



Initial Review and Screening 2022 Multi-Driver Proposal Window No. 1

November 30, 2022

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2022 Multi-Driver Proposal Window No. 1

As part of its 2022 RTEP process cycle of studies, PJM identified reliability flowgates and market efficiency congestion drivers that were put forward for proposals as part of 2022 Multi-Driver Window No. 1. Specifically, discussed in this Initial Review and Screening report are those flowgates and congestion drivers listed in **Tables 1 and 2** below.

Table 1. 2022 Multi-Driver Proposal Window No. 1 - List of Reliability Flowgates

Flowgate #	Description	kV Level	Driver
MDW1-GD-W172, MDW1-GD-W171, MDW1-GD-W188, MDW1-GD-W190, MDW1-GD-W185, MDW1-GD-W309, MDW1-GD-W404, MDW1-GD-W419	Crete-St. John	345	Winter Generator Deliverability
MDW1-GD-W332, MDW1-GD-W331	E Frankfort-Crete	345	Winter Generator Deliverability
MDW1-GD-W392, MDW1-GD-W393	University Park N-Olive	345	Winter Generator Deliverability
MDW1-GD-S1620	Stillwell-Dumont	345	Summer Generator Deliverability

Table 2. 2022 Multi-Driver Proposal Window No. 1 - List of Congestion Drivers and Associated Flowgates

Flowgate #	Description	Voltage Level	Driver
MDW1-ME-01	Dumont to Stillwell	345	Congestion Relief - Economic
MDW1-ME-02	Olive to University Park North	345	Congestion Relief – Economic
MDW1-ME-03 MDW1-ME-04	E Frankfort to Crete to St. John	345	Congestion Relief – Economic

For the reliability flowgates, the following EOL and supplemental project information was included in the posted material. The following factors were considered during the evaluation and selection processes:

- Crete-St. John 345 kV: Exelon owned facilities are included in Exelon’s EOL candidate list, and NEET owned facilities are being rebuilt/reconducted through supplemental project s2631 to address EOL conditions.
- E Frankfort-Crete 345 kV: Exelon owned facilities are included in Exelon’s EOL candidate list.
- University Park N-Olive 345 kV: Exelon owned facilities are included in Exelon’s EOL candidate list. AEP owned facilities are included in AEP’s EOL candidate list. NEET owned facilities for this line are being rebuilt/reconducted through supplemental project s2509.

Proposals Submitted to PJM

PJM conducted 2022 Multi-Driver Proposal Window No. 1 for 60 days beginning June 7, 2022 to August 8, 2022. During the window, PJM received 14 proposals from three different entities through PJM's Competitive Planner Tool. The proposals are summarized in **Table 3**. Publicly available redacted versions of the proposals are available on PJM's web site: <https://www.pjm.com/planning/competitive-planning-process/redacted-proposals.aspx>.

In addition, and of relevance, on July 25, 2022 PJM received deactivation requests for Joliet thermal generation units 6, 7 and 8, amounting to 1,381 MW. PJM performed evaluation assessing the impact of the Joliet units retirements, and while there would be reliability FGs removed as a result of the retirements, PJM as per current rules, needs to preserve the CIRs for one year after the deactivation date. PJM reflected the Joliet retirements in its multi-driver evaluation, but conducted sensitivities to ensure due diligence in evaluating the reliability and congestion concerns in the area both with and without the Joliet unit contributions.

Proposal Costs

Unless otherwise specified, such as for the Market Efficiency analysis where in-service year cost estimates are used, PJM used current-year cost estimates as provided by the proposing entity in this report.

Table 3. 2022 Multi-Driver Proposal Window No. 1 - List of Received Proposals

Proposal ID#	Project Type	Project Description	Total Construction Cost (\$M)	Cost Capping Provisions (Y/N)
40	Greenfield	Swap 345kV transmission line at Green Acres, rebuild University Park to Olive 345kV lines and add a reactor along Crete- St John 345kV line.	\$83.4	N
82	Greenfield	Add a new 345 kV double circuit to tap existing lines and connect to an existing sub, and reconfigure existing lines at the sub	\$61.5	N
91	Greenfield	Goodenow-Lemon Lake 345kV Greenfield Line and Stations (Enhanced)	\$101.8	Y
165	Upgrade	Dumont-Stillwell Sag Study	\$0.2	N
401	Greenfield	Add a new 345kV double circuit to reconfigure existing lines	\$51.2	N
541	Greenfield	Peregrine Ditch	\$14.8	Y
597	Greenfield	Goodenow-Lemon Lake 345kV Greenfield Line and Stations (Robust)	\$127.1	Y
612	Greenfield	Goodenow-Lemon Lake 345kV Greenfield Line and Stations (Basic)	\$98.1	Y
644	Upgrade	Swap 345kV transmission line at Green Acres, rebuild University Park to Olive 345kV lines	\$98.8	N
664	Greenfield	Add a new 345 kV double circuit line looping the existing line into a new substation	\$74.0	N
908	Upgrade	Olive-University Park Sag Study	\$1.5	N
253	Upgrade	Rebuild 345 kV Lines 6607/6608 East Frankfort - Crete and 94507/97008 Crete - St. John	\$62.6	N
977	Upgrade	Rebuild 345 kV double circuit Lines 94507 and 97008 Crete - Indiana	\$17.1	N
994	Upgrade	Install Series Inductor on Line 94507 Crete - St. John	\$12.0	N

Initial Review and Screening: Reliability

PJM has completed an initial review and screening of the proposals listed in **Table 3** based on data and information provided by the project sponsors as part of their submitted proposals. This review and screening included the following analytical quality assessments:

- *Initial Performance Review* – PJM evaluated whether or not the project proposal solved the required reliability criteria violation drivers posted as part of the open solicitation process.
- *Initial Planning Level Cost Review* – PJM reviewed the estimated current-year project cost submitted by the project sponsor and any relevant cost containment mechanisms submitted as well. PJM conducted an independent review of the project components and costs, and made adjustments where more accurate scope and costs were known from the incumbent TO, or based on assumptions documented in the proposal which were also confirmed with proposing entity. The independently derived costs are summarized in Table 4.
- *Initial Feasibility Review* – PJM reviewed the overall proposed implementation plan to determine if the project, as proposed, can feasibly be constructed.
- *Additional Benefits Review* – PJM reviewed information provided by the proposing entity to determine if the project, as proposed, provides additional benefits such as the elimination of other needs on the system.

Initial performance reviews yielded the following results:

1. All 14 proposals solve the intended reliability criteria violations. Not all proposals are intended to resolve all of the posted flowgates.
2. One of the proposals (proposal #977) creates a new reliability issue

A high-level review of the plans identified in the proposals summarized in **Table 3** does not reveal any concerns at this stage of review.

Table 4. Reliability Proposal Cost Adjustments

Proposal ID#	Type	Proposing Entity	Independent Cost (\$M)	Reason for Cost Adjustment
165	Upgrade	AEP	\$0.22	No cost adjustments made.
908	Upgrade	AEP	\$1.50	No cost adjustments made.
91	Greenfield	AEP	\$130.61	Inclusion of proposals #977, #165 and s2631 as documented in proposal assumptions.
541	Greenfield	AEP	\$89.19	Inclusion of proposals #253, #165 and s2631 as documented in proposal assumptions.
597	Greenfield	AEP	\$155.97	Inclusion of proposals #977, #165 and s2631 as documented in proposal assumptions.
612	Greenfield	AEP	\$126.97	Inclusion of proposals #977, #165 and s2631 as documented in proposal assumptions.
253	Upgrade	ComEd	\$64.67	Inclusion of NEET proposal #644.3 (Reconductor Crete - St. John-NEETMA 345 kV TL upgrade)
977	Upgrade	ComEd	\$19.12	Inclusion of NEET proposal #644.3 (Reconductor Crete - St. John-NEETMA 345 kV TL upgrade)
994	Upgrade	ComEd	\$12.01	No cost adjustments made.
644	Upgrade	NEET	\$72.37	Replacement of NEET's reconductor scope/cost of ComEd facilities (644.4-7) with ComEd's proposal 253 rebuild. Cost adjustment for proposal #644.8 component with estimate from incumbent TO. Removal of 644.2 component cost that will remain a supplemental project.
40	Greenfield	NEET	\$62.13	Replacement of NEET's reconductor scope/cost of ComEd facilities with ComEd's proposal #253 rebuild (using per mile estimate). Removal of 40.2 component cost that will remain a supplemental project.
82	Greenfield	NEET	\$68.93	Replacement of NEET's reconductor scope/cost of ComEd facilities with ComEd's proposal #977 rebuild. Cost adjustment for 82.9 component with estimate from incumbent TO.
401	Greenfield	NEET	\$48.44	Cost adjustment for proposal #401.4 component with estimate from incumbent TO.
664	Greenfield	NEET	\$90.81	Replacement of NEET's reconductor scope/cost of ComEd facilities with ComEd's proposal #253 rebuild (using per mile estimate). Cost adjustment for proposal #664.7 component with estimate from incumbent TO. Removal of proposal #664.3 component cost that will remain a supplemental project.

Additional Benefits: Reliability

In addition to addressing the identified reliability need, PJM also considered the additional benefits a proposal may provide. As discussed in Section 1.1 and Section 1.4.2 of PJM manual 14B, Transmission Owner Attachment M-3 needs and projects must be reviewed to determine any overlap with solutions proposed to solve the violations identified as part of opening an RTEP proposal window.

A review of these overlaps as part of PJM's 2022 Multi-Driver Proposal Window No. 1 screening has identified potential benefits beyond solving identified reliability criteria violations. Based on the information provided by the sponsor(s), proposal #s 91, 541, 597, 612, 253, 977, 644, 40, 82 and 664 will address needs associated with aging infrastructure following a review of the information provided by the sponsor of the proposal. These needs are outlined below in regards to the multiple line sections as indicated in the three groups below.

- Proposal #91 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles) and NEET's section of Crete-St. John 345 kV line (6.95 miles).
- Proposal #541 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles), NEET's section of Crete-St. John 345 kV line (6.95 miles) and ComEd's 345 kV double circuit extending from Crete to East Frankfort (12.7 miles).
- Proposal #597 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles) and NEET's section of Crete-St. John 345 kV line (6.95 miles).
- Proposal #612 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles) and NEET's section of Crete-St. John 345 kV line (6.95 miles).
- Proposal #253 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles), NEET's section of Crete-St. John 345 kV line (6.95 miles) and ComEd's 345 kV double circuit extending from Crete to East Frankfort (12.7 miles).
- Proposal #977 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles) and NEET's section of Crete-St. John 345 kV line (6.95 miles).
- Proposal #644 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles), NEET's section of Crete-St. John 345 kV line (6.95 miles) and ComEd's 345 kV double circuit extending from Crete to East Frankfort (12.7 miles).
- Proposal #40 – Addresses aging infrastructure on a portion of ComEd's 345 kV double circuit extending from St. John to East Frankfort (12.21 miles), and NEET's section of Crete-St. John 345 kV line (6.95 miles).
- Proposal #82 – Addresses aging infrastructure on ComEd's section of Crete-St. John 345 kV double circuit (5 miles) and NEET's section of Crete-St. John 345 kV line (6.95 miles).
- Proposal #664 – Addresses aging infrastructure on a portion of ComEd's 345 kV double circuit extending from St. John to East Frankfort (12.21 miles), and NEET's section of Crete-St. John 345 kV line (6.95 miles).

Based on reliability performance, independent costs and additional benefits, **Table 5** summarizes PJM's top 3 proposal candidates:

Table 5. 2022 RTEP Multi-Driver Window 1 - Top 3 Reliability Proposals

Proposal ID#	Type	Proposing Entity	Independent Cost (\$M)	Additional Benefits
253	Upgrade	ComEd	\$64.67	Addresses all of Exelon's EOL facilities in the area, along with NEET EOL facilities not already addressed by s2509 (which will remain a supplemental project).
644	Upgrade	NEET	\$72.37	
541	Greenfield	AEP	\$89.19	

Initial Review and Screening: Market Efficiency

PJM completed an initial review and screening of the market efficiency aspects of the proposals listed in Table 3, except Proposal #977. Project #977 created an additional reliability issue and was not individually reviewed for market efficiency. The initial review and screening included the following analytical quality assessment:

- *Initial Performance Review* – PJM evaluated the degree by which the project proposal addressed the market efficiency congestion drivers posted as part of the open solicitation process as well as whether the congestion was shifted or new congestion was created.
- *Initial Planning Level Cost Review* – PJM reviewed the estimated in-service year project cost submitted by the project sponsor and any relevant cost containment mechanisms submitted as well. PJM conducted an independent review of the project components and costs, and made adjustments where more accurate scope and costs were known from the incumbent TO, or based on assumptions documented in the proposal which were also confirmed with proposing entity. The independent in-service year project costs are provided in **Table 7**.

The initial market efficiency performance review yielded the following results for the proposals received in the 2022 Multi-Driver Proposal Window No. 1:

- Proposal #40 – Addresses a significant portion of the area congestion, however it leaves some congestion on the E.Frankfort-University Park line.
- Proposal #82 – Addresses a significant portion of the area congestion, however it leaves significant congestion on the new Olive-St John line.
- Proposal #91 – This proposal, as submitted, doesn't address congestion on the Dumont-Stillwell line which prevents the full congestion benefits of this proposal to be realized.
- Proposal #165 – This sag study proposal only addresses the Dumont-Stillwell congestion, leaving the rest of area congestion unsolved.
- Proposal #253 – This proposal, as submitted, doesn't address congestion on the Dumont-Stillwell and Olive-University Park lines which prevents the full congestion benefits of this proposal to be realized.
- Proposal #401 – Addresses a large portion of the area congestion, however it leaves significant congestion on the Olive-University Park line. It also shifts congestion to St. John-Green Acre line.

- Proposal #541 – This proposal, as submitted, doesn't address congestion on the Dumont-Stillwell line which prevents the full congestion benefits of this proposal to be realized.
- Proposal #597 – This proposal, as submitted, doesn't address congestion on the Dumont-Stillwell line which prevents the full congestion benefits of this proposal to be realized.
- Proposal #612– This proposal, as submitted, doesn't address congestion on the Dumont-Stillwell line which prevents the full congestion benefits of this proposal to be realized.
- Proposal #644 – Addresses a significant portion of the area congestion, however it shifts some congestion to the new Olive-St John line.
- Proposal #664 – Addresses a large portion of the area congestion, however it leaves significant congestion on the new Olive – Stateline line.
- Proposal #908 – This sag study proposal only addresses the Dumont-Stillwell congestion, leaving the rest of area congestion unsolved.
- Proposal #994 – Does not address area congestion. It leaves significant congestion on the Dumont-Stillwell line and increases congestion on the Olive-University Park line.

Overall, none of the projects individually addressed the posted market efficiency congestion drivers. **Table 6** provides a summary of the market efficiency initial performance review.

Table 6. 2022 Multi-Driver Window 1 - Summary of Market Efficiency Initial Performance Review

Proposal ID#	Project Type	Project Description	2027 Unsolved Congestion* (\$M)	2027 Congestion Solved* (%)	Comments
40	Upgrade	Swap 345kV transmission line at Green Acres, rebuild University Park to Olive 345kV lines and add a reactor along Crete- St John 345kV line.	\$2.71	85%	Proposal leaves some congestion on E. Frankfort-Univ. Park.
82	Greenfield	Add a new 345 kV double circuit to tap existing lines and connect to an existing sub, and reconfigure existing lines at the sub	\$6.51	63%	Proposal leaves significant congestion on new line Olive-St John.
91	Greenfield	Goodenow-Lemon Lake 345kV Greenfield Line and Stations (Enhanced)	\$14.51	15%	Proposal leaves significant congestion on Dumont-Stillwell.
165	Upgrade	Dumont-Stillwell Sag Study	\$13.07	24%	Proposal addresses Dumont-Stillwell congestion only.
253	Upgrade	Rebuild 345 kV Lines 6607/6608 East Frankfort - Crete and 94507/97008 Crete - St. John	\$16.70	2%	Proposal leaves significant congestion on Dumont-Stillwell and Olive-University Park.
401	Greenfield	Add a new 345kV double circuit to reconfigure existing lines	\$8.43	51%	Proposal leaves significant congestion on Olive-University Park and shifts congestion to St John-Green Acre NIPSCO line.
541	Greenfield	Peregrine Ditch	\$17.16	0%	Proposal leaves significant congestion on Dumont-Stillwell.
597	Greenfield	Goodenow-Lemon Lake 345kV Greenfield Line and Stations (Robust)	\$14.60	15%	Proposal leaves significant congestion on Dumont-Stillwell
612	Greenfield	Goodenow-Lemon Lake 345kV Greenfield Line and Stations (Basic)	\$14.61	15%	Proposal leaves significant congestion on Dumont-Stillwell
644	Upgrade	Swap 345kV transmission line at Green Acres, rebuild University Park to Olive 345kV lines	\$2.42	87%	Proposal shifts some congestion to new line Olive-St John
664	Greenfield	Add a new 345 kV double circuit line looping the existing line into a new substation	\$8.04	54%	Proposal leaves significant congestion on new line Olive-Stateline.
908	Upgrade	Olive-University Park Sag Study	\$15.95	7%	Proposal addresses Dumont-Stillwell congestion only.
994	Upgrade	Install Series Inductor on Line 94507 Crete - St. John	\$18.37	0%	Proposal leaves significant congestion on Dumont-Stillwell. Increases flows and congestion on Olive-University Park

*Note: Congestion in the COMED-NIPSCO-AEP area (simulated year 2027).

PJM calculates a benefit-to-cost threshold ratio to determine if there is market efficiency justification for a particular transmission enhancement. The benefit-to-cost ratio is calculated by comparing the net present value of annual energy market benefits for a 15-year period starting with the RTEP year compared to the net present value of the project's revenue requirement for the same 15-year period. The energy benefit calculation for lower voltage facilities is weighted 100 percent to zones with a decrease in net load payments as a result of the proposed project. The change in net load energy payment is the change in gross load payment offset by the change in transmission rights credits. The net load payment benefit is only calculated for zones in which the proposed project decreases the net load payments. Zones for which the net load payments increase because of the proposed project, are excluded from the net load energy payment benefit.

Additional detail concerning the metrics and methods used to determine economic benefit are described in:

- PJM Manual 14B, [Section 2.6](#)
- PJM Operating Agreement, Schedule 6, [Section 1.5.7](#)

PJM analyzed the independent cost and congestion characteristics of the individual projects. When high potential projects were combined with specific sag study projects that address remaining congestion, a number of combination projects were able to address the market efficiency congestion drivers and maintain a B/C ratio greater than 1.25. Table 7 provides a summary of the five top performing market efficiency combination projects.

Table 7. 2022 RTEP Multi Driver Window 1 - Top 5 Market Efficiency Combination Projects

Proposal ID#	Project Description	Independent Total In-Service Year Construction Cost** (\$M)	15-year net load payment benefit (\$M)	B/C Ratio	Percent Congestion* Alleviated
82 + 908	Add a new 345 kV double circuit to tap existing lines and connect to an existing sub, and reconfigure existing lines at the sub. Olive-University Park Sag Study.	\$75.32	\$155.59	1.99	92%
644 + 908	Swap 345kV transmission line at Green Acres, rebuild University Park to Olive 345kV lines. Olive-University Park Sag Study.	\$82.30	\$167.15	1.96	91%
40	Swap 345kV transmission line at Green Acres, rebuild University Park to Olive 345kV lines and add a reactor along Crete-St John 345kV line.	\$65.02	\$120.03	1.78	85%
541+908	Construct a greenfield 4-breaker ring station (Peregrine Ditch 345 kV) in Union Township, IN. Tap Olive-Green Acres 345 kV and Olive-University Park 345 kV at Tower #275 into the new station. Olive-University Park Sag Study. Dumont-Stillwell Sag Study.	\$94.72	\$163.96	1.67	87%
664+908	Add a new 345 kV double circuit line looping the existing line into a new substation. Olive-University Park Sag Study.	\$96.38	\$137.69	1.38	90%

*Note: Congestion in the COMED-NIPSCO-AEP area (simulated year 2027).

**The in-service year independent cost is reflected in this table as it is used to calculate the B/C ratio.

Initial Review Conclusions and Next Steps: Reliability & Market Efficiency

As shown in **Table 5**, the top proposal candidate from a reliability perspective was proposal #253, however as a standalone project, it does not resolve the market efficiency congestion drivers. As shown in Table 7, one of the top proposal candidate from a market efficiency perspective was proposal #82 combined with proposal #908. However, proposal #82 is not preferred for the following reasons:

1. Addresses only a portion of EOL facilities in the area, as Exelon has an additional 12.7 miles of double circuit extending from Crete to East Frankfort 345 kV. Rebuilding this line and with associated equipment has an estimated cost of \$45.55 million, which will result in greater overall future transmission costs as it proceeds through the M-3 process.
2. Includes a Greenfield component, which includes the construction of an approximately 12 mile 345 kV double circuit line from the existing Bloom-Davis Creek 345 kV line to the St. John substation (over 8 miles of which would require new ROW).

Accordingly, the following proposal combination, as summarized in **Table 8**, appears to be the more efficient or cost effective solution for the 2022 RTEP Multi-Driver Window 1. The proposal combination addresses the reliability violations while providing additional benefits from an EOL facility consideration and utilization perspectives, and resolves 91% of congestion in the area (simulated year 2027):

- Proposal #644, with replacement of NEET's reconductor scope/cost of ComEd facilities (proposal #644.4-7) with ComEd's proposal #253 rebuild, and removal of proposal #644.2 component cost (which will remain a supplemental project), combined with proposal #908.

PJM's initial planning level cost review and initial feasibility review suggests that further constructability review and financial analysis would not materially contribute to the analysis of the other proposals submitted for this cluster

Table 8. 2022 RTEP Multi-Driver Window 1 - Summary of Selected Proposal Components

Proposal ID#	Component Description	Proposed Total Construction Cost (\$M)	Independent Total Construction Cost (\$M)
644	1. Green Acres Substation transmission lines swap upgrades	\$1.98	\$1.98
	2. Rebuild Uni (IN/IL border)-Green Acres 345 kV TL	\$40.00	Remaining supplemental project
	3. Reconductor Crete - St. John-NEETMA 345 kV TL upgrade	\$1.99	\$1.99
	4. Crete - St. John-ComEd 345 kV TL upgrade	\$6.45	Replaced with proposal #253 components
	5. E Frankfort - Crete -ComEd 345 kV TL upgrade	\$16.48	
	6. E Frankfort - Uni North 345kV TL Upgrade	\$7.03	
	7. Uni North - Uni-Olive IN/IL section 345kV TL Upgrade	\$15.83	
	8. Stillwell - Dumont 345 kV TL substation limiting element rating upgrade	\$5.00	\$2.22*
	9. St. Johns substation terminal equipment upgrade	\$2.00	\$2.00
	10. Green Acres substation terminal equipment upgrade	\$2.00	\$2.00
253	1. Rebuild 5 miles of 345 kV double circuit in Illinois with twin bundled 1277 ACAR conductor (94507 & 97008)	\$16.64	\$16.64
	3. Rebuild 12.7 miles of 345 kV double circuit with twin bundled 1277 ACAR conductor (6607 & 6608 & 97008)	\$42.28	\$42.28
	4. Replace East Frankfort 345 kV CB 9-14 (existing breaker is a 44 year old oil type circuit breaker, replace with a 3150A 63kA SF6 CB)	\$3.27	\$3.27
908	Olive-University Park Sag Study	\$1.5	\$1.5
Total			\$73.88

* Cost adjustment for proposal #644.8 component with estimate from incumbent TO.