



Market Efficiency Update

Transmission Expansion Advisory Committee
September 12, 2019
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2018/19 Market Efficiency Window

- **Bosserman – Trail Creek 138 kV**
 - Results presented at August 2019 TEAC ([slide 6](#))
 - Two lower cost proposals, BT_481 and BT_129, substantially relieve congestion on the driver without shifting congestion
 - RPM benefit analysis found there are no RPM benefits for either BT_481 or BT_129 proposals
 - PJM 15-year load payment benefits for each interregional proposal are shown in Appendix A
- **Marblehead Transformer**
 - PJM 15-year load payment benefits for each proposal are shown in Appendix A
- **Monroe – Wayne 345 kV**
 - None of the proposals significantly decrease the total congestion around the Monroe bus
 - Analysis presented at June 2019 TEAC ([slide 11](#))

- Preliminary results presented at [July 2019 TEAC](#)
 - Calculated preliminary benefits and determined preliminary B/C ratios
- Three lower cost proposals fully relieve congestion on the driver with minimal shift in congestion
 - HL_469: Install SmartWire** power flow control series device
 - HL_622: Rebuild the Hunterstown-Lincoln 115 kV line
 - HL_960: Build new Hunterstown-Lincoln 115 kV line
- Proposals currently under Cost/Constructability Analysis

- Complete Cost/Constructability Analysis for all proposals
- Interregional Proposals
 - Coordination with MISO on interregional proposal B/C ratios
 - PJM/MISO Cost Split expected to be presented at PJM-MISO IPSAC meeting on September 20th, 2019
- Hunterstown – Lincoln Proposals
 - Focus on more cost effective candidates that fully address congestion (see Appendix B for top 5 proposals ranked by B/C ratio)

Note: PJM is currently monitoring on-going developments relating to the Hunterstown-Lincoln congestion driver. The outcome of these developments may impact the market efficiency analysis for this driver. Further updates will be provided as they become available.



2019 Annual Reevaluation of Market Efficiency Projects

- On June 28, 2019, PJM filed revisions to the Operating Agreement (OA), Schedule 6, section 1.5.7(f)
 - Pursuant to section 205 of the Federal Power Act (FPA),
 - To add clarity by specifying a time after which PJM is no longer required to conduct an annual re-evaluation of previously approved market efficiency projects.
- On August 22, 2019 FERC accepted PJM’s proposed OA revisions
 - Effective August 28, 2019
- See Appendix C for PJM Proposal “A” on Reevaluation Criteria, accepted by FERC

- Applies to market efficiency projects approved during the 2014/15 and 2016/17 RTEP Windows
- Projects already in-service, under construction or with a near in-service date will not be reevaluated
- Projects must meet the B/C criterion of 1.25
- Reevaluation Process to be completed by December 2019



2019 Acceleration Analysis

- Scope
 - Determine which Reliability upgrades, if any, have an economic benefit if accelerated or modified
- Study Years
 - 2020 and 2024 set of economic input assumptions used to study impacts of approved RTEP projects
- Process
 - Compare market congestion for near term vs. future topology
 - Estimate economic impact of accelerating planned reliability upgrades

- Currently finalizing PROMOD modeling work for 2020 and 2024 (AS-IS topology) cases
- Next step: Complete PROMOD simulations
 - 2020 and 2024 study years with 2019 Topology (AS-IS Topology)
 - 2020 and 2024 study years with 2023 Topology (RTEP Topology)
- Compare the board approved reliability upgrades with the congestion reductions between the AS-IS and the RTEP Base cases

Appendix A - Interregional Proposals Results



Bosserman-Trail Creek Proposals Preliminary Results

Proposal ID	BT_481	BT_129
Proposal Description	Rebuild Michigan City-Trail Creek-Bosserman 138 kV (10.7mi)	New Kuchar station and new Kutchar-Luchtman 138kV line (10.5mi)
Project Type	Upgrade	Greenfield
B/C Ratio Metric	Lower Voltage	Lower Voltage
In-Service Cost (\$MM)**	\$20.99	\$27.62
Cost Containment	No	No
In-Service Year	2023	2023
% Cong Driver Mitigated	100%	95%
2023 Shifted Cong (\$MM)	\$0.04	-
Base Case B/C Ratio*	3.10	2.04
FSA Sens. B/C Ratio*	6.04	4.70
PJM Benefit Metric (\$MM)	69.16	60.01

*Base Case updated with the Maple-LNG rating increase.

**Results are preliminary as costs under review by PJM



Marblehead Transformer Proposals Preliminary Results

Proposal ID	MH_322	MH_506
Proposal Description	Rebuild Palmyra-Marblehead 161 kV and Marblehead-Herleman 138 kV lines (12mi). New 345 kV ring bus at the Palmyra substation.	Rebuild Palmyra-Marblehead 161 kV and Marblehead-Herleman 138 kV lines. New Maywood-Palmyra 345 kV line (15mi).
Project Type	Upgrade	Greenfield
B/C Ratio Metric	Lower Voltage	Lower Voltage
In-Service Cost (\$MM)*	\$35.95	\$36.02
Cost Containment	No	No
In-Service Year	2023	2023
% Cong Driver Mitigated	100%	100%
2023 Shifted Cong (\$MM)	\$0.11	\$0.13
Base Case B/C Ratio*	0.36	0.68
FSA Sens. B/C Ratio*	0.18	0.16
PJM Benefit Metric (\$MM)	13.90	25.86

**Base Case updated with the Maple-LNG rating increase*

***Costs under review by PJM*

Appendix B

Hunterstown – Lincoln Proposals Preliminary Results (Highest 5 B/C Ratios)



Hunterstown-Lincoln Updated Results (Highest 5 B/C Ratios)

Proposal ID	HL_469**	HL_622	HL_007	HL_960	BT_293
Proposal Description	Install SmartWire** power flow control 5% series reactance device in series with the Lincoln Tap-Hunterstown 115 kV line.	Rebuild the Hunterstown-Lincoln 115 kV line.	Build a 115 kV ring bus at the Lincoln tap.	Build new Hunterstown-Lincoln 115 kV line.	Build Meade 115 kV substation.
Project Type	Greenfield***	Upgrade	Greenfield	Greenfield	Greenfield
B/C Ratio Metric	Lower Voltage	Lower Voltage	Lower Voltage	Lower Voltage	Lower Voltage
In-Service Cost (\$MM)**	\$4.65	\$7.21	\$7.58	\$10.13	\$8.95
Cost Containment	No	No	No	Yes	No
In-Service Year	2022	2023	2023	2021	2023
% Cong Driver Mitigated	100%	100%	86%	100%	86%
2023 Shifted Cong (\$MM)	\$2.03	\$1.77	\$1.35	\$1.89	\$1.35
Base Case B/C Ratio*	111.64	76.41	53.16	52.23	45.02
FSA Sens. B/C Ratio*	15.90	8.87	6.79	6.83	5.75

*Base Case updated with the Maple-LNG rating increase

**Results are preliminary as costs under review by PJM

***PJM seeking clarity on installation details and project

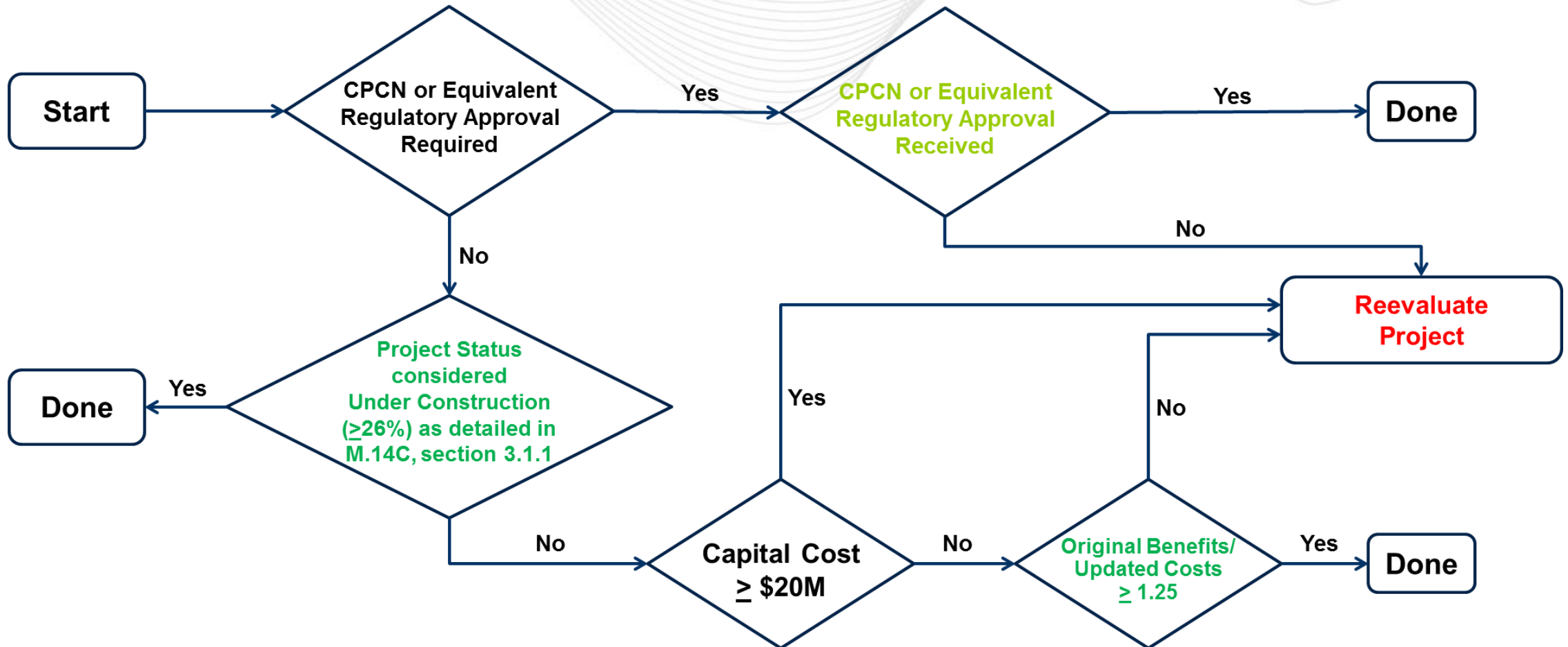
Appendix C

MEPETF Phase 2 – PJM Proposal “A” Reevaluation Criteria



MEPETF Package A Proposal - Reevaluation

Design Component	Status Quo	Modification	Justification
<p>Project Reevaluation Criteria</p>	<p>Costs and benefits of new economic-based enhancements or expansions to be evaluated annually to ensure these projects continue to be economical</p>	<p>1. As applicable, PJM will not reevaluate any project once the Certificate of Public Convenience and Necessity CPCN or equivalent state approval is received (approved). If no CPCN or equivalent state approval is required PJM will not reevaluate any project once the project has completed 26% of its construction phase as described on PJM transmission construction status page. 2. For approved Market Efficiency projects with a capital cost under \$20M: if the updated costs causes the B/C ratio to fall below 1.25, given the original benefits, PJM will reevaluate the need for the project. Projects with a capital cost under \$20M will not be reevaluated if the updated costs do not cause the B/C ratio to fall below 1.25, given the original benefits</p>	<p>Due to the increasing number of projects PJM must reevaluate and the ambiguity involved with how and under what assumptions projects are studied, PJM recommends added structure to enhance transparency and efficiency of the reevaluation process</p>



Note: PJM reserves the right to reevaluate any project.



Revision History

09/09/2019 – V1 – Original version posted to pjm.com