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***Memorandum***

To: Brian Groth

From: Rakesh Kothakapu

Date: May 20, 2025

Re: Summary of Transmission Charges to Load in PJM

Brian,

You asked me to determine transmission costs if they had been charged to Naperville directly by PJM as compared to the IMEA Transmission rate derived from the red/blue bar chart presented in the February IMEA Board meeting. To answer this question, I will use data from the most recently completed IMEA fiscal year 2024 for which data is available, Fiscal Year (FY) 2024 represents (May 1, 2023, through April 30th, 2024)

## I. Background:

IMEA's Red bar for the transmission costs represented in FY24 was ~$13/Megawatt Hour ("MWH"). Using $13/MWH, a simple calculation from IMEA transmission charges represent approximately ~$16.2 million. (1,252,093 MWH times $13=$16,277,209).

## II. PJM Transmission Charges Calculation:

Staff attempted to calculate PJM Transmission charges as accurately as possible, to model the hypothetical as if Naperville was not part of IMEA. We attempted to calculate Naperville's Transmission charges under the proposed hypothetical as accurately as possible using publicly available data from PJM. There are two key elements to this calculation: Peak Load Contribution ("PLC"), and Total Energy Consumption ("TEC"). In FY24, Naperville's PLC was 340 Megawatts (MW"), and its TEC was 1,252,093MWH.

BELOW IS THE SUMMARY OF COMED/PJM TRANSMISSION CHARGES NAPERVILLE IS SUBJECTED TO. THIS IS NOT AN EXHAUSTIVE LIST. THERE ARE ADDITIONAL CHARGES AND CREDITS THAT ARE PART OF THE EQUATION. HOWEVER, FOR SIMPLICITY, THIS LIST SERVES TO SUMMARIZE THE 5 COMPONENTS THAT MAKE UP THE MAJORITY OF THE CHARGES.

1) ComEd charges a Network Transmission Rate ("NTR") to all ratepayers for the cost of wires. This ComEd Rate for January 2024, was $39,796 MW-YEAR ("MWY") (Annual Transmission Revenue Requirements and Rates Posting.xlsx)

a) Network Transmission cost is equal to the NTR multiplied by the PLC
   a. $39,796MWY times 340MW = $13,530,640
b) It should be remembered that transmission charges are based on an annual, not monthly, peak load. This means that for the months that the city's peak load is less than 340MW, the charge for transmission is still based on the 340MW annual peak load
***c) <u>This singular base charge contributes to over 83% of the $16.2M noted above</u>***

2) PJM charges all ratepayers, including those in the ComEd region, for Regional Transmission Expansion Projects ("RTEP"). This cost is allocated based on the transmission project's usefulness for each region. RTEPs are projects designed to boost reliability that PJM develops across multiple "zones" within its footprint. Charges as well as credits are zone-specific. In FY24, PJM posted a ComEd Charge of $3,915.67/MWY and a ComEd Credit (credit is based upon a previous FERC settlement) of $1,329/MWY. (https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/mss/postings/2025/transmission-enhancement-worksheet-march-2025.xlsx). The calculation for RTEP cost is equal to the difference between the Charge and the Credit, which is subsequently multiplied by PLC.
   d) RTEP Cost = ($3,915.67-$1,329) MW-Year times 340MW = $879,468
3) ComEd charges a Wholesale Distribution Service ("WDS") for non-Network transmission equipment used by Naperville: Per PJM Tariff attachment H-13. The cost to Naperville attributable to WDS is $58,540.79/Month. [***<u>See attached H13 PJM Tariff document</u>***]
   e) $58,540.79 times 12 months = $702,489/Year
   f) It is not commonly known that towns within ComEd, such as Naperville, are required to pay for Wholesale Distribution Facilities under the ComEd tariff. This charge would be paid to PJM regardless of the power supplier.
4) PJM load must pay generators for Reactive Power. Also known as "Grid Voltage Support", this is a component critical to the overall functioning of the electrical grid and is a charge part of PJM's Transmission Schedule. (See ComEd Revenue requirement https://www.pjm.com/-/media/DotCom/markets-ops/settlements/reactive-revenue-requirements-table-march-2025.xls). This charge is equal to the remainder of Naperville's ComEd Load Revenue ("LR") ($52.4MM) divided by ComEd's total peak load (~21,000MW) which is then multiplied by Naperville's PLC
   Reactive Power = ($52,400,000/21,000) times 340 = $848,381
5) Charges PJM collects for various PJM related activities. Scheduling and dispatch (PJM Charges) ***<u>[See attached snapshot from PJM Data Miner]</u>***
   g) Schedule 9-1 ($0.300864/MWH), Schedule 9-3 ($0.048842/MWH), Schedule 9 FERC ($0.1346/MWH), Schedule 9 OPSI (0.0012/MWH), Schedule 10-NERC ($0.0204/MWH), Schedule 10-RFC ($0.0295), Schedule 9-MMU ($0.0071/MWH), Schedule 9-CAPS ($0.0006/MWH), Schedule 9-PSI (9-1) (0.00189/MWH), Schedule 9-PSI (9-3) (0.000816/MWH), Schedule 1A ComEd ($0.2223/MWH)

The sum of these charges, \$0.768112/MWH, is multiplied by Naperville's TEC 1,252,093 MWH to calculate the total cost.

\$0.768112 * 1,252,093 = \$961,747.66

To those that are unfamiliar with the complexity of how transmission costs are determined, these line items might not seem like Naperville would need to pay, but every PJM customer pays them. These costs, like those associated with RTEP, while somewhat obscure, are mandated by PJM Tariff, regardless of power supplier.

III. Summary:

The sum of the five PJM charges calculated through publicly available data is equal to \$16.9MM, which is roughly in line with IMEA's transmission charges of \$16.2M for Naperville.

| PJM Charge Type | PJM Charges |
|---|---|
| Network Transmission Rate ComEd | \$ 13,530,640 |
| Regional Transmission Expansion Projects | \$ 879,468 |
| ComEd Wholesale Distribution service | \$ 702,489 |
| Reactive power, voltage support | \$ 848,381 |
| Scheduling and dispatch (PJM Charges) | \$ 961,748 |
| Total of 5 Charges | \$ 16,922,762 |

As you can see, there is ***no material difference between IMEA transmission rates and PJM charges that Naperville would pay if it were not part of IMEA***.

To address the issue of transmission costs per MWH, as you can see, several transmission costs are fixed in nature based on Naperville's annual peak load. If the load factor (Average load MWH/Peak load MW) goes down, then the cost per MWH will be higher. Similarly, if the load factor improves then the average cost per MWH will be lower. As a result, the annual city load factor becomes an important aspect when comparing rates. Using the data above 1,252,093 divided by 8760 hours in a 365-day year, Naperville's average load is 142.9MW for each hour, with a peak of 340MW.

That leads to an ***approximate annual load factor of 0.42***. This information is very relevant on how the average cost per MWH should be compared for similar supply arrangements.

Finally, I would like to address the impact of Transmission Rates as it relates to Pseudo-ties. (IMEA pseudo-ties Prairie State from MISO into PJM to serve your load.) FERC entered a rate de-pancaking order when ComEd Joined PJM and, as a result, there are no network or Point-to-Point transmission charges paid for by IMEA to deliver these generators to PJM/COMED. This is true for Trimble County as well, when the LG&E utility left MISO to become its own region (not part of either RTO), FERC ordered de-pancaking of rates. As a result of both these orders, IMEA does not pay any additional Network or Point-to Point transmission charges in either PJM or LG&E. Rate pancaking occurs when electricity is scheduled across more than one transmission provider's borders, leading to duplicate transmission fees between the multiple transmission providers.

While this memo is a high-level simplified answer, there is one complex topic worth highlighting. The only change relates to Pseudo-ties (Credit or Charge) stems from the fact that PJM generates the Locational Marginal Price for the Prairie State Pseudo-tie unit. It must take account of congestion (Credit or Charge) in MISO. ***This portion of the congestion costs or credits related to the delivery of Prairie State from MISO to PJM are captured and tracked by IMEA as energy related costs and is not charged to the Transmission accounts.*** The Prairie State related congestion costs or credits are determined based on the financial settlement of flows of electricity between PJM and MISO. This occurs since PJM and MISO settle financially in real-time through M2M Exchange (M2M Data Exchange Summary of Data Exchanged) and are required to generate locational marginal prices (LMPs) based on the congestion of both the regions. IMEA calculates these amounts for the Congestion component of the Day-ahead market and the Real-time market as follows: the Congestion component in PJM locational marginal price (LMP) at the Prairie State node is subtracted from the Congestion component at LMP at the Naperville node. There are no similar congestion costs or credits for delivery of Trimble County from LG&E to PJM as LG&E is not part of a Regional Transmission Organization (RTO).

In sum: There is ***no material difference between IMEA transmission rates and PJM charges that Naperville would pay if it were not part of IMEA.*** The complexity of the PJM and COMED rate structure requires dedicated professionals that have many years of experience managing such efforts in this region. IMEA is one of the few long-term loads serving entities in COMED that can truly meet these standards.

If you have any questions or need any additional information, Please feel free to reach out to Rakesh Kothakapu (rkothakapu@imea.org)

| Annual Transmission Revenue Requirements (ATRR) and Network Integration Transmission Service (NITS) Rates | | | | |
|---|---|---|---|---|
| **Transmission Zone** | **Transmission Owner** | **Annual Revenue Requirement** | **Total Zonal Annual Revenue Requirement** | **Network Integration Transmission Service Rate ($/MW-Year)** |
| **AECO** | Atlantic City Electric Company | $ 239,334,801.00 | **$ 239,334,801.00** | **$ 91,559.00** |
| | | | | |
| **AEP** | AEP East Operating Companies | $ 1,287,054,780.00 | | |
| | AEP East Transmission Companies | $ 1,576,044,856.00 | | |
| | AMP Transmission, LLC | $ 750,621.28 | | |
| | | | **$ 2,863,850,257.28** | **$ 125,466.60** |
| | | | | |
| **APS** | South FirstEnergy Operating Companies | $ 159,299,229.00 | **$ 159,299,229.00** | **$ 17,114.75** |
| | | | | |
| **ATSI** | American Transmission Systems, Inc. | $ 1,031,766,861.00 | | |
| | AMP Transmission, LLC | $ 16,267,846.92 | | |
| | | | **$ 1,048,034,707.92** | **$ 87,624.38** |
| | | | | |
| **BGE** | Baltimore Gas and Electric Company | $ 302,526,020.00 | **$ 302,526,020.00** | **$ 46,400.00** |
| | | | | |
| **ComEd** | Commonwealth Edison Company | $ 846,151,471.00 | **$ 846,151,471.00** | **$ 39,796.00** |
| | | | | |
| **DAY** | The Dayton Power and Light Company | $ 105,611,813.00 | | |
| | AMP Transmission, LLC | $ 633,168.64 | | |
| | | | **$ 106,244,981.64** | **$ 32,781.54** |
| | | | | |
| **DEOK** | Duke Energy Ohio, Inc. and Duke Energy Kentucky, Inc. | $ 210,262,707.00 | **$ 210,262,707.00** | **$ 40,717.00** |
| | | | | |
| **DOM** | Virginia Electric and Power Company | $ 1,514,069,091.02 | **$ 1,514,069,091.02** | **$ 68,234.51** |
| | Virginia Electric and Power Company (Dominion Underground) | $ 11,961,322.48 | **$ 11,961,322.48** | **$ 569.43** |
| | | | | |
| **DPL** | Delmarva Power & Light Company | $ 222,366,549.00 | | |
| | Old Dominion Electric Cooperative | $ 5,211,354.00 | | |
| | | | **$ 227,577,903.00** | **$ 55,166.00** |
| | | | | |
| **DUQ** | Duquesne Light Company | $ 171,941,505.00 | **$ 171,941,505.00** | **$ 63,330.20** |
| | | | | |
| **EKPC** | East Kentucky Power Cooperative | $ 103,064,355.00 | **$ 103,064,355.00** | **$ 34,784.00** |
| | | | | |
| **JCPL** | Jersey Central Power and Light Company | $ 217,430,596.00 | **$ 217,430,596.00** | **$ 37,937.40** |
| | | | | |
| **ME** | Mid-Atlantic Interstate Transmission, LLC | $ 410,168,891.00 | **$ 410,168,891.00** | **$ 73,260.14** |
| **PENELEC** | | | | **$ 73,260.14** |
| | | | | |
| **OVEC** | Ohio Valley Electric Cooperative | $ 11,256,927.00 | **$ 11,256,927.00** | **$ 5,163.73** |
| | | | | |
| **PECO** | PECO Energy Company | $ 220,129,110.00 | **$ 220,129,110.00** | **$ 25,648.00** |
| | | | | |
| **PEPCO** | Potomac Electric Power Company | $ 231,867,579.00 | | |
| | Southern Maryland Electric Cooperative | $ 17,086,212.00 | | |
| | | | **$ 248,953,791.00** | **$ 42,655.88** |
| | | | | |
| **PPL** | PPL Electric Utilities Corporation | $ 724,534,909.00 | | |
| | Allegheny Electric Cooperative, Inc. | $ 2,584,702.00 | | |
| | UGI Utilities, Inc. | $ 11,023,445.00 | | |
| | | | **$ 738,143,056.00** | **$ 104,360.00** |
| | | | | |
| **PSEG** | Public Service Electric & Gas Company | $ 1,729,563,805.00 | **$ 1,729,563,805.00** | **$ 180,897.79** |
| | | | | |
| **RECO** | Rockland Electric Company* | $ 20,700,000.00 | **$ 20,700,000.00** | **$ 53,766.00** |
| | | | | |
| | NextEra Energy Transmission MidAtlantic Indiana | $ 1,807,858.00 | | |
| | Silver Run Electric, LLC | $ 25,793,147.00 | | |
| | Trans-Allegheny Insterstate Line Company | $ 278,570,075.79 | | |
| | Transource West Virginia, LLC | $ 9,367,951.00 | | |
| | | | | |
| | **TOTAL** | **$ 11,716,203,559.13** | **$ 11,400,664,527.34** | |

**As of 1/1/2024**

***Rockland Electric Company Stated Rate updated effective 1/1/2024 pursuant to FERC approved Settlement in Docket No. ER22-910***

# ATTACHMENT H-13

## Annual Transmission Rates -- Commonwealth Edison Company for Network Integration Transmission Service

1. The annual transmission revenue requirement and the gross rate for Network Integration Transmission Service are equal to the results of the formula shown in Attachment H-13A, posted on the PJM website, which reflects the transmission facilities of Commonwealth Edison Company ("ComEd") under the operational control of PJM. The rate determined pursuant to Attachment H-13A shall be implemented pursuant to the Formula Rate Implementation Protocols set forth in Attachment H-13B. Service utilizing other facilities will be provided at rates determined on a case-by-case basis.

2. On a monthly basis, revenue credits shall be calculated based on the sum of ComEd's share of revenues collected during the month from: (i) the PJM Border Rate under Schedule 7; (ii) Network Integration Transmission Service to Non-Zone Network Load under Attachment H-A; (iii) Seams Elimination Charge/Cost Adjustment/Assignment ("SECA") revenues allocable to ComEd under the Tariff; and (iv) any Point-To-Point Transmission Service where the Point of Receipt and the Point of Delivery are both internal to the ComEd Zone. On this basis, the sum of these revenues will appear as a reduction to the gross monthly rate stated above on a Network Customer's bill in that month for service under this attachment.

3. Within the ComEd Zone, a Network Customer's peak load shall include a transmission loss percentage of 1.6% applied to the measured load as well as any distribution losses as reflected in applicable state tariffs and/or service agreements that contain specific distribution loss factors for said Network Customer.

4. The rate and revenue requirement in paragraph 1 of this attachment shall be effective until amended by the Transmission Owner(s) within the Zone or modified by the Commission.

5. In addition to the rate set forth in paragraph 1 of this attachment, the Network Customer purchasing Network Integration Transmission Service shall pay for transmission congestion charges, in accordance with the provisions of the Tariff, and any amounts necessary to reimburse the Transmission Owners for any amounts payable by them as sales, exise, "Btu," carbon, value-added or similar taxes (other than taxes based upon or measured by net income) with respect to the amounts payable pursuant to the Tariff.

6. In addition to the other rates set forth in this schedule customers, within the ComEd zone shall be charged for recovery of RTO start-up costs at the following rates, each computed to four decimal places:

   Annual Rate - $/kW/year = $1,523,039, divided by the 1 CP demand for the ComEd zone for the prior calendar year;

   Monthly Rate - $/kW/month = Annual Rate divided by 12;

   Weekly Rate - $/kW/week = Annual Rate divided by 52;

Daily Rate - $/kW/day = Weekly Rate divided by 5.

In order to ensure that the charge does not result in either an over-recovery or under-recovery of ComEd's start-up costs, PJM will institute an annual true-up mechanism in the month of May of each of the years 2008-2014. In May of each of those years, PJM will compare the amount collected under this charge for the previous 12 months with the target annual amount of $1,523,039 and calculate any credits or surcharges that would be needed to ensure that $1,523,039 is collected for each year. Any credit or surcharge will be assessed in the June bills for years 2005-2014, consistent with the above methodology.

7. An annual Fixed Charge Rate of 24% shall apply to the net distribution plant that is directly assigned to a customer taking wholesale distribution service over ComEd distribution facilities. The net distribution plant will be directly assigned to the customer based on the customer's pro-rata share of the non-coincident peak loading of the distribution facilities necessary to provide the service. Generating units connected at the distribution level and requiring wholesale distribution service will not be assessed a charge based on application of the Fixed Charge Rate, but will be responsible for paying interconnection costs and other incremental costs determined for such customer.

8. In accordance with Paragraph 7 above, wholesale distribution service shall be provided to the customers identified below at the identified monthly/annual charge corresponding to such customer:

| **Customer** | **Charge** |
|---|---|
| Town of Winnetka | $164,080/year |
| Town of Rock Falls | $166,082/year |
| City of Naperville | $58,540.79/month |
| City of St. Charles | $181,479/month |
| McHenry Battery | $131,824.87/year |
| Marengo Battery | $ 7,367.24/month |
| Magid Glove & Safety Mfg. Co. | $ 3,921.02/month |
| Sterling Rail LLC | $ 2,620.91/month |

9. In accordance with Paragraph 3 above, the annual distribution loss factors identified below shall apply to wholesale distribution service provide to the identified customers:

| **Customer** | **Annual Distribution Loss Factor** |
|---|---|
| Town of Winnetka | 0.30% |
| Town of Rock Falls | 0.83% |
| The City of Geneva | 2.20% |
| City of Naperville | 0.09% |
| City of St. Charles | 1.94% |

10. In accordance with the settlement reached between ComEd and Geneva in Docket No. ER06-133, when Geneva operates its generating facility ("GGF") on a behind the meter ("BTM")

basis pursuant to Section 1.3B of this OATT, Geneva will pay ComEd an annual charge of $1,075,000 ($89,583.33 per month) for wholesale distribution service. There will be no additional charge associated with operation of the GGF on a BTM basis to serve the entirety of Geneva’s load. When Geneva does not operate the GGF BTM, Geneva will pay ComEd an annual charge for wholesale distribution service of $1,255,000 ($104,583.33 per month). In addition, Geneva will pay ComEd a one-time fee of $256,920.00 for a new point of interconnection to the Delnor substation on ComEd’s distribution system.

# Data Miner 2

## Load Reconciliation Billing Determinants - Monthly

Export:

Determinant Month Start Date * 3/1/2024 00:00 End Date * 3/1/2024 23:59 Submit Reset

| Determinant Month | Billing Determinant | Transmission Zone | Monthly Rate ($/MWh) |
|---|---|---|---|
| | | All | |
| 3/1/2024 00:00 | Schedule 9-1 ($/MWh) | PJM | 0.300864 |
| 3/1/2024 00:00 | Schedule 9-1 Refund ($/MWh) | PJM | 0 |
| 3/1/2024 00:00 | Schedule 9-3 ($/MWh) | PJM | 0.048842 |
| 3/1/2024 00:00 | Schedule 9-3 Refund ($/MWh) | PJM | 0 |
| 3/1/2024 00:00 | Schedule 9-FERC ($/MWh) | PJM | 0.1346 |
| 3/1/2024 00:00 | Schedule 9-OPSI ($/MWh) | PJM | 0.0012 |
| 3/1/2024 00:00 | Schedule 10-NERC ($/MWh) | PJM | 0.0204 |
| 3/1/2024 00:00 | Schedule 10-RFC ($/MWh) | PJM | 0.0295 |
| 3/1/2024 00:00 | Schedule 9-MMU ($/MWh) | PJM | 0.0071 |
| 3/1/2024 00:00 | Schedule 9-CAPS ($/MWh) | PJM | 0.0006 |
| 3/1/2024 00:00 | Schedule 9-PSI (9-1) ($/MWh) | PJM | 0.00189 |
| 3/1/2024 00:00 | Schedule 9-PSI (9-3) ($/MWh) | PJM | 0.000816 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | AECO | 0.0781 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | AEP | 0.0583 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | APS | 0.0595 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | ATSI | 0.0921 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | BGE | 0.043 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | COMED | 0.2223 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | DAY | 0.0218 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | DEOK | 0.1591 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | DPL | 0.0743 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | DUQ | 0.052 |
| 3/1/2024 00:00 | Schedule 1A ($/MWh) | EKPC | 0.3738 |

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