quantify the effect without running analysis through PROMOD. However, we can be fairly certain that 1) the current capacity market is saturated with generation that is not cost effective[10]; 2) only those facilities that are efficient enough to clear the market would bother to pursue an FSA; 3) those plants would very likely have a lower cost than much of the current inventory; 4) those lower costs would be dispatched in the simulation instead of higher cost existing plants, and would decrease the cost of power. This would have the effect of showing large cost savings associated with the project, when in fact, the cost savings are related to the assumption of FSA availability.

DO OTHER RTO'S INCLUDE FSA'S IN THEIR MARKET EFFICIENCY TRANSMISSION ANALYSIS?

I have not examined all RTO's. But MISO, for example, not only excludes FSA plants, but requires a CPCN (or equivalent) before the generator is included in the model.

10 For example, https://energynews.us/2018/01/31/southeast/pjm-changes-would-help-subsidized-coal-nuclear-compete-on-market/ : "Regional grid operator PJM wants to change how it sets energy and capacity prices in ways that could bolster uneconomic coal and nuclear plants."

DOES PJM PROPOSE CHANGES TO THE FSA INCLUSION?

Yes. They are aware of the problems of including FSA generation in market efficiency planning. In fact, they are in the process of asking FERC to change the market efficiency calculation to exclude FSA's. A team at PJM has been working on these changes, and states "Given that many of the projects with an executed FSA or suspended ISA may not ultimately interconnect with the system, *including them in Market Efficiency Base Case can result in unrealistic estimates of specific project benefits* due to having significantly more generation than the reserve requirement or unlikely to be constructed generation available in the Market Efficiency simulations." [emphasis added].[11] [12]

It is entirely possible that if this project were evaluated under future-planned rules that simply eliminate the assumption of FSA-available power, the project would not achieve its required B/C ratio. Discovery is still pending.

HAVE THOSE CHANGES BEEN MADE TO EXCLUDE FSA'S FOR ANALYSIS ON THIS PROJECT?

No. The IEC is being modeled differently than future market efficiency projects. PJM did not calculate the benefit of the IEC with FSA plants excluded.

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11 https://www.pjm.com/-/media/committees-groups/task-forces/mepetf/20180518/20180518-item-03b-facility-service-agreement-modeling-package-a-executive-summary.ashx

12 Also, slide 13 in Kamran Ali's attachment to his rebuttal testimony: KA-1R

MR. HERLING MENTIONS THAT THE CURRENT MARKET EFFICIENCY FORMULA VARIES BY THE VOLTAGE OF THE PROJECT. WHY DOES THE FORMULA CHANGE BY VOLTAGE?

PJM first proposed changes to the RTEP process in 2006 that would provide planners with wide latitude in determining benefit (FERC ER06-1474). In a November 21, 2006 filing[13], FERC requested that PJM explain in detail "how it will weigh, consider, and/or combine the various metrics it proposes in determining the net social economic benefits." PJM responded in an October 9, 2007 filing[14] that created the basis of today's tiers and metrics, before they were changed again in 2014.

In that 2007 filing, the only difference between big projects and small projects (as defined by Tariff Schedule 12, section (b)) was whether 30% of the benefit in large projects should include *net* changes in Load Energy Payments (increases netted with decreases), or only LEP changes for zones that showed decreased prices in smaller projects. PJM justified the difference in calculation by stating "Typically, economic-based expansions or enhancements below 500kV address local congestion issues."[15]

I note here that the PJM reference to 500kV would also apply to 345kV double circuit, as both are defined as Regional in Schedule 12 (b)(i).

Also, on page 8, PJM describes the importance of incorporating net change in production cost in large projects: "The change in production costs approximates the societal good associated with an economic-based enhancement or expansion, by

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13 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11185717
14 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11479160
15 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11479160 page 9 near bottom.

1 measuring the overall reduction in the cost of producing electricity in the PJM region.
2 The reduction in production costs is a standard measure of the economic benefits of
3 an expansion or enhancement, thus warranting significant weight when determining
4 the benefits of an economic-based upgrade."

5 **PJM ALLUDES TO "LOCAL" CONGESTION. IS THE IEC INTENDED TO**
6 **ALLEVIATE "LOCAL" CONGESTION.**

7 No. It is intended to supplement or partially replace the AP South Interface, defined
8 by PJM as a set of specifically named lines originating in West Virginia and
9 Terminating in Maryland.[16] The Doubs substation is a primary gateway in the AP
10 South, and it is located nearly 100 miles from the proposed Furnace Run station at a
11 distance that could hardly be considered "local." As a comparison, the Mt. Storm to
12 Doubs line which forms part of the AP South Interface is also nearly 100 miles.

13 **WHY IS THIS PERTINENT TO THE IEC?**

14 The IEC comprises two (2) new 230kV lines, the IEC-East and IEC-West. Both lines
15 are proposed to be bundled double circuit lines. This means that each line, east and
16 west, will carry 12 conductors. This is twice the typical number of conductors seen
17 on a double circuit. According to Transource Interrogatory 1 to PPL on 10/2/18, the
18 IEC East would be rated at 1800 MVA / 2400 MVA (normal summer/emergency).
19 But according to Shaw Interrogatory 1-01 and PJM's construction summary on their
20 RTEP baseline project list[17], the IEC-East transmission line (as opposed to the
21 limiting transformer at Furnace Run) would have a capacity of 2400MVA /

16 See the September 30, 2007 definition of the AP South Interface - https://www.pjm.com/markets-and-operations/etools/oasis/system-information/ap-change.aspx

17 https://pjm.com/planning/rtep-upgrades-status/construct-status.aspx . The IEC-East is PJM project 2752; The IEC-West is project 2743. See 2743.5 listing IEC-West at 1660/1660MVA, and 2752.5 listing IEC-East at 2400/2400MVA. Total project transfer potential of the lines is 1660+2400=4060MVA.

2400MVA. This is considerably more power than is typically seen on a double-circuit 345kV line, clearly defined by PJM as Regional. Please see schedule BTS-1 for a comparative listing of actual PJM line ratings by voltage.

Both the IEC-East and IEC-West are able to carry more power than a Regional 345kV line, and taken together, move more power than many Regional double-circuit 500kV lines, a configuration that forms the backbone of the electrical grid.

Based upon the amount of capacity in those lines, the IEC clearly qualifies as a Regional project, as Regional was initially intended.

WAS TRANSOURCE AWARE OF THE 2014 CHANGES PROPOSED BY PJM, AND THE BENEFITS OF CLASSIFYING A PROJECT AS "LOWER-VOLTAGE?"

They were very aware of the differences. Only one company offered comments to FERC on docket ER14-1394[18]. That company was American Electric Power ("AEP"), the parent company of Transource. They support PJM's proposed changes, and comment as follows:

> "The net effect of the modifications proposed in the February 28 Filing allows the PJM economic planning process to identify both higher voltage Regional and Lower Voltage market efficiency projects that will address congestion most efficiently. *The current approach results in a bias towards addressing both Regional and Lower Voltage congestion primarily with Lower Voltage projects because the NLP by benefiting zone metric was only used for the Lower Voltage projects, and thus the benefit to cost ratio for a Lower Voltage project was significantly higher for a Lower Voltage line as compared to a similar higher voltage Regional line connecting two substations.* This was illustrated during the

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18 https://elibrary.ferc.gov/idmws/common/downloadOpen.asp?downloadfile=20140324%2D5000%2829217676%29%2Epdf&folder=6882890&fileid=13489805&trial=1

> October 5, 2011, meeting of the PJM Transmission Expansion Advisory Committee, where slide 8 of the 2011 Market Efficiency Analysis Update5 shows that a 500 kV solution (Project Number MEP-B-7), with a benefit of $3 million, produced lower benefits as compared to a similar 230 kV solution (Project Number MEP-B-9), with a benefit of $822 million. *This is a counter-intuitive result, since a higher voltage project would be expected to provide greater benefits than a lower voltage project that connects similar substations.* " [emphasis added]

The comments were supporting the reduction of socialized costs in Regional projects from a 75% value to a 50% value. So even the proposal they supported continued to maintain conditions for the 'bias' that they had so adroitly identified.

WHEN WAS THE IEC INITIALLY PROPOSED?

The IEC was proposed the next year, in 2015 as part of the 2014/2015 RTEP process.

IF THE IEC WERE CLASSIFIED AS A "REGIONAL" PROJECT, HOW WOULD THE B/C CHANGE?

The benefits of the project would be subject to a 50/50 weighting of overall production cost to load energy payment. The $707M LEP benefit[19] that currently is weighted at 100%, would shrink to $353.5M. The other 50% of the weighting would be based on *net* production cost changes, a number that includes production cost increases as well as decreases. According to OCA Schedule SJR-2SR accompanying Mr. Rubin's surrebuttal testimony (Transource response to OCA XXVII-02), the estimated production-cost savings are $260 million. If the B/C were calculated using the same metric as higher-voltage projects, the B/C would likely be 0.96

19 Value taken from OCA Testimony "Rubin" 9/25/18.

($260M*0.5)+($707M*0.5)/$505[20]). In other words, the value would be calculated to be less than the cost of the project.

PLEASE SUMMARIZE YOUR ANALYSIS OF THE BENEFIT/COST CALCULATION.

The evidence stemming from the FERC filings identified by Mr. Herling shows that PJM has done everything they could possibly do to justify projects exactly like the IEC. They have:

1) Changed the rules (2007) to allow the exclusion of zones where rates increased in calculation of LEP.
2) Changed the rules (2014) to eliminate netting of production cost across all zones for Lower Voltage projects.
3) Changed the rules (2014) to include as much cheap generation in the simulation as possible (FSA's).
4) Looked the other way as Transource intentionally designed a Regional transmission system disguised as a Lower Voltage transmission system.

Only the first of these changes was explicitly approved by FERC.

All of these changes were made for one purpose only, to build more lines. Along the way, they have invented a new policy goal: equal rates for all, through ubiquitous transmission. No governmental entity has approved this policy, and it is incumbent upon the PUC to protect the citizens of Pennsylvania from its implications.

Response to Kamran Ali

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[20] The cost of the project was increased by Transource after OCA's direct testimony was completed. PJM reported the new B/C ration to be 1.40 (falling from 1.42). This implies the new AVRR cost is $505M.

IN HIS REBUTTAL TESTIMONY, KAMRAN ALI ASSERTS THAT BECAUSE YOU BELIEVE THAT GENERATOR PROXIMITY MATTERS, YOU ARE ADVOCATING A "RETURN TO A REGULATORY STRUCTURE THAT HAS NOT EXISTED FOR DECADES, WHEN INDIVIDUAL LOCAL UTILITIES ONLY INTERACTED WITH EACH OTHER ON A LIMITED BASIS." PLEASE RESPOND.

Mr. Ali is mistaken in his understanding. I understand the importance of transmission to grid resiliency, and in many cases, to supply significant amounts of power. The Conowingo Dam is nearby, and was built in 1928 by the Philadelphia Electric Company, a company that founded PJM at nearly the same time. The electricity assets of this community have been part of the larger PJM grid since the very beginning.

Mr. Ali states himself that "geographic diversity" is important (rebuttal 2-R p. 3, line 18). I'm sure he is aware that Maryland is currently importing nearly 50% of their electricity.[21] The IEC would likely increase that number as less expensive electricity from Pennsylvania displaces higher cost, local electricity generated in Maryland and Virginia. The PJM policy of eliminating price differentials through ubiquitous transmission, implies the ultimate demise of every generator in Maryland who cannot compete on a price basis with cheaper generators in Pennsylvania or elsewhere. This policy could ultimately defeat Mr. Ali's goal of geographic diversity, because nowhere in the complicated PJM market efficiency analysis is geographic diversity included as a variable. Proximity to load has no value in their market efficiency calculations.

21 PJM's 2017 Maryland and DC Infrastructure Report, published May 2018, p. 34 – Maryland imports 47.1% of electricity, and Maryland and Washington DC as a pair import 57.1% of electricity.

I also note that nowhere in the testimony has PJM shown a method whereby the consideration of new local generation is compared to the alternative of transmission. In fact, this is an important recommendation made by the independent market monitor (Monitoring Analytics). In their most recent state of the market they recommend: "the creation of a mechanism to permit a direct comparison, or competition, between transmission and generation alternatives, including which alternative is less costly and who bears the risks associated with each alternative."[22]

MR. ALI STATES THAT THE PROJECT HAS BEEN VETTED WITH REGARDS TO NATURAL GAS PRICE VARIATIONS, AND THAT YOU BELIEVE THE USE OF PROMOD IS INAPPROPRIATE. PLEASE RESPOND.

I will address both misunderstandings together.

In my Testimony, I introduced the concept of probabilistic decision making and its importance in large, expensive decisions like the IEC. Just because we live in an uncertain world does not mean that decisions cannot be optimized. There is nothing certain about the future; however, there are scientific tools used every day by organizations around the world to model that uncertainty.

A tenet of decision theory holds that if probabilities of future events can be determined, and if we know the effects of those events and can assign a "utility" to those end states, we can assign an expected utility to the current state from which future events may evolve.

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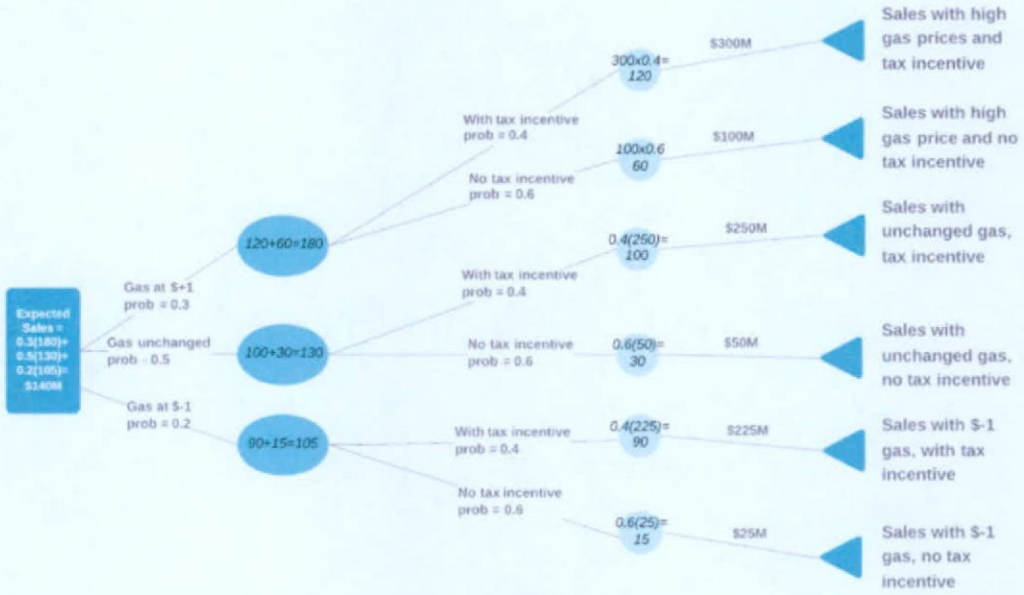
22 Monitoring Analytics State of the Market 2018, Section 12, p. 590 - http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2018/2018q3-som-pjm-sec12.pdf

CAN YOU PROVIDE A SIMPLE EXAMPLE OF HOW THIS WORKS?

Yes. Consider a car company considering the introduction of a new hybrid vehicle. The company foresees two factors that would greatly impact the sales of their car, namely the price of gasoline and the presence of a consumer tax incentive to encourage hybrid sales. They believe that there is a 40% chance of the tax incentive, and that a tax incentive will result in a $200M boost to sales. They model the probabilities of future gas prices, and their associated impact on sales by using the values below:

Gasoline Price Change	$ Sales at that gas price	Probability
$+1	100M	0.3
$0	50M	0.5
$-1	25M	0.2

The expected value of sales can be determined by finding the joint probabilities and weighing against the end state. A tree makes the calculations easy to see. Calculations are made from right to left.



The analysis shows that a risk-neutral assessment of sales would be $140M. This decision analysis uses joint probability to assess the effects of expected events or scenarios. Note that individual probabilities or end states could easily be varied independently; for example, if there were reason to believe that a tax incentive *with* a gasoline increase would cause even higher sales, the $300M value could easily be increased, and the expected sales would change accordingly.

HOW IS THIS DIFFERENT FROM SENSITIVITY ANALYSIS USED BY PJM?

Sensitivity analysis allows the changing of exactly one parameter to find the results of that change. It does not include effects of probability nor does it consider the effects of coincident events, for example a rise in distributed electricity generation (e.g., solar) coincident with a natural gas extraction tax in Pennsylvania.

MR. ALI STATES THAT THE IEC HAS ALREADY UNDERGONE SENSITIVITY ANALYSIS AND PASSED THE TEST (ALI REBUTTAL P. 9) HOW DO YOU RESPOND?

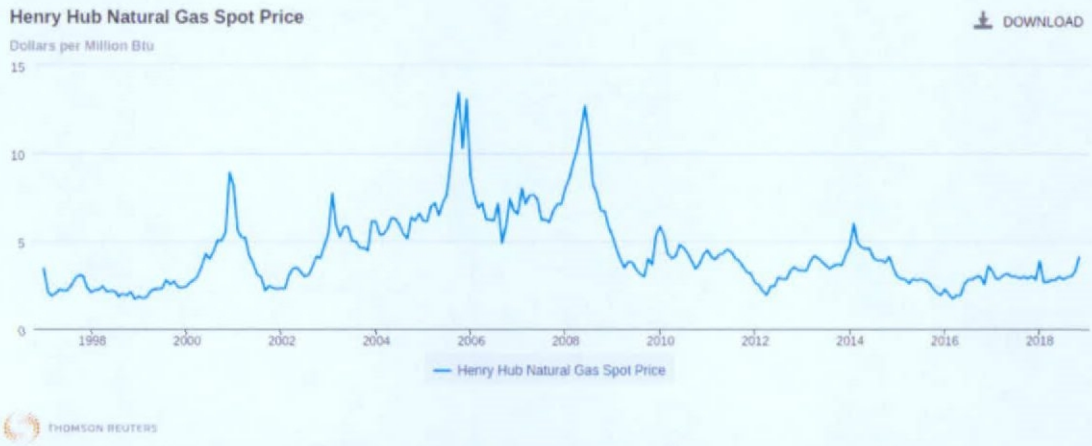
There is nothing in the PJM documentation that says when a sensitivity analysis must be performed, or identifying all the variables that must be adjusted and to what degree. I only note that PJM documented sensitivities for natural gas while the project was performing at a higher B/C ratio. The most recent sensitivity analysis I am aware of was the analysis presented at the August 2, 2016 TEAC meeting. In that analysis, $+1 natural gas sensitivity decreased the B/C ratio by 0.4. As the B/C ratio of the project has diminished and settled below 1.5 in late 2017, there have been no sensitivity studies published. But even if they had done this analysis, they have no way to include those results in a "weighted" B/C because their methodology does not include weighted joint probability techniques.

Not only was the timing of PJM's sensitivity analysis work skewed, but the types of sensitivities seemed to be selected to make the project appear more attractive. For example, at the June 9, 2016 TEAC meeting, PJM showed results from a new sensitivity: Natural Gas at $-2.[23] The resulting B/C ratio soared to 4.9, nearly double the baseline case. But at that time, gas was near a record low price. The probability of a $-2 gas was nearly 0 because according to Henry Hub Spot Price History, the May price of gas was only $1.92/MBTU.[24] The higher probability of $+2 gas was

23 https://www.pjm.com/-/media/committees-groups/committees/teac/20160609/20160609-market-efficiency-update.ashx

24 https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm

not tested. The graph below illustrates the timing of sensitivity analysis with gas prices.



PJM executes ($-2) gas sensitivity at time of near-record low gas price in 2016.

MR. ALI, MR. HERLING, AND OTHERS HAVE TESTIFIED THAT THE PJM PROCESS INCLUDES FORECASTS THAT ACCOUNT FOR MULTIPLE CONTINGENCIES, INCLUDING NON-TRANSMISSION ALTERNATIVES, FUEL PRICES, ETC... DO THESE FORECASTS ACCOUNT FOR THE RISK YOU MENTION?

No. The PJM process attempts to interpolate existing trends and behaviors. Mr. Herling describes in his rebuttal (p. 30-32) how the forecasts are prepared, either by outside sources or by PJM resources. But in almost all cases, the forecasts fail to consider any step changes resulting from public policy changes[25], new technology, new taxation, recession, new pipelines to destination markets, etc... Mr. Herling accurately summarizes the PJM approach, "PJM does not include speculative projections in its forecast." (Herling rebuttal 7-R p. 30, line 11.) And since the

25 Example, OCA XXIII Data Request 02 describing Dominion Energy's Grid Transformation Program in response to Virginia's GTSA legislation.

forecast is the only way in which variables are input into PROMOD and the PJM calculations, PJM has no way of incorporating the effects of events that might greatly impact the B/C ratio of the project. This is not a risk-neutral approach towards decision making.

WHY ISN'T THE USE OF PROMOD SUFFICIENT?

PROMOD is a very powerful tool, and I do not suggest that it should be eliminated. On the contrary, it is necessary to understand the impacts of future states. My point is that the current use of PROMOD serves to only model one future: a future that is unlikely to be exactly true. A better decision process would use it as a tool in the context of joint probability, or risk-weighted futures.

IS THIS APPROACH JUST A THEORY, OR ARE THERE OTHER REGIONAL TRANSMISSION ORGANIZATIONS ("RTO'S") THAT INCLUDE THIS TECHNIQUE?

Yes. For example, MISO uses a simple probabilistic technique that includes "weighted futures" in its market efficiency evaluation methodology[26]. Scenarios are constructed to represent future events, probabilities are assigned, simulations are performed, and a final score is created by utilizing these scenarios with their probabilities.

26 MISO Market efficiency descriptions and calculations may be found at https://cdn.misoenergy.org/Attachment%20FF240221.pdf. Reference to weighted futures begin on page 55 of the pdf. Weighted futures are described as the first step in analysis, before any description of benefit calculation or costs.

CAN YOU ELABORATE ON THE MISO APPROACH AND THEIR USE OF PROBABILISTIC ANALYSIS?

The MISO approach currently consists of four different scenarios ("futures"), that they weigh in combination with each other.[27] These scenarios include futures with Limited Change Fleet, Continued Fleet Change, Distributed & Emerging Technologies, and Accelerated Fleet Change. Each of these futures makes different assumptions about key model input variables. For example, the Distributed and Emerging Technologies future includes an assumption of more distributed solar and micro-grid market penetration, increased Wind & Solar and storage devices, and increased usage of demand-response.

The variables that impact the PROMOD simulation are changed in each of the modeled futures. For example, the Accelerated Fleet Change future assumes lower future costs of solar and wind, higher market adoption of demand response and energy efficiency, and a higher rate of retirement.

In the 2019 year, MISO anticipates that each of these futures will be weighted equally, but in other years, they may elect to weigh them with different probabilities.

WHY IS IT RELEVANT TO DISCUSS THIS TECHNIQUE AND POINT OUT THAT MISO USES IT AS PART OF THEIR MARKET EFFICIENCY SELECTION PROCESS?

Even if the current selection process used by PJM were approved by FERC, which it is not, it is entirely appropriate for the PUC to evaluate this process to determine

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27 A detailed description of the MISO "weighted futures" approach is available at https://cdn.misoenergy.org/20180613%20PAC%20Item%2003a%20MTEP19%20Futures219515.pdf

whether it is leading to projects that benefit us all. Mr. Ali states that the evaluation of the IEC is "dependent on a number of factors", and the "complexity of this factor interdependence is the reason it is necessary to conduct specialized analysis" (Ali Rebuttal 2-R, p. 9, 14-16). PJM's "specialized analysis" methodology is heavy on PROMOD simulation, but devoid of risk-weighted analysis. The lack of a process to quantify the contribution of even the limited benefits of sensitivity analysis speaks to the weakness of the current process.

The economics of the IEC are already thin. Ignoring future events and scenarios that may make it unnecessary would be unwise. It is entirely appropriate for the PUC to consider whether PJM's decision methodology is robust, and protects the interests of Pennsylvania, and all of our neighbors, in an uncertain future.

Response to Mr. Cawley

MR. CAWLEY TESTIFIES AT LENGTH THAT PENNSYLVANIA RATEPAYERS SHOULD BE WILLING TO PAY MORE IN ORDER TO SUPPORT LOWER RATES ELSEWHERE, FOR PURPOSES OF THE COMMON GOOD. YOUR RESPONSE?

Mr. Cawley provides no evidence that either the ratepayers or the Maryland Public Services Commission are in favor of the IEC. Direct testimony in Maryland is due after the evidentiary hearings are completed in Pennsylvania, therefore it is impossible to state definitively whether Maryland regulators (e.g., MD Office of People's Council, MD Power Plant Research Program, etc...) are in favor of the IEC.

1 What we do know so far is that the PPRP has made a motion to dismiss the case[28],

2 and MD Governor Hogan has asked PJM to stop the project[29].

3

4 It is irrational to exclude the costs to Pennsylvania ratepayers. It is even worse to

5 approve a project that the beneficiaries specifically reject.

6 ***Response to Mr. Baker***

7 **MR. BAKER SUGGESTS THAT OTHER ORCHARDS AND FARM MARKETS**
8 **EXIST WELL WITH POWER LINES. HE MENTIONS SEVERAL. CAN**
9 **YOU BRIEFLY DESCRIBE THEM?**

10 Distinctive Gardens is a small nursery that sits on no more than a couple acres nestled

11 against a hillside. Their business has little similarity with my orchard in that they are

12 not an agritainment destination, they do not sell produce, and no one goes there for

13 the view. A comparison to this venue is irrelevant.

14

15 Kohler Farms and Highland Orchards are located in affluent suburbs of Philadelphia.

16 Solebury Orchards is located near Doylestown, approximately one mile from New

17 Jersey.

18

19 **HAVE YOU SPOKEN TO ANY OF THESE ORCHARDS?**

20 The only good thing about this project is that I have come to know my neighbors a

21 little better, and surprisingly, this extends to fellow growers miles away. I visited

22 Highland Orchards in West Chester on December 3, 2018, and had a subsequent

23 phone discussion with owner Alan Hodge.

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28 http://webapp.psc.state.md.us/newIntranet/casenum/submit_new.cfm?DirPath=C:\Casenum\9400-9499\9471\Item_34\&CaseN=9471\Item_34

29 https://www.pjm.com/-/media/about-pjm/who-we-are/public-disclosures/20180828-gov-hogan-transource-july-2018-letter-to-pjm-board.ashx?la=en

1 **PLEASE DESCRIBE THE AREA AROUND HIGHLAND ORCHARDS**

2 Highland Orchards has coexisted with a high voltage line since 1957. Few, if any, of
3 their customers can remember a time before the line. The orchard was begun long
4 before urban sprawl reached it. In the years since, the area has become developed.
5 There are numerous developments near the property, including communities with
6 densities exceeding 10,000 people per square mile, and one community with a density
7 over 25,000 people per square mile.[30] In fact, according to freemaptools.com, in a 15
8 mile radius of Highland, there are approximately 433,307 people[31]. Chester County
9 is the most affluent county in Pennsylvania with a median family income of
10 $101,760.[32]
11
12 **IS THIS POPULATION HELPFUL FOR HIGHLAND?**
13 Yes. People in this density long for a place nearby to feel like they are in the country.
14 They have money to spend, and very few local options for authentic farm produce in
15 proportion to the population.
16
17 **HOW DOES THIS HELP HIGHLAND?**
18 Highland can command a premium for their product. For example, they can get $28
19 for a half bushel of pick-your-own apples. I get $18. But more importantly, because
20 of the large local population, Highland can sell all of their apples directly to
21 customers at these prices.

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30 https://www.arcgis.com/home/webmap/viewer.html?webmap=db17469454894e159d882b1ed4b0aebf for Highland Orchards
31 https://www.freemaptools.com/find-population.htm . Population estimate only.
32 https://en.wikipedia.org/wiki/List_of_Pennsylvania_counties_by_per_capita_income

1

2 **WHAT DOES MR. HODGE HAVE TO SAY ABOUT THE POWER LINES?**

3 He was surprised to know that his farm had been mentioned by Transource as part of

4 this case, but he was happy to talk to me about the lines.

5

6 He does not like the lines. He says that they have limited the ability of the farm to do

7 any development over the years, and limited the value of his property significantly

8 compared to neighbors.

9

10 With regards to his orchard, he said "they are a thorn in our side." And referencing

11 the social media aspect, "they show up in every selfie!" With regards to planting, he

12 mentioned that their presence affects the orientation of crops, and the rotations that

13 can be made under them.

14

15 **PLEASE SUMMARIZE THE EXAMPLES GIVEN BY MR. BAKER**

16 Though Mr. Baker and Transource apparently did not contact any of the orchards to

17 assess their profitability, it is possible that these farms are sustainable. However, I

18 submit that any prosperity they experience has more to do with the enormous

19 surrounding population of affluent people. This is the perfect target for a fresh,

20 experiential agricultural experience.

21

22 **IS SHAW ORCHARDS IN A SIMILAR MARKET?**

23 No. South Eastern School District is one of the largest geographical districts in York

24 County encompassing over 100 square miles, and doesn't even have a stoplight. The

25 nearest stoplight in Maryland is in Madonna, approximately ten miles away. Our

area of York and Harford County is not wealthy. Unlike the orchards in Chester County, our orchard is not a stark contrast to our nearby neighbors; instead, it blends in as part of the rural countryside. Many, if not most, of our pick-your-own customers travel a long distance to find our farm. They come for the experience, and the IEC would detract from that experience.

MR. BAKER STATED IN HIS REBUTTAL (P. 9, LINE 1) THAT "COST OF LAND IS NOT A FACTOR." PLEASE RESPOND.

I do not believe this is the conventional wisdom of the industry, nor the case for the IEC. PJM's own training Powerpoint document, "Power System Fundamentals" from 2015 (the same year the IEC was designed), describes the basics of Transmission Line Equipment. It states, "Generally, the right-of-way is determined by the path of least cost to construct the line, considering: the cost of real estate, population density, bodies of water...", etc... ("Power System Fundamentals" page 35[33]).

BASED ON RECENT DISCOVERY RESPONSES, DO YOU HAVE ANOTHER EXAMPLE OF HOW PJM FAILED TO INCORPORATE RISK APPROPRIATELY?

Yes. PJM was aware that a pair of Maryland generators, Chalk Point and Dickerson, had a large effect on the benefit analysis. PJM created a sensitivity analysis for this event called "Gen Sens." Those generators were scheduled to retire, but PJM found that if they did not retire, the B/C ratio would fall from 2.48 to 2.2. On February 29, 2016, PJM posted information indicating that the shutdown application had been withdrawn. However, at the board presentation on August 2, 2016, there is no indication that the TEAC informed the board that the Gen Sens scenario now

33 https://www.pjm.com/-/media/training/nerc-certifications/gen-exam-materials/psf/20160104-pwr-sys-fund-transmission-facilities.ashx?la=en , page 35.

1 included the most likely conditions. It is very possible, and in fact likely, that the
2 PJM board made their decision based on faulty assumptions that should have been
3 known to members of the TEAC. Subsequent re-evaluations of the Project 9A have
4 appropriately included the Chalk Point and Dickerson plants. This is one reason that
5 the benefits of the project have fallen.

6 **DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?**

7 Yes.

Shaw Surrebuttal Attachment 1
Table of Line Capacities

The following capacities have been taken from publicly available sources.

Line Name	Voltage	Normal/Emergency Capacity (MVA)	Source
Altoona-Johnstown	230kv	488/554	ftp://www.pjm.com/planning/project-queues/feas_docs/i02_fea.pdf
Graceton-Bagley	230kv	659/800	ftp://www.pjm.com/planning/project-queues/impact_studies/u4005_imp.pdf
Bagley-Raphael	230kv	659/800	ftp://www.pjm.com/planning/project-queues/impact_studies/u4005_imp.pdf
Salta-Atacama (bundled, single circuit)	345kv	700	https://www.modernpowersystems.com/features/featuresalta-atacama-345-kv-transmission-line-takes-power-across-the-andes/
Sammis-Star	345kv	950	https://www.ferc.gov/industries/electric/indus-act/reliability/blackout/ch5.pdf
Transource IEC-East	230kv	1800/2400	Transource Int'rg. #1 to PPL
Transource IEC-West	230kv	1600/1600	https://pjm.com/planning/rtep-upgrades-status/construct-status.aspx
Peach Bottom-Conastone	500kv	2338 (base case, non-contingency)	ftp://ftp.pjm.com/planning/project-queues/impact_studies/ab2055_imp.pdf
Kempton-Emory	500kv	2338	ftp://pjm.com/planning/project-queues/feas_docs/x2076_fea.pdf

Line Name	Voltage	Normal/Emergency Capacity (MVA)	Source
Susquehanna – Roseland	500kv	2500/3000	https://www.psegtransmission.com/sites/default/files/file/files/mccarter_switching_station/filings/khadr_testimony.pdf
Combined IEC	230kv	**3400/4000**	(see IEC above)

VERIFICATION

I, Barron Shaw, hereby state that I submitted Surrebuttal Testimony on behalf of Barron Shaw and Shaw Orchards and that the facts set forth in this document are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Barron Shaw

Date: February 25, 2019