



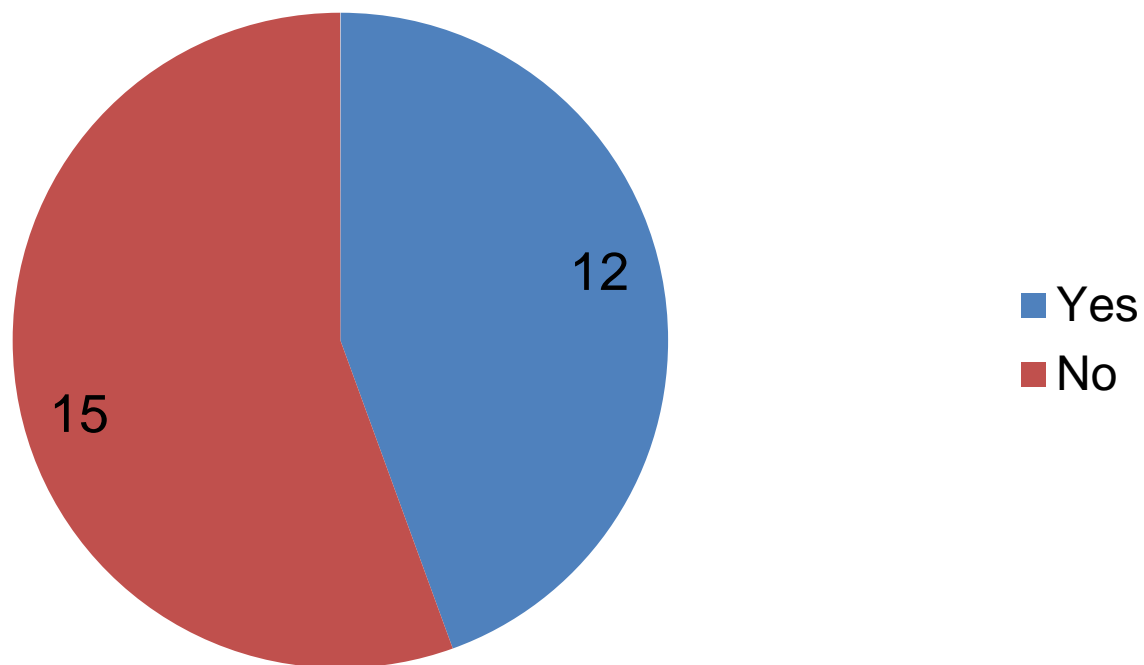
MISO PJM IPSAC

September 30, 2016

- TMEP Survey Results
- TMEP Final JOA Language
- TMEP Study Initial Results
- FERC EL13-88 Filings
- PJM Issues Review
- IPSAC Work Schedule

TMEP Survey Results

Do you support including congestion hedges when calculating the benefits of TMEPs?

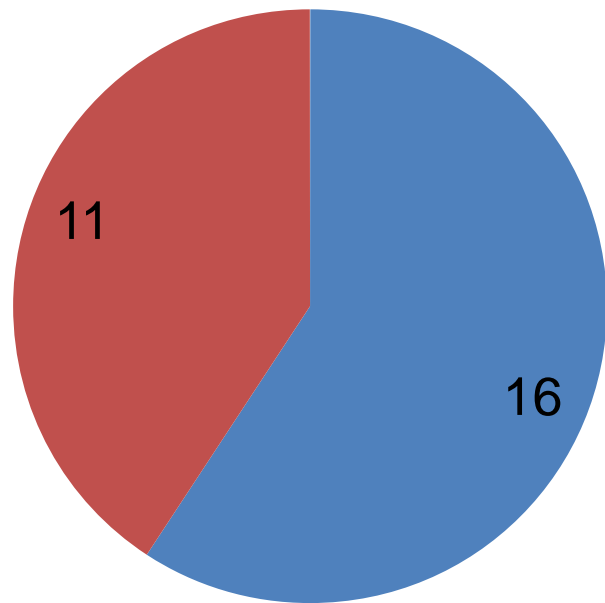


27 Respondents

-12 support subtracting hedges from benefit calculations

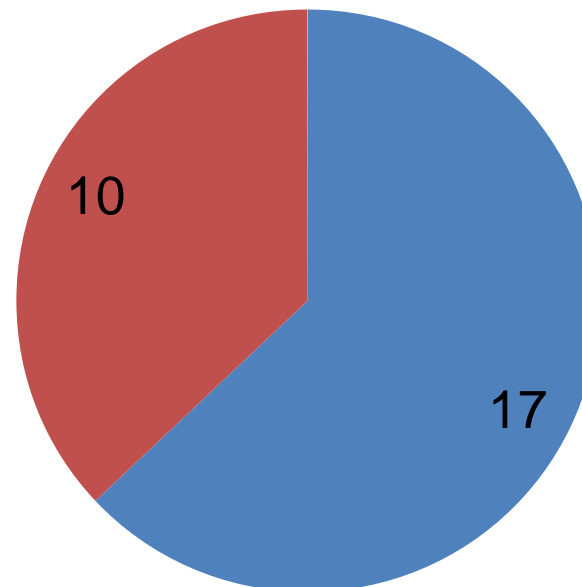
-15 support not subtracting hedges from benefit calculations

Could you live with including congestion hedges?



■ Yes
■ No

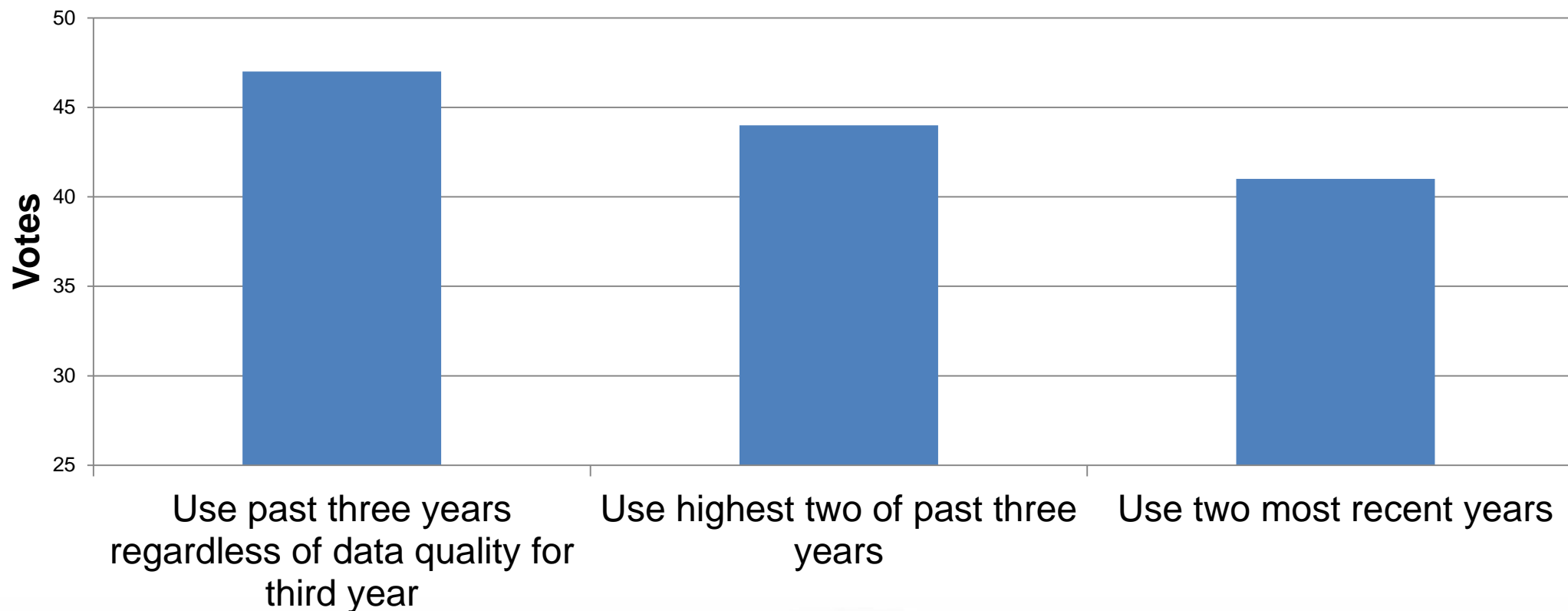
Could you live with not including congestion hedges?




■ Yes
■ No

- Majority of survey respondents would prefer not to include congestion hedges in the benefit calculation
- RTOs will not include the hedge in determination of project benefits
 - Consistent with TMEP goal of simple, efficient metrics easily reproduced by stakeholders
 - Hedge could be used in regional cost allocation

Participants were asked to rank the below three options from 1st choice (1) to last choice (3). Thus, **the lowest total represents the preferred option:**




22
Respondents



	Use past three years regardless of data quality for third year	Use highest two of past three years	Use two most recent years
First Choice (# of votes)	7	9	6
Second Choice (# of votes)	5	4	13
Third Choice (# of votes)	10	9	3

- Use only the past two years of historical congestion
 - First or second choice for vast majority of stakeholders
 - By far the fewest votes as the least preferable option

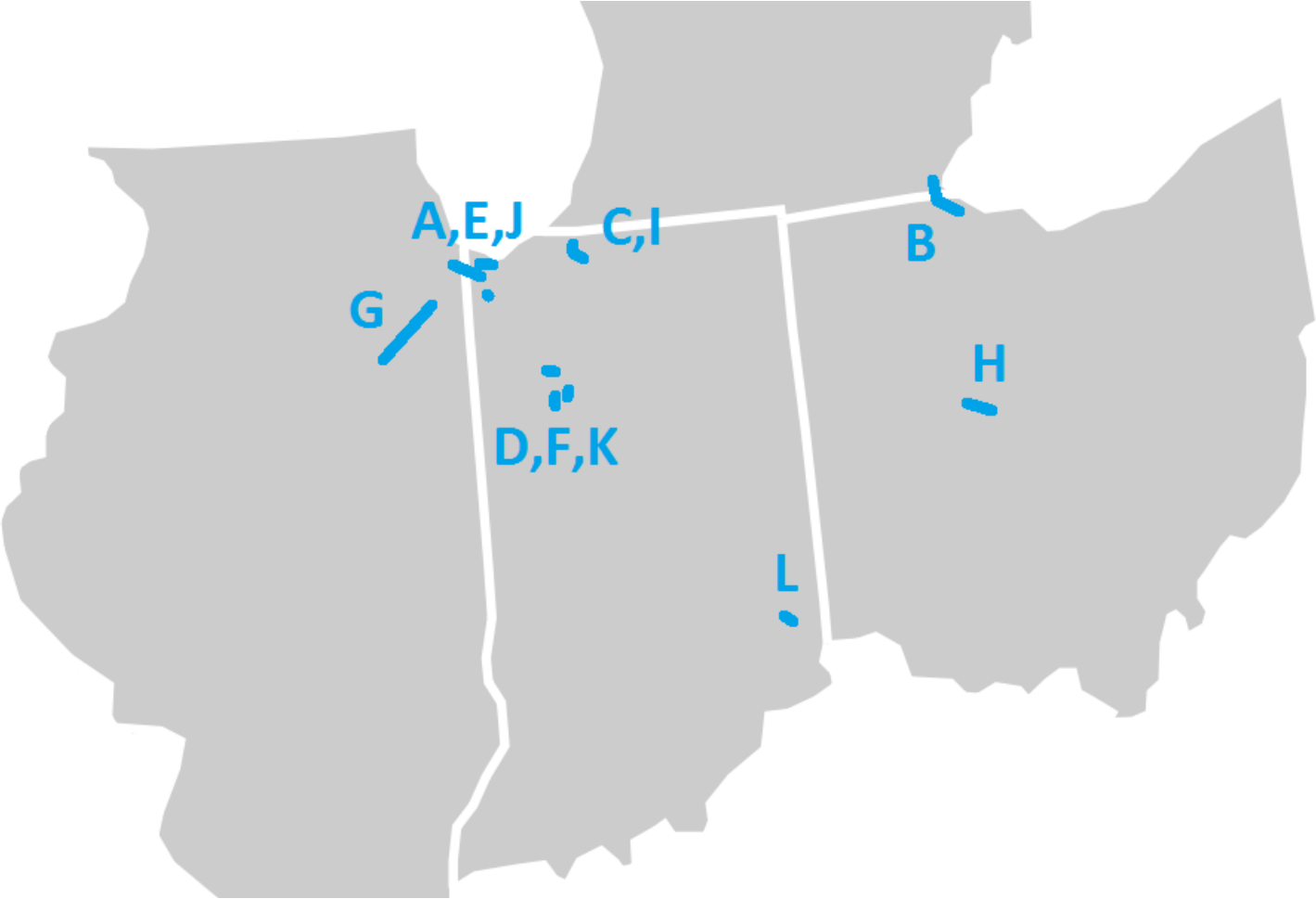
TMEP JOA Language

- 
- Final JOA language, as agreed by the RTOs considering survey results & comments is posted with meeting materials
 - Target filing JOA language with FERC in October
 - Finalizing TMEP analysis for review with IPSAC and JRPC
 - Target submitting selected TMEPs to PJM and MISO boards in December

Targeted Market Efficiency Project Study

- Facility specific information will be reviewed to ensure appropriate treatment of any CEI or confidential information
- List of facilities with potential upgrades has been developed
- RTOs have collaborated on all tie lines to ensure complete information
- Majority of analysis is complete

Letter	Flowgate
A	Burnham – Muster 345 kV
B	Bayshore – Monroe 345 kV
C	Michigan City – Bosserman 138 kV
D	Reynolds – Magnetation 138 kV
E	Roxana – Praxair 138 kV
F	Klondike – Purdue 138 kV
G	Braidwood – East Frankfort 345 kV
H	Marysville – Tangy 345 kV
I	Michigan City – Trail Creek 138 kV
J	Munster 345/138 kV
K	Tippecanoe – Lafayette South 138 kV
L	Batesville – Hubble 138 kV



- NERC FG ID: 2286/2205
- Ownership: CE-NIPS
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 1195/1195
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$6.5M
- Upgraded Rating: 1201/1441

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 1,521,147	\$ 11,540,968	\$ 381,035	\$ 2,559,815
M2M Payment	\$ 398,485	\$ 684,447	\$ (398,485)	\$ (684,447)
Benefit Split	\$ 1,919,632	\$ 12,225,415	\$ -	\$ 1,875,368
Benefit Share	88%		12%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 3.3 M	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: \$6.5M
- TMEP Benefit: \$32 M
- Conclusion: Project Passes

*Note: TMEP Benefit is the average historical congestion * 4 years. See Appendix A for calculation example

Preliminary results – Subject to change

- NERC FG ID: 2647
- Ownership: ATSI – ITC
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 1262/1494
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$1M
- Upgraded Rating: 1486/1702

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 320,517	\$ 7,111,623	\$ -	\$ 2,059,227
M2M Payment	\$ 819,770	\$ 886,991	\$ (819,770)	\$ (886,991)
Benefit Split	\$ 1,140,287	\$ 7,998,614	\$ -	\$ 1,172,236
Benefit Share	89%		11%	

Preliminary results – Subject to change

	Base Case	Project Case
PROMOD Congestion	\$ 3.4 M	\$ 0.24 M

- Congestion moved to downstream flowgates: None
- Analysis Results: Project relieves over 90% of congestion costs
- TMEP Cost: \$1M
- TMEP Benefit: $\$18.9 \text{ M} * 90\% = \17 M
- Conclusion: Project Passes


Preliminary results – Subject to change

- NERC FG ID: 2427/2540
- Ownership: NIPS – AEP
- Outages Impacting: New Carlisle (~20%)
- Planned Upgrades Impacting: None known
- Current Rating: 156/156
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$2.3 M
- Upgraded Rating: 156/221

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 9,885,624	\$ 4,424,258	\$ 2,073,320	\$ 2,106,006
M2M Payment	\$ 315,189	\$ 1,965,922	\$ (315,189)	\$ (1,965,922)
Benefit Split	\$ 10,200,813	\$ 6,390,180	\$ 1,758,131	\$ 140,084
Benefit Share	90%		10%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 9.2 M	\$ 0

- Congestion moved to downstream flowgates: Yes, ~\$100k total increase on Michigan City – Maple and Michigan City – Trail Creek
- Analysis Results: Project is effective at relieving identified congestion, only ~1% increase on nearby flowgates
- TMEP Cost: \$2.3 M
- TMEP Benefit: \$37.0 M (-20% for outage) = \$29.6 M
- Conclusion: Project Passes

Preliminary results – Subject to change

- NERC FG ID: 20729/2548/2685
- Ownership: NIPS
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 287/287
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: 150k
- Upgraded Rating: 287/366

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 17,436	\$ 1,715,417	\$ 216,330	\$ 5,302,529
M2M Payment	\$ 185,737	\$ 1,079,560	\$ (185,737)	\$ (1,079,560)
Benefit Split	\$ 203,173	\$ 2,794,977	\$ 30,593	\$ 4,222,969
Benefit Share	41%		59%	

Preliminary results – Subject to change

	Base Case	Project Case
PROMOD Congestion	\$ 2.43 M	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: 150k
- TMEP Benefit: \$14.5 M
- Conclusion: Project Passes

Preliminary results – Subject to change

- NERC FG ID: 2577/2531
- Ownership: NIPS
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 158/158
- Proposed Upgrade:
 - Operate Dune Acres 345/138 normally closed (replace over-dutied breakers)
 - Upgrade to existing facility (4.5M) 525 MVA rate B

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 128,304	\$ -	\$ 656,246	\$ 5,784,337
M2M Payment	\$ 541,002	\$ 882,612	\$ (541,002)	\$ (882,612)
Benefit Split	\$ 669,306	\$ 882,612	\$ 115,244	\$ 4,901,725
Benefit Share	24%		76%	

Preliminary results – Subject to change

	Base Case	Dune Acres XFMR Closed	Dune Acres XFMR Closed + Upgrade to Existing Facility
PROMOD Congestion	\$ 1.8 M	\$ 0.9 M	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Closing Dune Acres transformer resolves ~50% of congestion, TMEP upgrade relieves the remaining congestion
- TMEP Cost: \$4.5 M
- TMEP Benefit: $\$13.1 \text{ M} * 50\% = \6.5 M
- Conclusion: MISO/NIPSCO should made necessary upgrades to operate the Dune Acres transformer normally closed. TMEP cost split would not apply to this portion. TMEP passes relieving the remaining ~50% of congestion (\$6.5 M benefit)


Preliminary results – Subject to change

- NERC FG ID: 20707/20737
- Ownership: DEI
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 158/158
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$4.2M
- Upgraded Rating: 158/243

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 128,304	\$ -	\$ -	\$ 2,859,503
M2M Payment	\$ -	\$ -	\$ -	\$ -
Benefit Split	\$ 128,304	\$ -	\$ -	\$ 2,859,503
Benefit Share	4%		96%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 2.28 M	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: \$4.2M
- TMEP Benefit: \$6.0 M
- Conclusion: Project Passes

Preliminary results – Subject to change

- NERC FG ID: 2207
- Ownership: CE
- Outages Impacting: None known
- Planned Upgrades Impacting:
 - s0756.1, replace breaker. New rating: 1334/1528. ISD 6/1/2017
 - s0756.2, replace breaker. New rating: 1334/1528. Complete
- Current Rating: 1245/1341
- Upgrade Cost: Planned supplemental projects (CE)


Preliminary results – Subject to change

- NERC FG ID: 2395
- Ownership: AEP – ATSI
- Outages Impacting: Marysville – Haytop (~5%)
- Planned Upgrades Impacting: n4148 would have impacted, but project was cancelled
- Current Rating: 897/897
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: minimal
- Upgraded Rating: 1396/1667

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 1,543,508	\$ 4,659,996	\$ -	\$ 156,138
M2M Payment	\$ -	\$ -	\$ -	\$ -
Benefit Split	\$ 1,543,508	\$ 4,659,996	\$ -	\$ 156,138
Benefit Share	98%		2%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 0.18 M	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: minimal
- TMEP Benefit: \$12.7 M (-5% outage) = \$12 M
- Conclusion: Project Passes


Preliminary results – Subject to change

- NERC FG ID: 2578
- Ownership: NIPS
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 156/156
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$1.8M
- Upgraded Rating: 156/221

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 244,599	\$ -	\$ -	\$ 863,746
M2M Payment	\$ 447,999	\$ 2,064,646	\$ (447,999)	\$ (2,064,646)
Benefit Split	\$ 692,598	\$ 2,064,646	\$ -	\$ -
Benefit Share	100%		0%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 2.57 M	\$ 0

- Congestion moved to downstream flowgates: Yes, significant congestion moves to Michigan City – Dune Acres
- Analysis Results: Significant congestion shifted to alternate facilities suggests that additional reinforcements may be required
- TMEP Cost: \$1.8M
- TMEP Benefit: \$2.2 M
- Conclusion: Additional analysis of additional reinforcements required. Given low TMEP benefit, may be more successful in MEP process

Preliminary results – Subject to change

- NERC FG ID: 20865
- Ownership: NIPS
- Outages Impacting: Lake George – Munster (100%?)
- Planned Upgrades Impacting: None known
- Current Rating: 287/287
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$5.5M
- Upgraded Rating: ???/560

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ -	\$ 1,485,379	\$ -	\$ 1,765,401
M2M Payment	\$ -	\$ 2,227,586	\$ -	\$ (2,227,586)
Benefit Split	\$ -	\$ 3,712,965	\$ -	\$ -
Benefit Share	100%		0%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 2.44	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: \$5.5M
- TMEP Benefit: 0 (outage driven)
- Conclusion: Congestion appears to be all outage driven, no upgrade recommended at this time

Preliminary results – Subject to change

- NERC FG ID: 20849/21139
- Ownership: DEI
- Outages Impacting: None known
- Planned Upgrades Impacting: None known
- Current Rating: 178/178
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$6.6M
- Upgraded Rating: ???/301

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ -	\$ 182,308	\$ -	\$ 247,307
M2M Payment	\$ -	\$ -	\$ -	\$ -
Benefit Split	\$ -	\$ 182,308	\$ -	\$ 247,307
Benefit Share	42%		58%	

Preliminary results – Subject to change

	Base Case	Project Case
PROMOD Congestion	\$ 0.60	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: \$6.6M
- TMEP Benefit: \$0.9 M
- Conclusion: Benefits do not justify project cost at this time. Re-evaluate next year


Preliminary results – Subject to change

- NERC FG ID: 2445
- Ownership: DEI – HE
- Outages Impacting: None known
- Planned Upgrades Impacting: b2634, b2634.1 (ISD: 12/31/2017)
 - Reconfiguration of Miami Fort station; may impact flows in area
- Current Rating: 261/261
- Upgrade Type: Upgrade to existing facility
- Upgrade Cost: \$25M
- Upgraded Rating: ???/582

Preliminary results – Subject to change

	PJM		MISO	
	2014	2015	2014	2015
Congestion	\$ 2,390,540	\$ 535,687	\$ 34,357	\$ 984,204
M2M Payment	\$ 605,665	\$ 4,085,757	\$ (605,665)	\$ (4,085,757)
Benefit Split	\$ 2,996,205	\$ 4,621,444	\$ -	\$ -
Benefit Share	100%		0%	

Preliminary results – Subject to change



	Base Case	Project Case
PROMOD Congestion	\$ 1.65 M	\$ 0

- Congestion moved to downstream flowgates: None
- Analysis Results: Project is effective at relieving identified congestion
- TMEP Cost: \$25M
- TMEP Benefit: \$ 7.9 M
- Conclusion: Benefits do not justify project cost at this time. Re-evaluate next year

Preliminary results – Subject to change

- NERC FG ID: 3654
- Ownership: DEI
- Outages Impacting: None known
- Planned Upgrades Impacting: Recently rebuilt to 301 MVA
 - Upgrade recently completed. No additional work recommended at this time.

Preliminary results – Subject to change

Facility	Transmission Owner	TMEP Cost (Million \$)	TMEP Benefit (Million \$)	Benefit Allocation (%PJM/%MISO)
Burnham - Munster 345kV	CE - NIPS	6.5	32	88/12
Bayshore - Monroe 345kV	ATSI - ITC	1	17	89/11
Michigan City – Bosserman 138kV	NIPS - AEP	2.3	29.6	90/10
Reynolds-Magnetation 138kV	NIPS	0.15	14.5	41/59
Roxana - Praxair 138kV *	NIPS	4.5	6.5	24/76
Klondike-Purdue 138kV	DEI	4.2	6	4/96
Marysville-Tangy 345kV	AEP/ATSI	"minimal"	12	98/2

* TMEP assumes Dune Acres 345/138 XFMR operated closed

Preliminary results – Subject to change

FERC Order on EL13-88

FERC Directed Stakeholder Involvement

Deliverable		Due Dates (2016)				Stakeholder Forum
		20-Jun	19-Aug	18-Oct	15-Dec	
Directive P186	Include Generator Retirement Coordination Procedures in JOA	X	X	X	X	IPSAC, PSC, PC
Informational P186	Status Reports on Gen Retirement Coordination Language					
Informational P92	Joint Model in Regional Processes			X		IPSAC, PSC, PC

No FERC Directed Stakeholder Involvement


Deliverable		Due Dates (2016)		Stakeholder Forum (Informational Updates)
		20-Jun	19-Aug	
Directive P57	Formalize Steps and Deadlines in CSP Study	X		IPSAC, PAC, TEAC
Directive P131	Lower Interregional MEP Thresholds	X		IPSAC, RECB, TEAC
Directive P132	Remove Interregional B/C Ratio	X		IPSAC, RECB, TEAC
Directive P133	Revise Benefit Calculation of Interregional MEPs	X		IPSAC, RECB, TEAC
Directive P185	Include BPM GI Coordination Procedures in JOA	X		IPSAC, PSC, TEAC
Informational P58	Aligning Interregional, MTEP, and RTEP		X	IPSAC

- Directs MISO and PJM to submit an informational report describing how MISO and PJM could implement a joint model with the same assumptions and criteria in their regional transmission planning processes
 - Address reliability and economic modeling
- PJM and MISO seek stakeholder input by Friday, October 7, 2016
 - Some PJM and MISO thoughts follow
 - Is the general approach reasonable
 - Explain if you believe common models are feasible or not
 - Additional Issues?

- Joint models combine regional assumptions
 - Include respective regional assumptions
 - Compromise assumptions when necessary
 - Will always differ from regional models
- Regional models are based on regional planning process tariff requirements
 - Transmission Planning
 - Capacity Markets
- A regional solution on one interface does not address need to coordinate the same assumptions on other interfaces in a consistent fashion
- PJM and MISO drivers for regional transmission planning differ significantly
- Common assumptions are not feasible without significant changes to regional processes
- Even identical models would lead to different results when used in different regional processes

- Examples of differing regional drivers
 - MISO Reliability – analysis using multiple Transmission Planners' models
 - Years 2, 5, and 10 using both local balancing area (BA) and MISO BA dispatches
 - Can combine with or be deferred by economic upgrades
 - PJM Reliability – analysis using single Transmission Planner models
 - Years 5, 7 and 8 using PJM balancing area dispatch
 - Reliability projects can not be displaced by economic projects
 - MISO production cost models
 - Scope and assumptions varies cycle to cycle
 - Studied in parallel with reliability planning
 - Multiple generation and assumption futures
 - PJM production cost models
 - Market efficiency Scope and assumptions consistent with reliability planning
 - Public Policy Planning driven by scenarios chosen by Independent State Agency Committee

PJM Issues Review

- 
- July 29, 2016 – IPSAC was notified of September PJM issues review
 - August 26, 2016 – IPSAC stakeholder input to PJM issues review was due
 - Today – Review identified PJM Issues
 - PJM issues list may be refined over next couple weeks
 - Issues list will be finalized prior to November 1 window opening
 - October IPSAC – PJM will share finalized issues list with IPSAC
 - Draft regional market efficiency case available
 - <http://www.pjm.com/planning/rtep-development/market-efficiency.aspx>
 - Final market efficiency case will be posted prior to November 1 window opening

2015 Historical Market Congestion – Top 20 Congestion Causing Constraints 58

Rank	Constraint	Type	Location	Approximate total Market Congestion (\$)*	% of Total Congestion*	Comment
1	Conastone - Northwest	Line	BGE	\$108.80	7.9%	RTEP upgrades expected to reduce congestion (B0497, B1016, B1251). Partial congestion is outage related (work on BAGLEY-GRACETON).
2	Bagley - Graceton	Line	BGE	\$107.90	7.8%	RTEP upgrades expected to reduce congestion (B0497, B1016, B1251).
3	5004/5005 Interface	Interface	500	\$89.00	6.4%	West - East Transfers.
4	Bedington - Black Oak	Interface	500	\$87.60	6.3%	West - East Transfers.; Future reactive upgrades expected to reduce congestion.
5	Cherry Valley TX	Flowgate	MISO	\$79.60	5.7%	Market to Market Congestion. Partial congestion is outage related (work on 156 CHERRY 45TR81 CT).
6	AP South	Interface	500	\$56.20	4.1%	West - East Transfers; Future reactive upgrades expected to reduce congestion
7	AEP - DOM	Interface	500	\$52.40	3.8%	West - East Transfers; Future reactive upgrades expected to reduce congestion.
8	Joshua Falls	Transformer	AEP	\$44.00	3.2%	
9	Bergen - New Milford	Line	PSEG	(\$43.50)	-3.10%	Congestion is outage related (work on ESSEX-KEARNY, BERGEN-SADDLEBR). Existing PSEG upgrades expected to alleviate future congestion.
10	Person - Halifax	Flowgate	MISO	\$40.00	2.9%	Market to Market Congestion.

2015 Historical Market Congestion – Top 20 Congestion Causing Constraints

Rank	Constraint	Type	Location	Approximate total Market Congestion (\$)*	% of Total Congestion*	Comment
11	Maywood - Saddlebrook	Line	PSEG	(\$23.40)	-1.70%	Congestion is outage related (work on BERGEN-SADDLEBR). Existing PSEG upgrades expected to alleviate future congestion.
12	East	Interface	500	\$22.60	1.6%	West - East Transfers.
13	Easton	Transformer	DPL	\$21.90	1.6%	Congestion is outage related (work on IBCORN-PRICE).
14	Glenarm - Windy Edge	Line	BGE	\$20.50	1.5%	
15	Oak Grove - Galesburg	Flowgate	MISO	\$19.70	1.4%	Market to Market Congestion.
16	Mahans Lane - Tidd	Line	AEP	\$19.60	1.4%	Partial congestion is outage related (work on COLLIER-TIDD). RTEP upgrade expected to reduce future congestion (b2445).
17	East Danville - Banister	Line	AEP	\$19.10	1.4%	RTEP upgrade expected to reduce congestion (b2375).
18	49th Street - Hoboken	Line	PSEG	(\$18.80)	-1.40%	Congestion is outage related (work on ESSEX-KEARNY, BERGEN-SADDLEBR). Existing PSEG upgrades expected to alleviate future congestion.
19	BCPEP	Interface	Pepco	\$18.40	1.3%	RTEP upgrades expected to reduce future congestion (B2443, B2443.3).
20	Braidwood - East Frankfort	Line	ComEd	\$18.10	1.3%	Market to Market Congestion. Partial congestion is outage related (work on CHERRY 45TR81 CT).

Top 20	\$739.70
Total Congestion	\$1,385.3

IPSAC Work Schedule



Q4 2016

- File TMEP language in JOA
- Continue MEP Metric and Process discussions with stakeholders
- Complete TMEP analysis and recommend projects as appropriate
- Identify potential longer term interregional issues from regional processes; solicit projects from stakeholders

- July 29, 2016 – IPSAC & notice of September PJM issues review
 - August 26, 2016 – IPSAC stakeholder input to PJM issues review due
 - October 2016 – IPSAC reviews PJM issues
 - November 1, 2016 – PJM long-term solution proposal window opens
 - February 28, 2017 – PJM long-term solution proposal window closes
-
- October 2016 – IPSAC & notice of December MISO issues review
 - November 2016 – IPSAC & stakeholder input to MISO issues review due
 - December 2016 - IPSAC review MISO issues
 - January – March 2017 – MISO solution proposals accepted



Appendix A

Example TMEP Benefit Calculation

	2014	2015
PJM Congestion	\$ 1,000,000	\$ 1,500,000
MISO Congestion	\$ 1,000,000	\$ 1,250,000
PJM M2M Payment	\$ 150,000	\$ 200,000
MISO M2M Payment	\$ (150,000)	\$ (200,000)
Total Congestion	\$ 2,000,000	\$ 2,750,000

Two years of historical values

Note M2M payments are equal and opposite

Sum of both RTOs

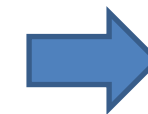
*Note: In this example M2M payments are made by PJM to MISO

*All values and project details are for illustrative purposes only

- Proposed upgrade is replacement of breakers and associated CTs and relays
 - Total cost \$2.5 Million
- Analysis shows project eliminates congestion issue

Annual benefit is average of Total Unhedged Congestion:

	2014	2015
Total Unhedged Congestion	\$ 2,000,000	\$ 2,750,000



\$ 2,375,000

Four years of benefits exceeds the installed cost

$$4 \text{ years} * \$ 2.375 \text{ Million} = \$ 9.5 \text{ Million}$$

$$\$ 9.5 \text{ Million} > \$ 2.5 \text{ Million}$$

The project passes the benefit threshold

*All values and project details are for illustrative purposes only

PJM Total Benefit:	\$ 2,500,000
MISO Total Benefit:	\$ 2,250,000
PJM Total M2M Payments	\$ 350,000
MISO Total M2M Payments	\$ (350,000)
PJM Adjusted Benefit:	\$ 2,850,000
MISO Adjusted Benefit:	\$ 1,900,000
PJM pays:	60%
MISO pays:	40%

Sum of congestion for two historical years

Sum for two historical years

Total Benefit plus M2M Payments

Share of Adjusted Benefits

*All values and project details are for illustrative purposes only