



# Targeted Market Efficiency Projects

FERC TMEP Workshop

June 13, 2017

# Topics

- History - 2015 Quick Hit Studies
- 2016 TMEP Development and Study
- How future TMEP studies will work
- Example of Benefits Split

# 2015 Quick Hits Studies

| Goals                                                                                                                                                                                                                                                                                                                                       | Study Method                                                                                                                                                                                                                                                                | Results                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Identify valuable projects on the MISO-PJM seam</li><li>• Valuable projects are those that:<ul style="list-style-type: none"><li>• Relieve known Market-to-Market issues</li><li>• Can be completed in a relatively short time frame</li><li>• Have quick payback on investment</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Considered flowgates with historical Market-to-Market congestion</li><li>• Worked with facility owners to identify limiting equipment and potential upgrades</li><li>• Performed analysis to verify upgrade effectiveness</li></ul> | <ul style="list-style-type: none"><li>• 39 M2M flowgates investigated</li><li>• 4 projects recommended<ul style="list-style-type: none"><li>• \$19 million in historical congestion</li></ul></li><li>• All 4 projects ultimately did not proceed due to planned MTEP or RTEP projects and system reconfiguration</li><li>• MISO, PJM &amp; stakeholders saw the benefit for memorializing this new project type</li></ul> |

# 2016 TMEP Development

## Formalization

- Parallel effort in coordination with MISO-PJM IPSAC
- Perform another newly-renamed Targeted Market Efficiency Project (TMEP) study
- Create a new, interregional project type to support upgrades resulting from this and future TMEP studies

## Guiding Principles

- Small, low cost, short lead time upgrades
- Targeted at specific, historical congestion issues
- Straight forward method for benefit determination
- Can be replicated by stakeholders
- Avoid complicated analysis (production cost models & simulations) which could delay implementation

## Key Points

- Limited to Market to Market flowgates
- Projects must be in-service by 3<sup>rd</sup> summer peak
- Projects over \$20 million not eligible (must go through Market Efficiency Project process)
- Benefits based on 2 years of historical congestion
- Four years worth of benefits must cover project's installed capital cost

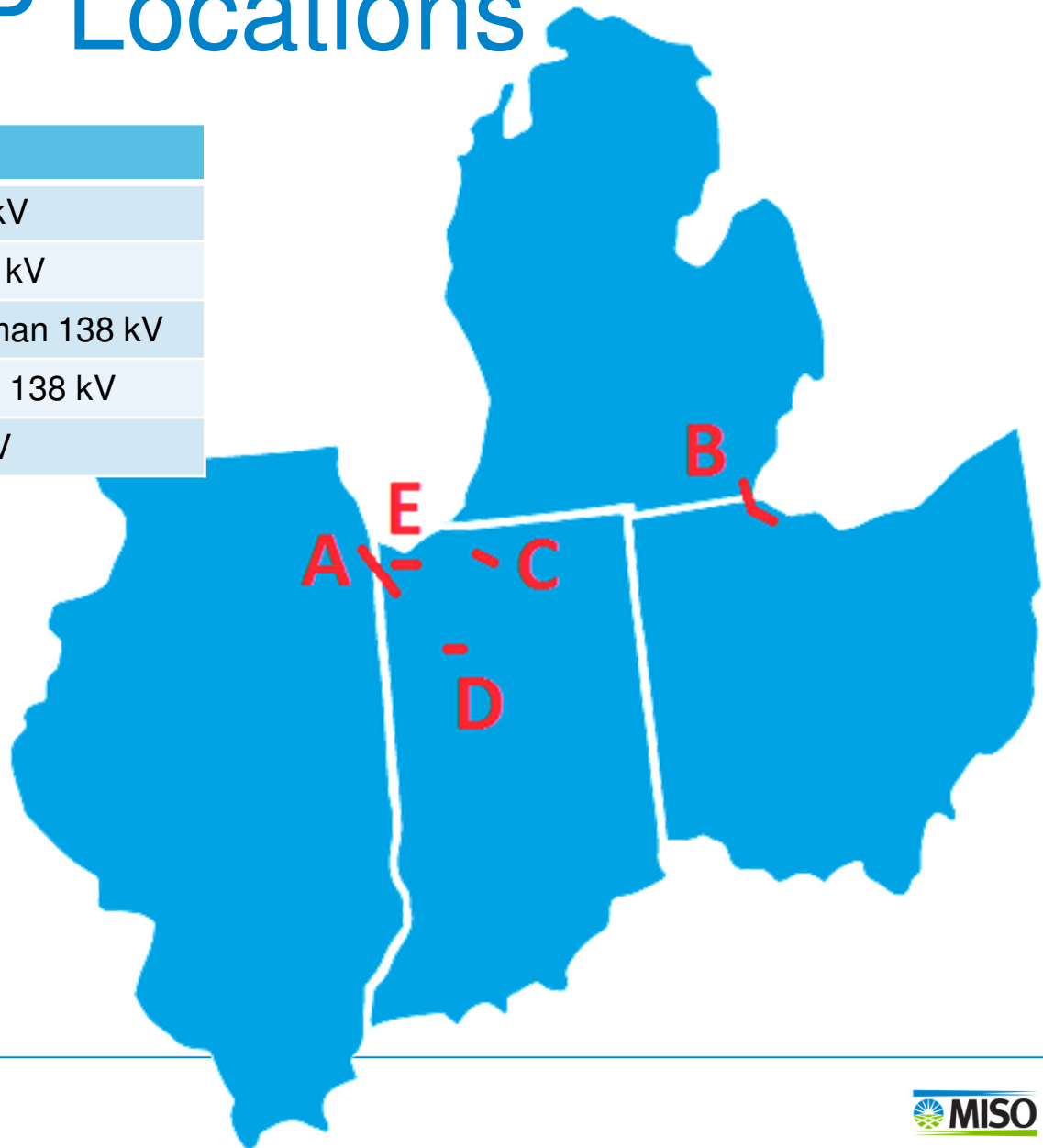
# Interregional Benefits Split

TMEP benefits include the avoidance of future Day Ahead (DA) and MISO Real Time Excess Congestion Fund ( RT ECF) and PJM Balancing congestion

- Ratio of MISO and PJM congestion costs
- Sum of Day Ahead and Excess Congestion Fund (aka Balancing) congestion
- Congestion ratio will be adjusted by Market to Market payments
  - Payments from PJM to MISO will be discounted from MISO's congestion and added to PJM's (and vice versa)

# 2016 TMEP Locations

| ID | 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          |



# 2016 TMEP Study Summary

- 50 M2M flowgates investigated
- 13 potential upgrades evaluated
- 5 projects recommended
  - \$59 million in historical congestion (2014 + 2015)
  - \$99.6 million estimated TMEP benefit
  - \$17.25 million estimated TMEP cost
  - 5.8 average benefit/cost ratio

# Summary of 2016 TMEPs

| Facility                        | Transmission Owner | TMEP Cost (Million \$) | TMEP Benefit (Million \$) | Benefit Allocation (%PJM/%MISO) |
|---------------------------------|--------------------|------------------------|---------------------------|---------------------------------|
| Burnham - Munster 345kV         | CE - NIPS          | 7                      | 32                        | 88/12                           |
| Bayshore - Monroe 345kV         | ATSI - ITC         | 1                      | 17                        | 89/11                           |
| Michigan City – Bosserman 138kV | NIPS - AEP         | 4.6                    | 29.6                      | 90/10                           |
| Reynolds-Magnetation 138kV      | NIPS               | 0.15                   | 14.5                      | 41/59                           |
| Roxana - Praxair 138kV          | NIPS               | 4.5                    | 6.5                       | 24/76                           |
| <b>Total</b>                    |                    | <b>17.25</b>           | <b>99.6</b>               | <b>71/29</b>                    |



# Future TMEP Process

## Gather Congested Flowgate Data

- Identify flowgates with high historical Market-to-Market congestion (>\$1 million) over the evaluation period (2 previous years).
- MISO Day Ahead and Real Time Excess Congest Fund / PJM Day Ahead and Balancing
- Seek stakeholder feedback

## Identify Potential Upgrades

- Work with facility owners to identify limiting equipment and potential upgrades. If none, do not pursue TMEP.
- Seek stakeholder feedback

## Congestion Persistence

- Work with MISO and PJM Operations to look at system conditions when congestion occurred. Seek stakeholder feedback.
- Is persistent congestion expected in the future. If no, do not pursue TMEP.
- Identify any planned MTEP or RTEP projects which would alleviate the congestion. If no, pursue TMEP.

## Verify Effectiveness

- Perform analysis to verify upgrade effectiveness
- Seek stakeholder feedback

## Qualification

- Perform a benefit to cost analysis of the project, ensuring that 4 times the average yearly congestion is greater than the project's capital cost
- Ensure that the project will be in-service within the 3<sup>rd</sup> summer peak to realize congestion savings
- Joint RTO Planning Committee will recommend TMEP projects to RTO Boards

# Interregional Flowgate Congestion Example

|                  | 2014         | 2015         |                                          |
|------------------|--------------|--------------|------------------------------------------|
| PJM Congestion   | \$ 1,000,000 | \$ 1,500,000 | Two years of historical values           |
| MISO Congestion  | \$ 1,000,000 | \$ 1,250,000 |                                          |
| PJM M2M Payment  | \$ 150,000   | \$ 200,000   | Note M2M payments are equal and opposite |
| MISO M2M Payment | \$ (150,000) | \$ (200,000) |                                          |
| Total Congestion | \$ 2,000,000 | \$ 2,750,000 | 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

# Interregional Benefit Calculation

- 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

$$4 \text{ years} * \$2.375 \text{ Million} = \$9.5 \text{ Million} > \$2.5 \text{ Million}$$

The project passes the benefit threshold

\*All values and project details are for illustrative purposes only

# Inter-RTO Benefit Split

|                         |              |                                            |
|-------------------------|--------------|--------------------------------------------|
| PJM Total Benefit:      | \$ 2,500,000 | Sum of congestion for two historical years |
| MISO Total Benefit:     | \$ 2,250,000 |                                            |
| PJM Total M2M Payments  | \$ 350,000   | Sum for two historical years               |
| MISO Total M2M Payments | \$ (350,000) |                                            |
| PJM Adjusted Benefit:   | \$ 2,850,000 | Total Benefit plus M2M Payments            |
| MISO Adjusted Benefit:  | \$ 1,900,000 |                                            |
| PJM Benefit %:          | 60%          | Share of Adjusted Benefits                 |
| MISO Benefit %:         | 40%          |                                            |

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