

AEP/Duke/Exelon Proposal on Multi-Driver Projects

PJM RPPTF Meeting

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Definition

1. Multi-Driver Projects are **Primarily** Reliability Projects that Also Address Other Types of Transmission Planning Criteria Violations and Transmission Needs that are Identified by PJM (e.g., Reliability and Market Efficiency), and are Approved by PJM on That Basis, which Differentiates them from Single-Driver Projects (e.g., Reliability Only)

Five Examples That Illustrate “How” Multi-Driver Projects Can Be Incorporated Into RTEP

Five Examples

1. Example 1: Reliability, Market Efficiency, Interconnection, and Public Policy Needs
2. Example 2: Reliability and Market Efficiency Needs (Different Costs)
3. Example 3: Reliability and Market Efficiency Needs (Same Costs)
4. Example 4: Reliability and Public Policy (State Agreement) Needs (Different Costs)
5. Example 5: Reliability and Public Policy (State Agreement) Needs (Same Costs)

Example 1

Reliability, Market Efficiency, Interconnection, and Public Policy Needs

Expectation

1. Multi-Driver Projects Will Happen by Default Through Effort by PJM to Evaluate and Select the Most Efficient and Cost-Effective Projects that Resolve Transmission Planning Criteria Violations and Address Transmission Needs that are Identified by PJM

Four Steps to Multi-Driver Projects

1. Step 1: PJM **Identifies** Transmission Planning Criteria Violations and Transmission Needs
2. Step 2: Developers **Propose** Projects to Resolve Criteria Violations & Address Needs
3. Step 3: PJM **Evaluates** Proposed Projects to Resolve Criteria Violations & Address Needs
4. Step 4: PJM **Selects** Most Efficient and Cost-Effective Projects to Resolve Planning Criteria Violations and Address Transmission Needs

--- Step 1 ---
PJM Identifies
Transmission Planning Criteria
Violations and Needs

Step 1: PJM Identifies Violations

1. Prior to Opening of Four-Month Window for Proposals, PJM Identifies Planning Criteria Violations for Applicable RTEP Drivers:
 - a) Reliability (Baseline & Scenario)
 - b) Market Efficiency (Baseline & Scenario)
 - c) Operational Performance
 - d) Interconnection Requests (Queue) (Network Upgrades)
 - e) Public Policy (Renewable Portfolio Standards, Other)
 - f) Aging Infrastructure (Criteria Under Development)
 - g) Other Drivers (ARR Insufficiency, etc.)

Step 1: PJM Identifies Needs

2. For Interconnection Requests Driver, PJM also Identifies Following Transmission Needs:

- a) Actual Interconnection Upgrades from Previous Three Closed Queues and Present Open Queue that Could be Replaced by More Efficient and Cost-Effective Upgrades
 - ✓ **NEED TO DEVELOP OBJECTIVE BASIS FOR PJM TO IDENTIFY NETWORK UPGRADES THAT WOULD BE SUBJECT TO BEING REVISITED IN MULTI-DRIVER ANALYSIS (E.G., UPGRADES GREATER THAN \$10M)**
- b) Expected Interconnection Upgrades from Future Queues
 - ✓ **COULD ALSO INCLUDE ESTIMATED FUTURE NEEDS (E.G., PERCENT OF PROJECT RESERVED FOR FUTURE “BUT-FOR” INTERCONNECTION NEEDS)**

Step 1: PJM Identifies Needs

3. For Public Policy Driver, PJM also Identifies Following Transmission Needs:
 - a) Public Policy Needs Covered by State Agreements
 - b) Public Policy Needs NOT Covered by State Agreements
 - ✓ **COULD ALSO INCLUDE SUCH NEEDS BASED ON LEVELS IDENTIFIED BY STAKEHOLDERS**

--- Step 2 ---

Developers **Propose** Projects
to Resolve Planning Criteria
Violations and Address Needs

Step 2: Developers **Propose** Projects

1. Developers **Propose** Projects and Specify which Planning Criteria Violations they Resolve and Transmission Needs they Address
 - a) Project A Resolves Reliability Violations 1-5 (\$100M)
 - b) Project B Resolves Reliability Violations 6-9 (\$25M)
 - c) Project C Resolves Market Efficiency Violations (\$50M)
 - d) Project D Replaces Interconnection Upgrades (\$25M)
 - e) Project E Addresses Public Policy Needs (\$50M)
 - f) Project F Resolves Reliability Violations 1-8, Market Efficiency Violations, Interconnection Upgrades, and Public Policy Needs (\$190M)

--- Step 3 ---

PJM Evaluates Proposed Projects
to Resolve Planning Criteria
Violations and Address Needs

Step 3: PJM Evaluates Projects

1. PJM Evaluates Proposed Projects to Determine which Planning Criteria Violations they Resolve and Needs they Address; e.g., PJM Confirms:
 - a) Project A Resolves Reliability Violations 1-5 (\$100M)
 - b) Project B Resolves Reliability Violations 6-9 (\$25M)
 - c) Project C Resolves Market Efficiency Violations (\$50M)
 - d) Project D Replaces Interconnection Upgrades (\$25M)
 - e) Project E Addresses Public Policy Needs (\$50M)
 - f) Project F Resolves Reliability Violations 1-8, Market Efficiency Violations, Interconnection Upgrades, and Public Policy Needs (\$190M)

Step 3: PJM Evaluates Projects

1. (Continued)

- g) In Process of Evaluating Project F, PJM Determines that Project G is Needed to Resolve Reliability Violation 9 (\$10M)
- h) In Addition, PJM Does Not Identify any More Efficient and Cost-Effective Single-Driver Alternatives to Projects A thru E, Therefore, Multi-Driver Alternative Project F (Along With Project G) Can Be Evaluated Head-To-Head Against Those Single-Driver Alternatives (A thru E)
- i) Should Note that Interconnection Portion of Multi-Driver Project F or Single-Driver Project D will be Allocated to Interconnection Customers on “But-For” Basis

--- Step 4 ---

**PJM Selects Most Efficient and
Cost-Effective Projects that
Resolve Planning Criteria
Violations and Address Needs**

Step 4: PJM Selects Projects

1. PJM Selects Most Efficient and Cost-Effective Projects that Resolve Transmission Planning Criteria Violations and Address Transmission Needs; e.g., PJM Selects:
 - a) Project F Resolves Reliability Violations 1-8, Market Efficiency Violations, Interconnection Upgrades, and Public Policy Needs (\$190M)
 - b) Project G Resolves Reliability Violation 9 (\$10M)

Step 4: PJM Selects Projects

2. PJM Allocates M-D Project Benefits to Drivers Based on Costs of Replaced S-D Projects

	<u>Single-D</u>	<u>Multi-D</u>	<u>Allocated</u>
✓ Reliability (A)	(\$100M)		(\$80M)
✓ Reliability (B)	(\$25M)		(\$20M)
✓ Market Efficiency (C)	(\$50M)		(\$40M)
✓ Interconnection (D)	(\$25M)		(\$20M)
✓ Public Policy (E)	(\$50M)		(\$40M)
✓ Selected Project F		(\$190M)	
✓ Selected Project G		(\$10M)	
TOTALS	(\$250M)	(\$200M)	(\$200M)

Example 2

Reliability and Market Efficiency Needs (Different Costs)

Example 2

1. Two Projects Addressing Same Reliability But Different Market Efficiency at **Different** Costs

a) Project X:

- 1) Cost of **\$140M** (PV)
- 2) Addresses Reliability Violations 1-9
- 3) Provides \$75M (PV) Worth of Market Efficiency Benefit
- 4) No Single-Driver Project Relieves that \$75M of Congestion

b) Project Y:

- 1) Cost of **\$180M** (PV)
- 2) Addresses Reliability Violations 1-9
- 3) Provides \$200M (PV) Worth of Market Efficiency Benefit
- 4) No Single-Driver Project Relieves that \$200M of Congestion

Example 2

2. PJM Selects Project Y Over Project X Only IF:

- a) Ratio of Incremental Market Efficiency Benefit (Y-X) to Incremental Cost (Y-X) > 1.25
- b) Ratio = $(\$200M - \$75M) / (\$180M - \$140M)$
 $= \$125M / \$40M = 3.125$

3. Conclusion: PJM Selects Project Y

- a) PJM Allocates \$180M Cost of Multi-Driver Project to RTEP Drivers Based on Relative Benefits as Follows:
 - ✓ \$140M to Reliability Driver, and
 - ✓ \$40M to Market Efficiency Driver (Based on Incremental Benefit/Cost Ratio Analysis)

Example 3

Reliability and Market Efficiency Needs (Same Costs)

Example 3

1. Two Projects Addressing Same Reliability But Different Market Efficiency at **Same** Costs

a) Project X:

- 1) Cost of **\$150M** (PV)
- 2) Addresses Reliability Violations 1-9
- 3) Provides \$75M (PV) Worth of Market Efficiency Benefit
- 4) No Single-Driver Project Relieves that \$75M of Congestion

b) Project Y:

- 1) Cost of **\$150M** (PV)
- 2) Addresses Reliability Violations 1-9
- 3) Provides \$200M (PV) Worth of Market Efficiency Benefit
- 4) No Single-Driver Project Relieves that \$200M of Congestion

Example 3

2. PJM Selects Project Y Over Project X, Since Relief of Additional \$125M of Congestion by Project Y Serves as Tiebreaker
 - a) PJM Allocates \$150M Cost of Multi-Driver Project to RTEP Drivers Based on Relative Benefits as Follows:
 - ✓ \$150M to Reliability Driver, and
 - ✓ None to Market Efficiency Driver (Since Side Benefit)

Example 4

Reliability and Public Policy (State Agreement) Needs (Different Costs)

Example 4

1. Two Projects Addressing Same Reliability But Different Public Policy at **Different** Costs

a) Project X:

- 1) Cost of **\$150M**
- 2) Addresses Reliability Violations 1-9
- 3) Does NOT Address Public Policy Specified in State Agreement
- 4) Single-Driver Project Addresses Public Policy for \$100M

b) Project Y:

- 1) Cost of **\$200M**
- 2) Addresses Reliability Violations 1-9
- 3) Does Address Public Policy Specified in State Agreement
- 4) Single-Driver Project Addresses Public Policy for \$100M

Example 4

2. PJM Selects Project Y Over Project X and Single-Driver Public Policy Project, Since:
 - a) Project Y Displaces \$100M Single-Driver Project at Incremental Cost of \$50M Over Project X
 - b) PJM Allocates \$200M Cost of Multi-Driver Project to RTEP Drivers Based on Relative Benefits as Follows:
 - ✓ \$120M to Reliability Driver, and
(\$200M x \$150M/\$250M)
 - ✓ \$80M to Public Policy (State Agreement) Driver
(\$200M x \$100M/\$250M)

Example 5

Reliability and Public Policy (State Agreement) Needs (Same Costs)

Example 5

1. Two Projects Addressing Same Reliability But Different Public Policy at **Same** Costs

a) Project X:

- 1) Cost of **\$175M**
- 2) Addresses Reliability Violations 1-9
- 3) Does NOT Address Public Policy Specified in State Agreement
- 4) Single-Driver Project Addresses Public Policy for \$50M

b) Project Y:

- 1) Cost of **\$175M**
- 2) Addresses Reliability Violations 1-9
- 3) Does Address Public Policy Specified in State Agreement
- 4) Single-Driver Project Addresses Public Policy for \$50M

Example 5

2. PJM Selects Project Y Over Project X and Single-Driver Public Policy Project, Since:
 - a) Project Y Displaces \$50M Single-Driver Project at No Incremental Cost Over Project X
 - b) PJM Allocates \$175M Cost of Multi-Driver Project to RTEP Drivers Based on Relative Benefits as Follows:
 - ✓ \$136M to Reliability Driver, and
($\$175\text{M} \times \$175\text{M}/\$225\text{M}$)
 - ✓ \$39M to Public Policy (State Agreement) Driver
($\$175\text{M} \times \$50\text{M}/\$225\text{M}$)

Conclusion

Conclusion

1. Multi-Driver Projects Will Happen by Default Through Effort by PJM to Evaluate and Select the Most Efficient and Cost-Effective Projects that Resolve Transmission Planning Criteria Violations and Address Transmission Needs that are Identified by PJM

Questions ???