

# Welcome to Partners in Business

October 8, 2024



**Cheri Monahan**

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**FOR THE GREATER GRID**

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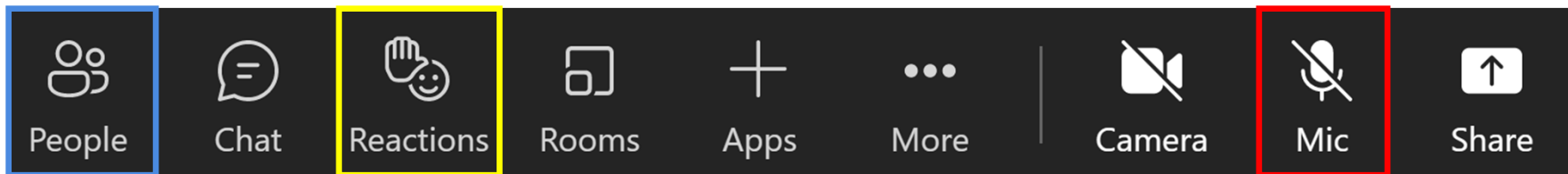
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# Today's Facility and Meeting Accommodations

- Register for meeting: take your badge and enter drawing
- Refreshments
- Relax, enjoy, and ask questions
- Restroom and facility locations
- Lunch
- Professional Development Hours (PDH) Attendance Form
  - Reach out to Aaron Curtis in-person or email
- Introductions

# Virtual Meeting Reminders



Click "People" to view virtual participants

If you have a question, please raise your hand and we will call on you

Please stay on mute unless you have a question

# Presentations Available Online

ITC Midwest website:

<https://www.itc-holdings.com/itc-midwest/customer-solutions/partners-in-business/>

MISO OASIS website:

<http://www.oasis.oati.com/ITCM/index.html>

Feedback for today's meeting:

<https://forms.office.com/r/LnYBVdQrcs>



# Today's Themes

## ITC Midwest Update

*Dusky Terry*

## Stakeholder Survey and Analysis

*Karen Hilton*

## Transmission Operations

*Mitch Myhre, Abubaker Elteriefi, and Rodolfo Lozano*

## Economic Development and 2025 Formula Rate

*Cheri Monahan and Matt Bogdan*

## LRTP and ITC Midwest Projects

*Robert Walter*

# Safety Message



**Aaron Curtis**

*Manager, Customer & Business Solutions*  
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# ITC Midwest Update



**Dusky Terry**

*President, ITC Midwest*  
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# Questions?



**Dusky Terry**

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# 2024 ITC Midwest Survey

Partners in Business Meeting



October 2024

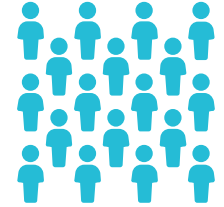


## Introduction

*For the sixth time, ITC Midwest's Stakeholder Relations department conducted a survey of customers in the Midwest region with the following objectives:*

- 01** **Understand** customer satisfaction with ITC Midwest personnel and ITC Midwest overall
- 02** **Compare** current performance to the prior survey cycles
- 03** **Solicit** ideas for how ITC Midwest can add value for its customers

**564**  
Contacts



**89**  
Responses



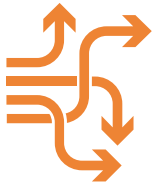
**16%**  
Response Rate



## Summary of Findings



Overall satisfaction remains **very positive** with a mean score above a 4.0 for the first time in the survey's history



While 2024 results indicate more **decreases** than **increases** in mean scores from 2021, all scores remain positive with scores of 3.5 or higher



Questions regarding the way customers are treated by ITC Midwest staff are among the **most favorable** questions in the survey

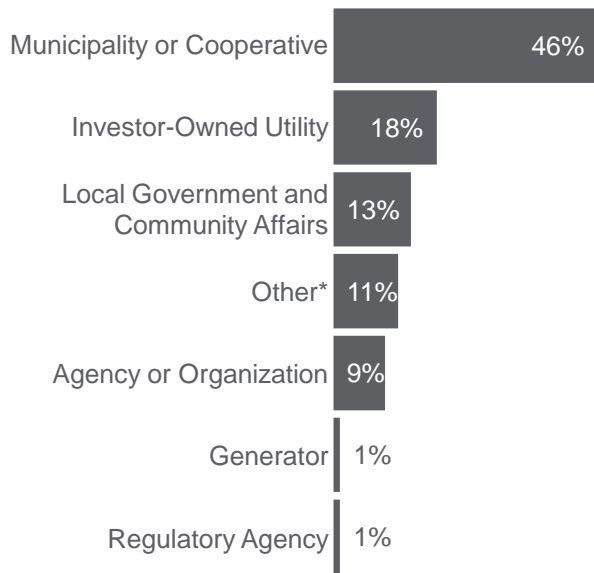


**Lower scores** are consistently related to ITC Midwest's flexibility, cost of service, and proactive communication

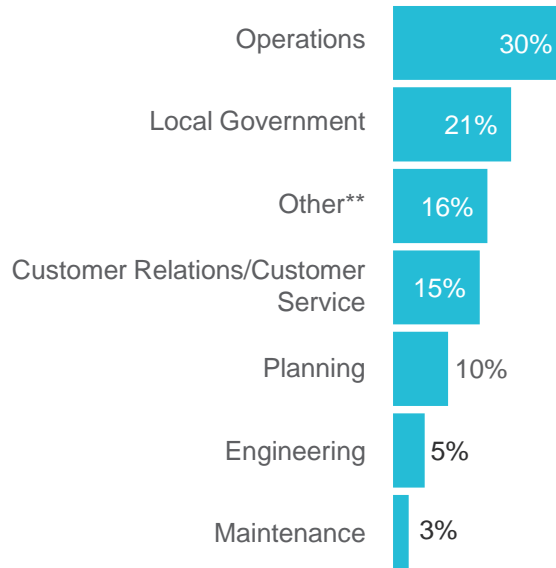
# Survey Demographics

Nearly half of respondents came from a Municipality or Cooperative, while around one-third of respondents came from Investor-Owned Utilities and Local Government and Community Affairs. Generators and 'Agency or Organization' represent a smaller portion of respondents compared to 2021.

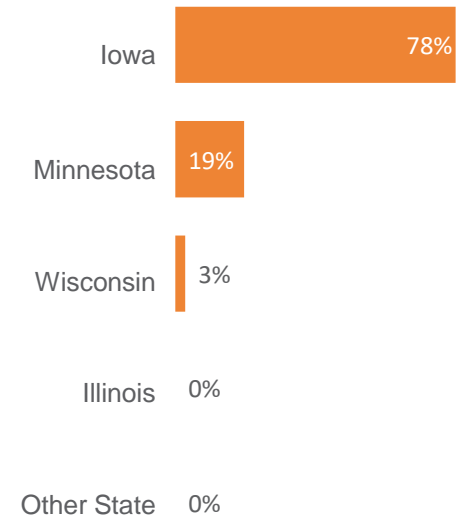
What type of entity is your organization?



Which of the following most closely describes your role in the organization?

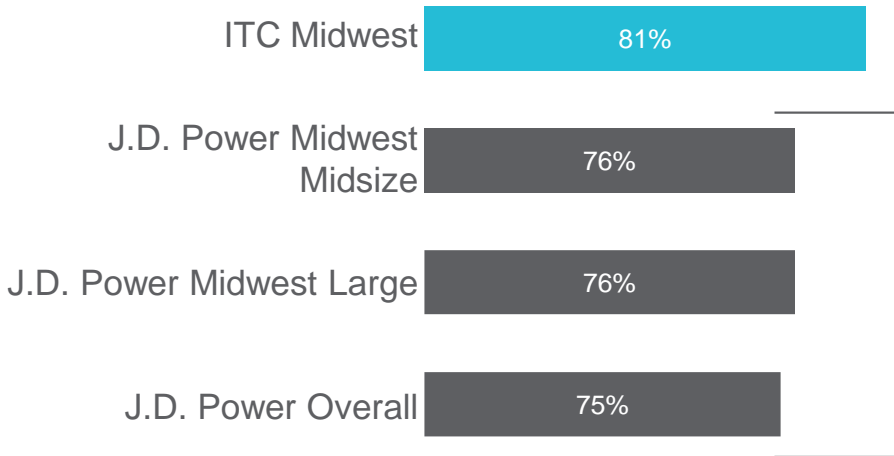


Are you located in:



# ITC Midwest Benchmark Comparison

## Normalized Overall Satisfaction



ITC Midwest continues to perform well in comparison with available utility benchmarks, scoring above the J.D. Power Electric Utility Business Satisfaction scores

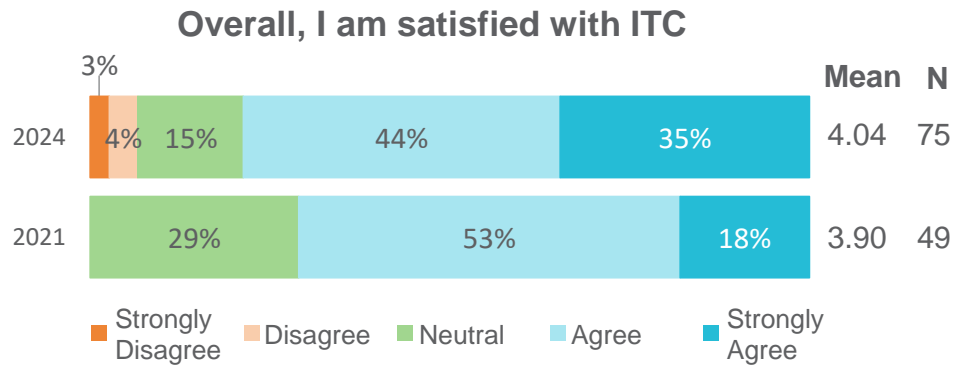
The 2023 Electric Utility Business Customer Satisfaction Study evaluated the satisfaction of business customers from 79 specific U.S. electric utilities

Source: J.D. Power. 2023 Electric Utility Business Customer Satisfaction Study. Retrieved from <https://www.jdpower.com/business/press-releases/2023-electric-utility-business-customer-satisfaction-study>

# Overall Satisfaction and Value of Service

Overall satisfaction among stakeholders remains very positive, exceeding 4.0 for the first time in the survey's history

Participants were asked to rank which factors are most important to them in determining the value of ITC Midwest transmission services

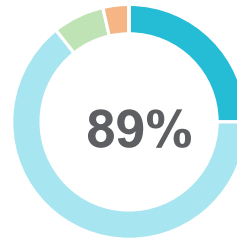


Most Important Factors	Average Rank
Reliability of Service	1.9
Outage Response	3.2
Communication timeliness and effectiveness	4.0
Planning Information	4.2
Expertise/Knowledge of the system and transmission issue	4.3

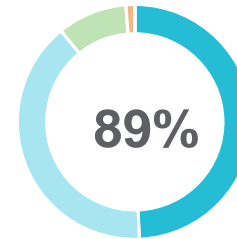
# Five Most Favorable Scores (Agree % + Strongly Agree %)



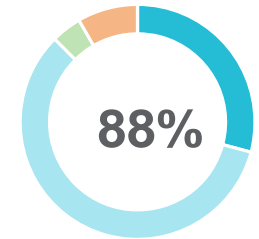
2 of the 5 most favorable questions relate to **ITC Midwest personnel**



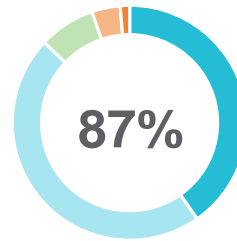
**OUTAGE SCHEDULING**  
ITC Midwest is **proactive** in informing me of scheduled outages.



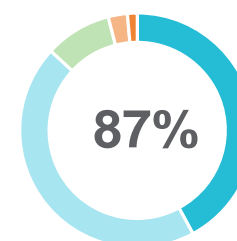
**PERFORMANCE**  
When dealing with ITC Midwest, I am treated with **consideration and respect**



**PARTNERS IN BUSINESS**  
The Partners in Business meetings are **informative and helpful**.



**ITC PERSONNEL**  
ITC Midwest personnel are **available** when I need them



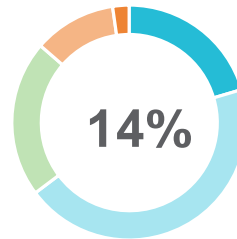
**ITC PERSONNEL**  
ITC Midwest personnel are **pleasant, accommodating and treat me with respect**

Strongly Disagree Disagree Neutral Agree Strongly Agree

# Five Most Unfavorable Scores (Disagree % + Strongly Disagree %)

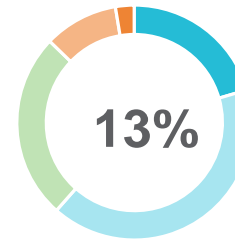


*Flexibility and a proactive communication approach are key factors in customer satisfaction*



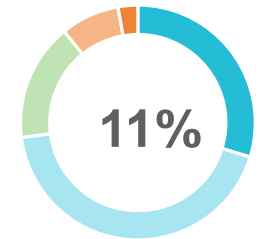
### ITC RELATIONSHIP

*ITC Midwest is flexible and accommodating in the way it conducts business*



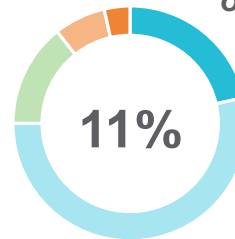
### UNPLANNED OUTAGES

*The information communicated by ITC Midwest during unplanned outages meets my expectations*



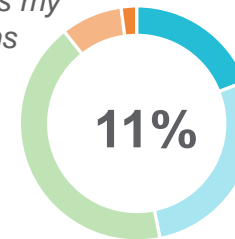
### OVERALL SATISFACTION

*I am satisfied with the value of ITC Midwest transmission services*



### OUTAGE SCHEDULING

*CBS coordinates the various parties involved in scheduling an outage and I am kept fully informed of developments*



### CUSTOMER & BUSINESS SOLUTIONS

*ITC Midwest CBS has my best interests in mind*

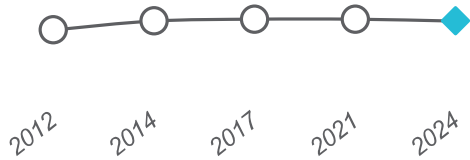
■ Strongly Disagree 
 ■ Disagree 
 ■ Neutral 
 ■ Agree 
 ■ Strongly Agree

# ITC Midwest Relationship Summary

Three out of nine questions in the section had **decreases** of 0.1 or more from 2021



Mean scores for ITC Relationship questions have **steadily increased** from year to year, but have **slightly declined** from 2021



## “ What **Customers** Are Saying\* ”

“I feel ITC could be more flexible when custom designed solutions are required. I also feel ITC could consider not just their customers but their customer's customers.”

“ITC has good people that make themselves available, however they are not empowered to think out of the box on problem solving.”

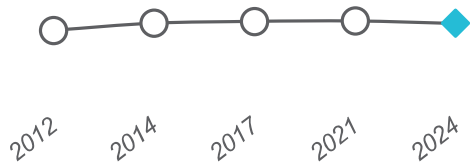
\*Participants were only asked to provide written feedback after a section if they responded unfavorably to any questions within that section. Positive comments related to each section were pulled from the general feedback question at the end of the survey

# Performance Summary

Three out of eight questions in the section had **decreases** of 0.1 or more from 2021



Mean scores for Performance questions have **steadily increased** from year to year, but have **slightly declined** from 2021



## “ What Customers Are Saying\* ”

“ITC has outstanding staff to cover the north Iowa area and communicate new projects. Keep up the good work!!”

“I feel ITC could be more flexible when custom designed solutions are required. I also feel ITC could consider not just their customers but their customer's customers.”

\*Participants were only asked to provide written feedback after a section if they responded unfavorably to any questions within that section. Positive comments related to each section were pulled from the general feedback question at the end of the survey

# Customer & Business Solutions (CBS) Summary

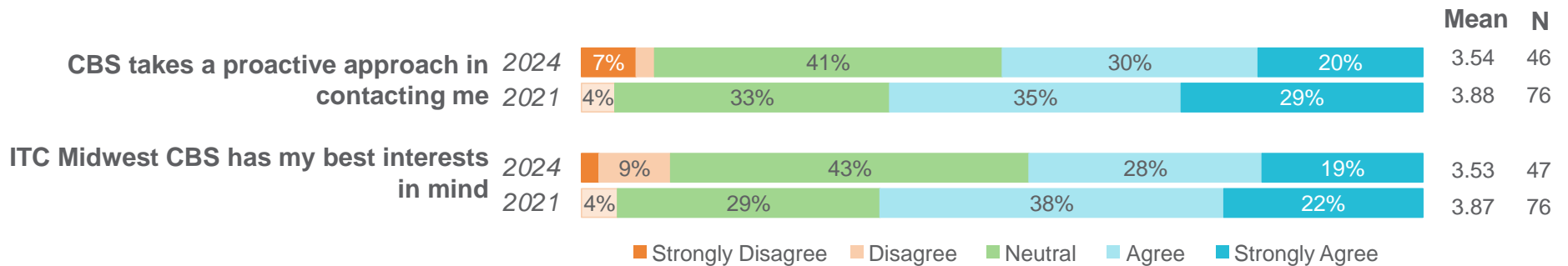
Both questions had **decreases** from 2021 in the Customer & Business Solutions (CBS) section



Have you met the ITC Midwest Customer & Business Solutions Account Manager for your company?

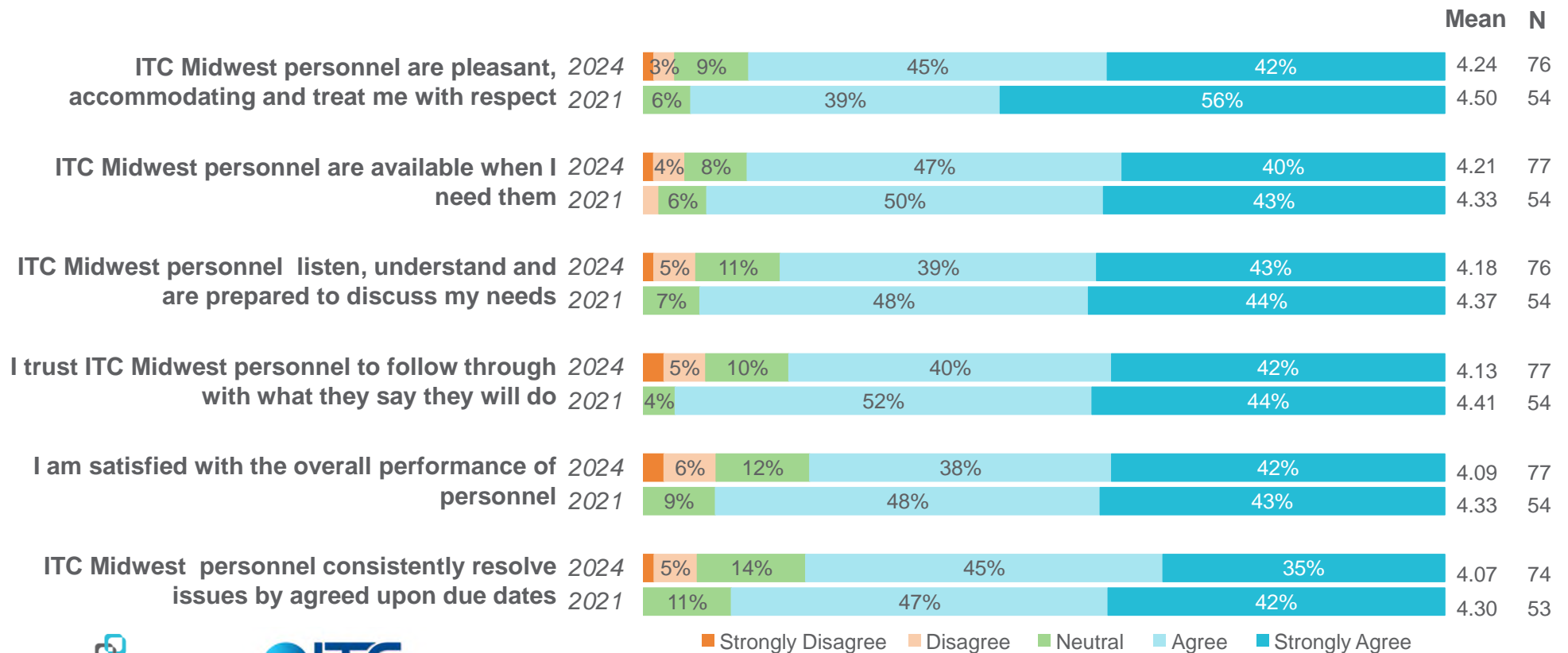


**Yes – 60%**  
**No – 40%**



# ITC Midwest Personnel Summary

The mean scores for ITC Midwest personnel account for **4 of the Top 10 Scores** in the entire survey



Strongly Disagree Disagree Neutral Agree Strongly Agree

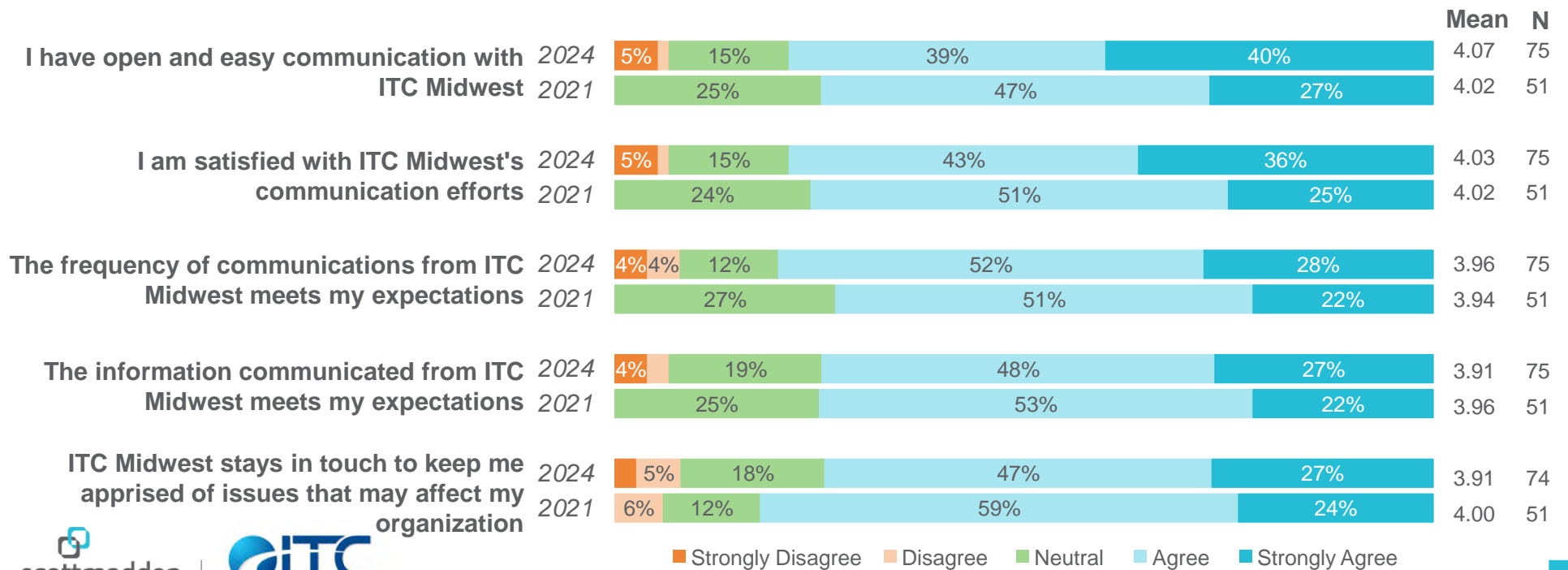


# Communication Summary

All scores in this section were comparable to 2021, remaining **very positive**



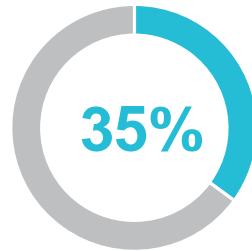
Customers expressed a clear preference for receiving routine communications via **email**. However, 40% still prefer a **phone call** for unplanned outages.



Strongly Disagree Disagree Neutral Agree Strongly Agree

## Partners in Business Summary

Around one-third of the respondents have attended a **Partners in Business Meeting**



Most customers who have attended a Partners in Business Meeting have found them **informative and helpful**, while 4% felt Neutral and 8% Disagreed

# 87% Favorable

“ *What Customers Are Saying* ”

**What topics would you like to see addressed at the Partners in Business meetings?**

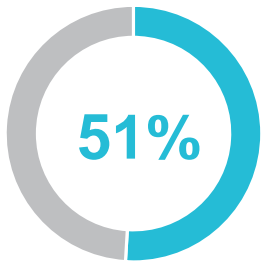
“Work plans.”

“Economic development successes and strategies.”

“Continue focus on ongoing and future projects”

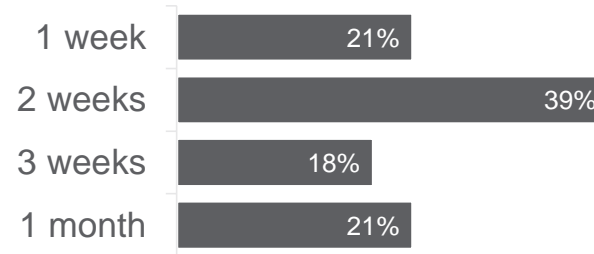
“Would be nice to have a ULC representative at the meeting to get the field's operational viewpoints.”

# Outage Scheduling Summary



Around Half of the respondents are involved in **Planned Outage Scheduling**

What amount of lead time do you expect for receiving notice of scheduled outages?

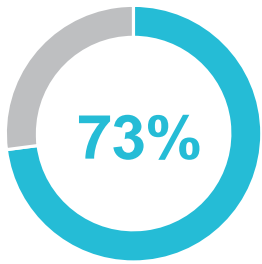


					Mean	N		
ITC Midwest is proactive in informing me of scheduled outages	2024	4%	7%	64%	25%	4.11	28	
	2021	4%		63%	33%	4.22	27	
The lead time with which ITC Midwest communicates scheduled outages meets my expectations	2024		14%	61%	25%	4.11	28	
	2021	4%	4%	74%	19%	4.04	27	
Stakeholder relations coordinates the various parties involved in scheduling an outage and I am kept fully informed of developments	2024	4%	7%	14%	54%	21%	3.82	28
	2021			23%	50%	27%	4.04	26

Strongly Disagree Disagree Neutral Agree Strongly Agree



# Unplanned Outages Summary



Nearly three-quarters of the respondents are responsible for addressing effects of **Unplanned Outages**

Scores in this area remain among some of the **lowest in the survey**, indicating continued opportunities for improvement

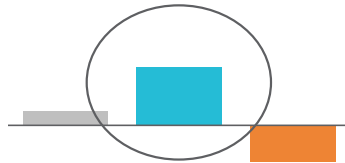


					Mean	N	
The information communicated by ITC Midwest during unplanned outages meets my expectations	2024	10%	26%	41%	21%	3.67	39
	2021	11%	29%	50%	11%	3.61	28
When unplanned outages occur, ITC Midwest provides accurate estimates of restoration times	2024	8%	31%	44%	15%	3.62	39
	2021	11%	25%	54%	11%	3.64	28
The frequency of updates provided by ITC Midwest during unplanned outages meets my expectations	2024	8%	33%	41%	15%	3.59	39
	2021	11%	32%	43%	14%	3.61	28

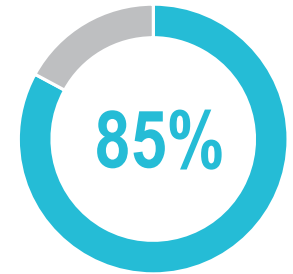
Strongly Disagree Disagree Neutral Agree Strongly Agree

# Quality of Service Summary

The mean score of ITC Midwest promptly addressing power quality issues experienced a large **increase** from 2021 (+0.19)



Around 85% of customers answered **favorably** when asked about ITC Midwest providing reliable power and managing voltage properly



					Mean	N	
Voltage on the system is managed appropriately by ITC Midwest	2024	14%	50%	33%	4.14	42	
	2021	6%	61%	29%	4.09	46	
ITC Midwest promptly addresses power quality issues	2024	15%	54%	29%	4.10	41	
	2021	7%	63%	26%	3.91	44	
ITC Midwest provides reliable power to its customers	2024	5%	12%	57%	26%	4.00	42
	2021	20%	59%	18%	4.12	49	

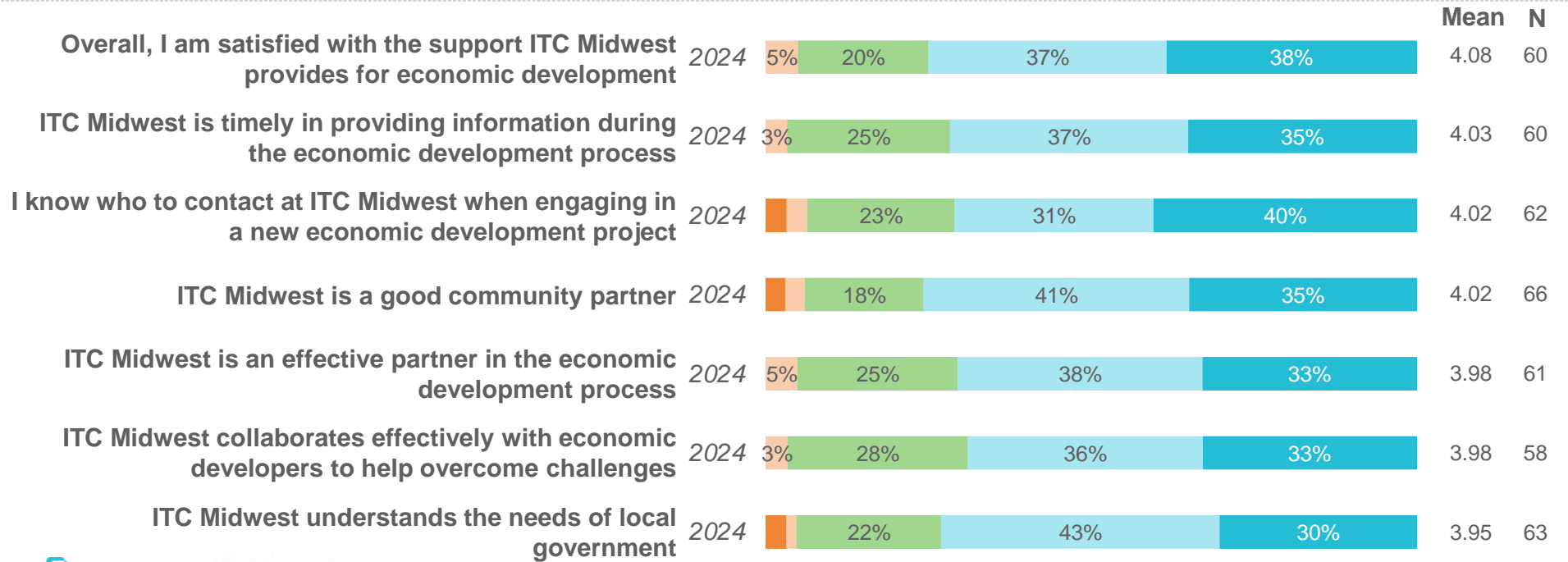
Strongly Disagree Disagree Neutral Agree Strongly Agree

# Economic Development and Growth Opportunity Summary



## New Section for 2024

A series of questions were added this year regarding ITC Midwest's role as a **partner to communities and local governments**, specifically during **economic development**

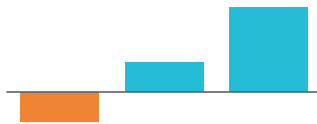


Strongly Disagree Disagree Neutral Agree Strongly Agree



# Overall Satisfaction Summary

2 out of 3 questions in this section had **increases** of 0.1 or more from 2021



**Four new questions** were added this year to further gauge ITC Midwest's quality of service, perceived value, community impact, and stakeholder experience

					Mean	N
ITC Midwest is a quality transmission system provider	2024	4% 11%	51%	32%	4.09	74
	2021	10%	59%	31%	4.20	49
I am satisfied with the value of ITC Midwest transmission services	2024	8% 16%	43%	30%	3.89	74
	2021	6% 20%	55%	16%	3.78	49
Over the last few years, ITC Midwest's value to my organization has increased	2024	5% 24%	37%	30%	3.82	74
	2021	4% 46%	38%	10%	3.50	48
ITC Midwest consistently delivers high-quality service	2024	5% 11%	53%	31%	4.09	75
ITC Midwest clearly communicates its company values to stakeholders.	2024	4% 16%	54%	26%	4.01	74
Overall, ITC Midwest has a positive impact on its customers and surrounding communities	2024	4% 23%	37%	33%	3.93	75
ITC Midwest is proactive in making changes that improve the stakeholder experience.	2024	6% 25%	43%	26%	3.86	73

Strongly Disagree Disagree Neutral Agree Strongly Agree





# QUESTIONS





# Break



# Topology Optimization

ITC Midwest Partners In Business Meeting  
October 8, 2024



# Overview

**Purpose:** Provide an overview of topology optimization efforts which Alliant Energy and ITC have been collaborating on that have led to greater system utilization, cost savings for IPL customers and other benefits.



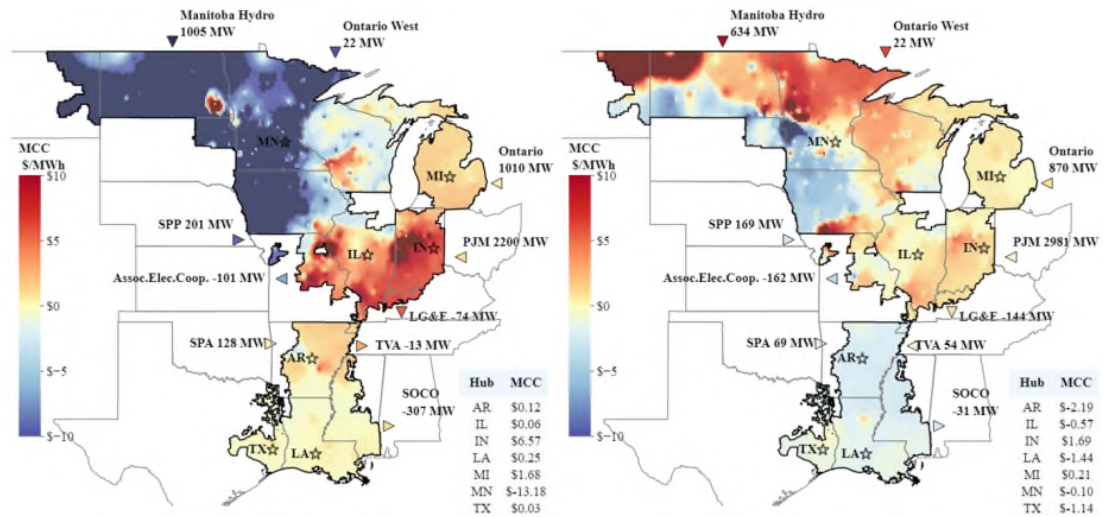
## Key Takeaways:

- Working together Alliant Energy and ITC have been able to consistently identify and deploy solutions that benefits customers, with support from NewGrid.
- Solutions implemented have provided an estimated \$28 million of cost benefit to IPL customers over the past 3 years.
- MISO has established a formal process to consider reconfiguration solutions and stakeholders are working to further refine this process.

# Issue

- Transmission congestion impacts generating facilities and load; lowering energy market revenues and PTC benefits and increasing costs.
- Transmission reinforcements and expansion is a long-term solution; but there is also a need for near-term efforts to optimize the current transmission system and consider alternatives.

Average Real-Time Congestion Components in MISO's LMPs  
2022 2023



An “*all of the above*” approach is needed to address congestion which includes better utilization of the existing transmission system

# Transmission Reconfigurations - Background

- **Switching circuit breakers open or closed**
  - Analogous to temporarily diverting traffic away from congested roads to make traffic smoother
- **Currently used for reliability reasons**
  - MISO has procedures in place (e.g., operating guides) to reconfigure the grid as needed to maintain reliability

**Not a new concept -  
Reconfigurations  
are happening  
everyday across  
MISO**

# Optimization Effort



Analyze current congestion events affecting Alliant Energy generation assets and demand



Identify upcoming events with potentially high congestion impact



Develop reconfiguration solutions to mitigate the impacts of those events



Work with transmission owners and MISO to implement

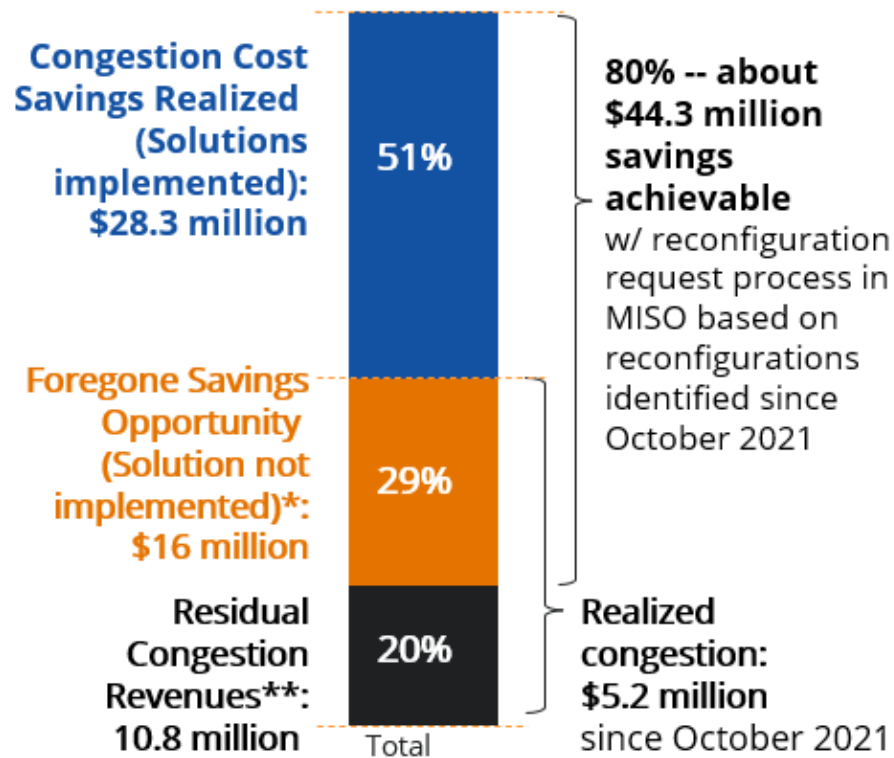
Optimization effort has been a joint effort between Alliant Energy, NewGrid, ITC, MISO and other transmission and generation owners.



# Optimization Effort Continued.....

- NewGrid software and expertise utilized to anticipate congestion events affecting Alliant Energy generation assets and demand and then find solutions.
- Perform contingency and reliability analysis
  - Determine if solution can relieve congestion while respecting system security limits such as N-1 contingency criteria and voltage limits
  - Either no load radialized or limited to a minimum
- Work with ITC, MISO and potentially other transmission owners to implement
- Overall looking for low hanging fruit (avoid complex solutions)

# Results - IPL Savings



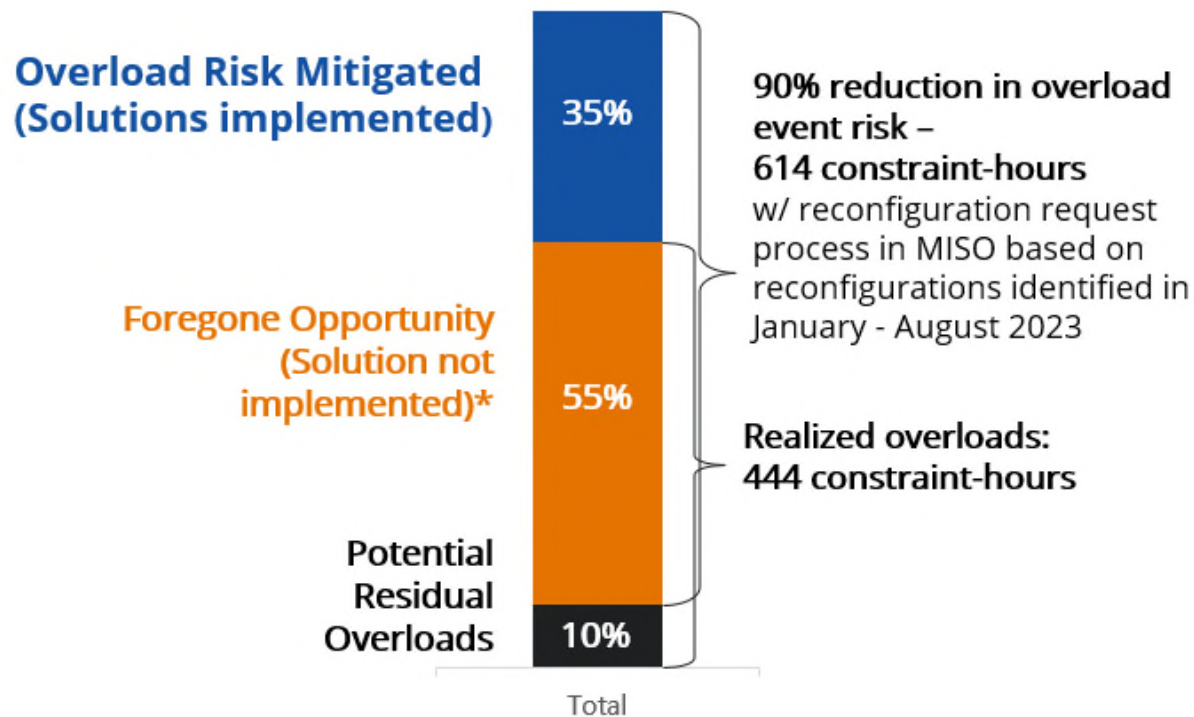
The impacts were calculated ex-post based on analyses of state estimator cases published by MISO and of historical market data. The total chart shows the cumulative costs for all months since the effort started in October 2021.

\* Solution not implemented includes the impacts of all solutions found, requested and that were not declined on a technical basis, as well as solutions not requested due to the lack of an established request process.

\*\* Residual congestion may be reduced further, as not all significant constraints affecting Alliant were analyzed during the pilot due to scope of work.



# Results - Reliability Benefits

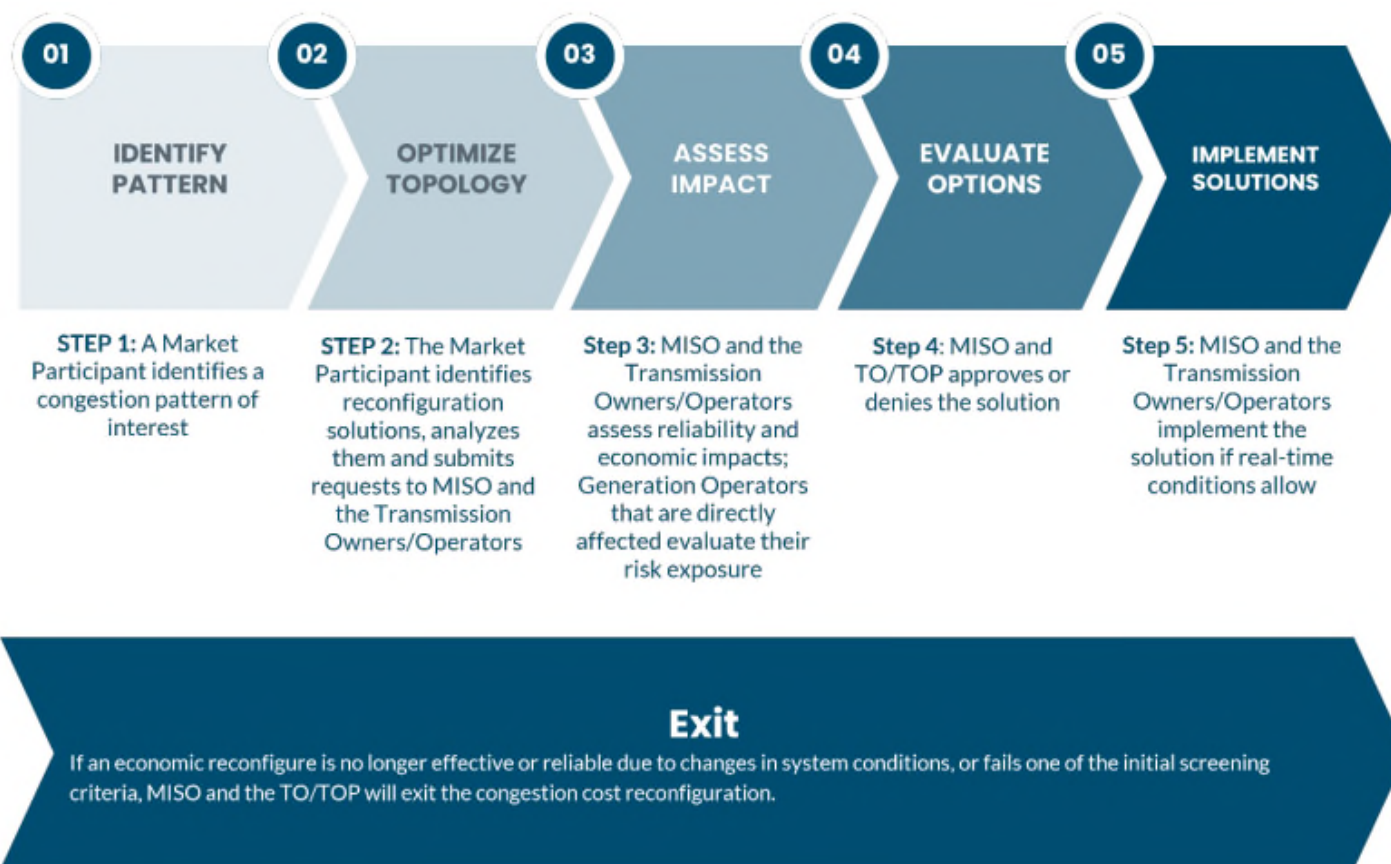


Reliability impacts calculated ex-post based on analyses of MISO state estimator (SE) cases. The number of constraint-hours with overloads is estimated as 6 times the number of constraints in SE cases with flow over 100% of their facility rating (without redispatch), where the number 6 is used because only 4 SE cases are made available to market participants by MISO per day (one SE case about every 6 hours). Only constraints analyzed in the pilot for Alliant Energy were included in this analysis – overloads on other constraints are not included.

\* Solution not implemented includes the impacts of all solutions found and submitted to MISO that were not declined on a technical basis.



# MISO Reconfiguration Request Process



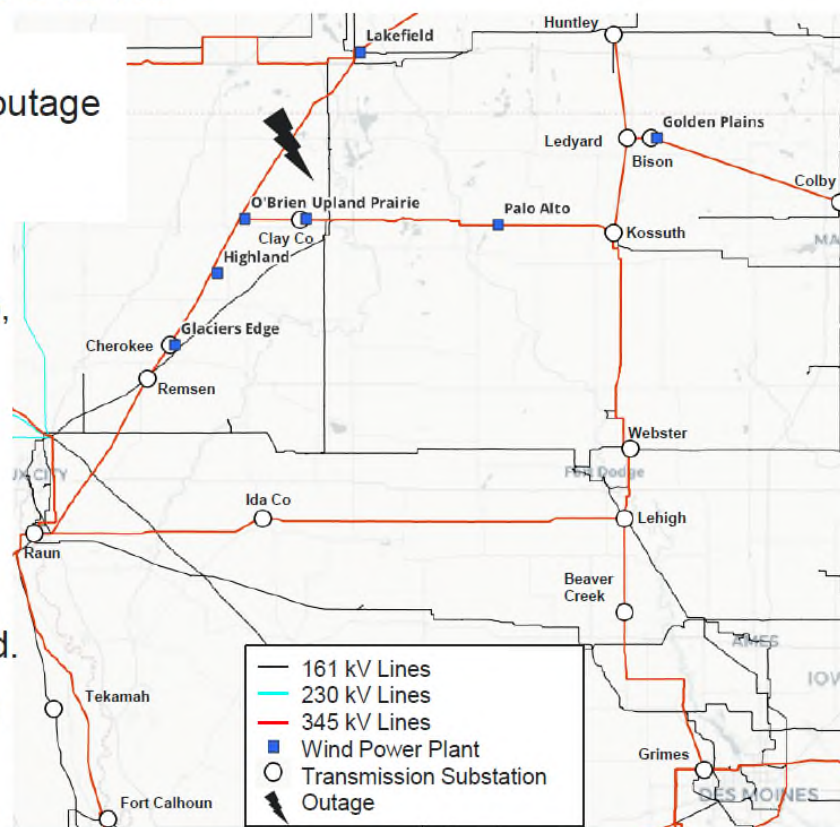
# Appendix

## Reconfiguration Example

# Outage of Lakefield – O'Brien 345 kV

## OUTAGE OF LAKEFIELD – O'BRIEN 345 KV

- Lakefield – O'Brien 345 kV was on planned outage on 11/06/23 – 11/30/23 (ticket 1-26927171).
- The outage increased congestion on:
  - Raun – Remsen flo Kossuth – Palo Alto,
  - Raun – Remsen flo Clay County – Palo Alto,
  - Raun – Tekamah flo Fort Calhoun – Raun,
  - Fort Calhoun – Raun flo Beaver Creek – Grimes.
- NewGrid anticipated that the outage would cause congestion, and developed a reconfiguration to mitigate the Raun – Remsen constraints, which was implemented.
- This presentation summarizes the event and the savings provided by the reconfiguration.



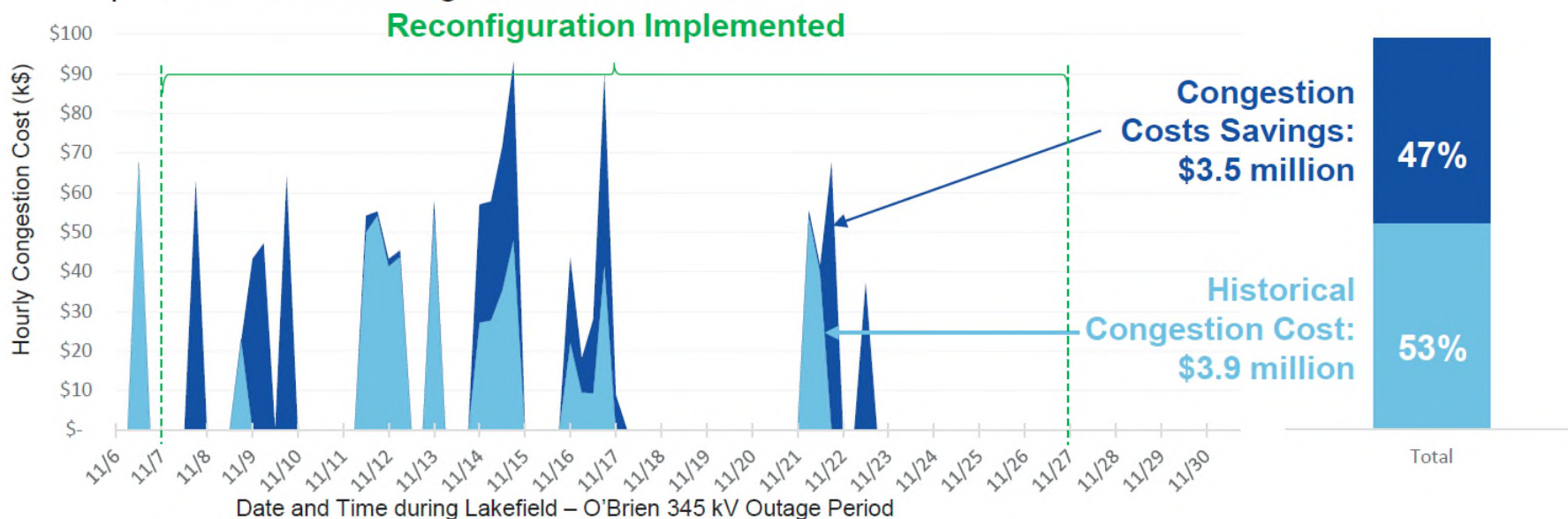
Map Sources: NewGrid analysis and [Homeland Infrastructure Foundation-Level Data](#).

# Proposed Reconfiguration Solution

- NewGrid developed a reconfiguration to relieve congestion on Raun – Remsen 345 kV flow  
Kossuth – Palo Alto 345 kV:
  - Action: **Open Palo Alto 345 kV ring bus** such that a fault on the Kossuth – Palo Alto 345 kV line would also disconnect Clay County – Palo Alto 345 kV and the Palo Alto plant.
  - Because the Palo Alto plant is part of the contingency with the reconfiguration:
    - The Palo Alto plant's contribution to the constraint flow is 0, and is thus fully insulated from congestion on this constraint.
    - The total constraint flow decreases, relieving congestion for all other area plants as well.
- The reconfiguration was submitted to MISO on 10/11/23, it was approved and scheduled with the driver outage start/end dates (11/06-11/30), posted in OASIS.
- Ex-post analysis indicates that the reconfiguration was in place between 11/07 and 11/26.
- We estimated the ex-post cost savings and avoided curtailments provided by the reconfiguration using the 100 State Estimator (SE) system snapshot cases published by MISO for the outage period (see methodology in the Appendix).

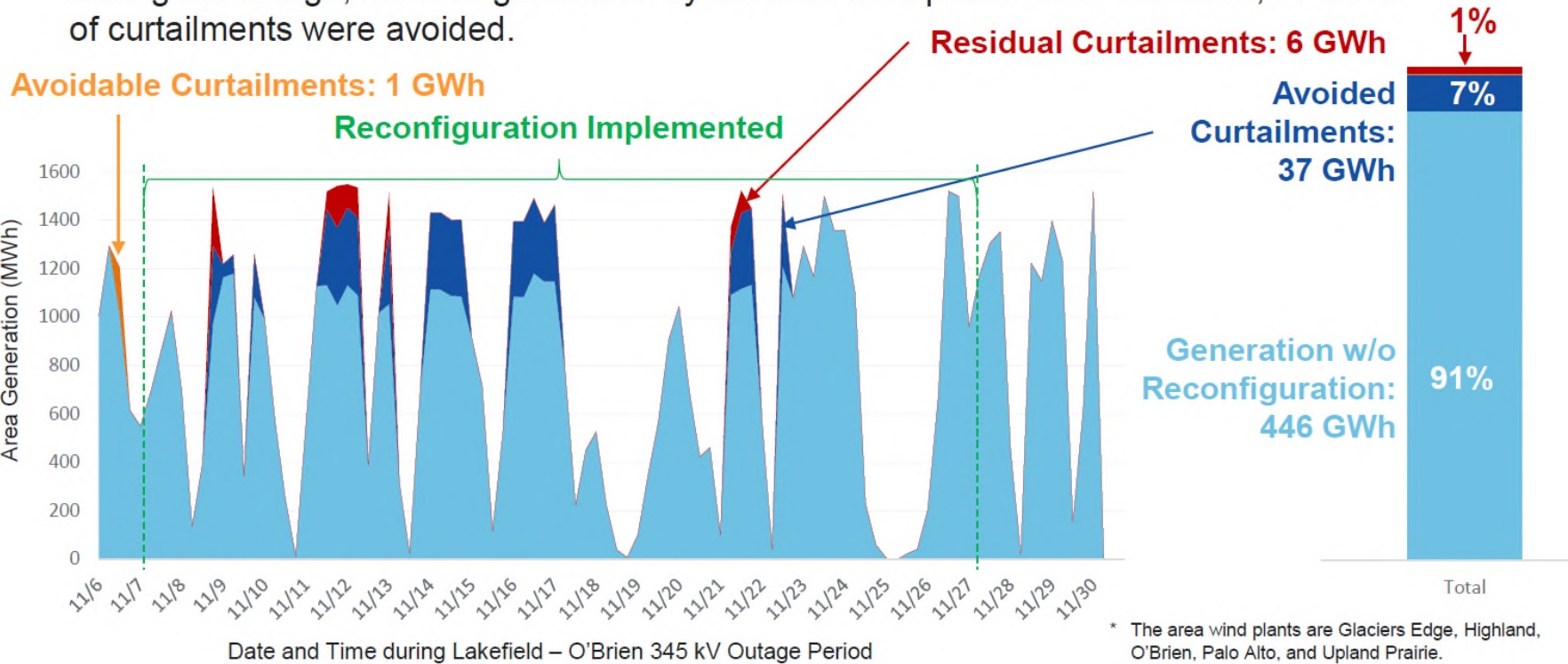
# Regional Congestion Cost Savings

- During the outage, congestion costs for Raun – Remsen totaled **\$3.9 million**.
- While the reconfiguration was in place (11/07-11/26), it provided **\$3.5 million** of regional congestion savings (without it, congestion cost would have been **\$7.4 million**). The associated production cost savings were \$1.1 million.



# Regional Avoided Curtailments

- During the outage, the total generation by the area wind plants\* was 483 GWh; 37 GWh of curtailments were avoided.



# Topology Optimization



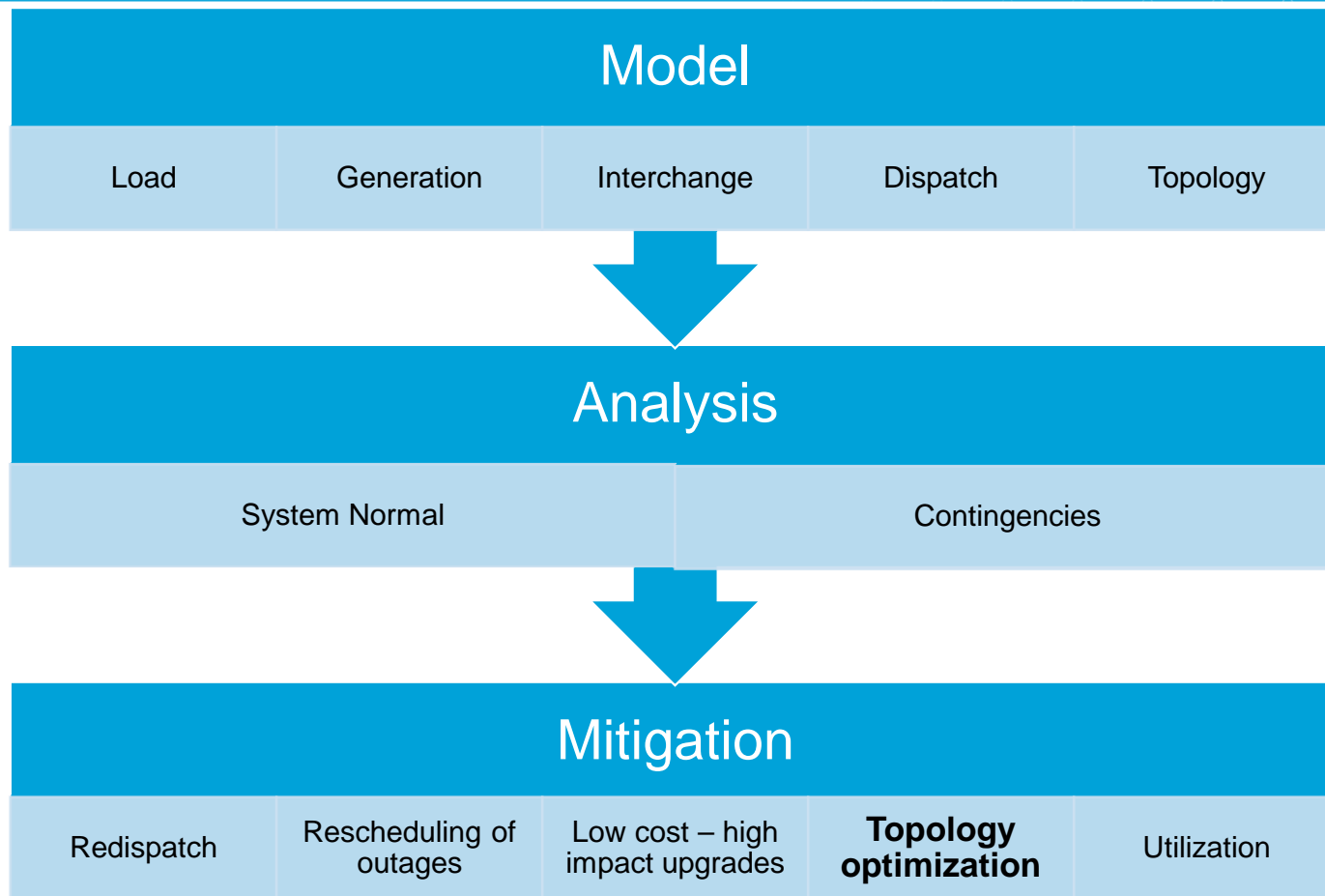
**Abubaker Elteriefi**

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*[aelteriefi@itctransco.com](mailto:aelteriefi@itctransco.com)*



**FOR THE GREATER GRID**

# Process Overview



# Mitigation Options

	Cost	Coordination	Flexibility	Network Strength
Outage Reschedule	★★★	★★	★★	★★★★★
Generation Redispatch	★★	★★★★	★★★★	★★★★★
Topology Optimization	★★★★★	★★★★	★★★★	★★★★
Low-cost Upgrades	★★★★	★★★★	★★★★	★★★★★
Transmission Utilization	★★★★★	★★	★★★★	★★★★★

# Topology Optimization Types

## Station Configuration

- Low impact to network connectivity
- Could be used in place of complicated remedial action schemes
- Could be restored at any time
- May impact load or generation connected at the station

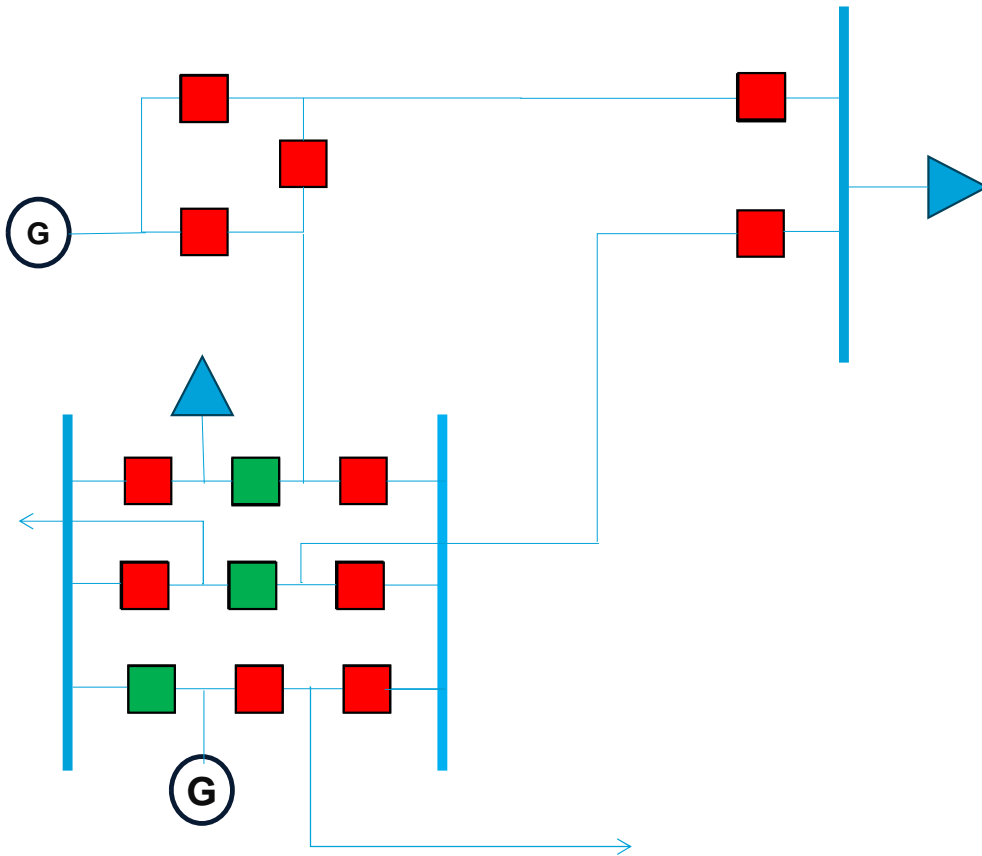
## Facility Disconnection

- Disconnect lower rated facilities to reroute power to high-capacity ones
- May put load on radial
- Some impact to network strength
- Prefer to use SCADA controlled facilities

## Station Splits

- More complicated and requires more careful review
- Typically requires relay coordination review
- May impact load or generation connected at the station
- Successful applications have shown to be very effective

# Topology Optimization Considerations

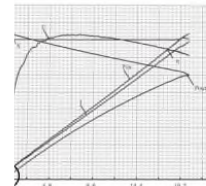


Generation  
Impact

Load Impact



Relay  
Coordination



Problem  
Shifting



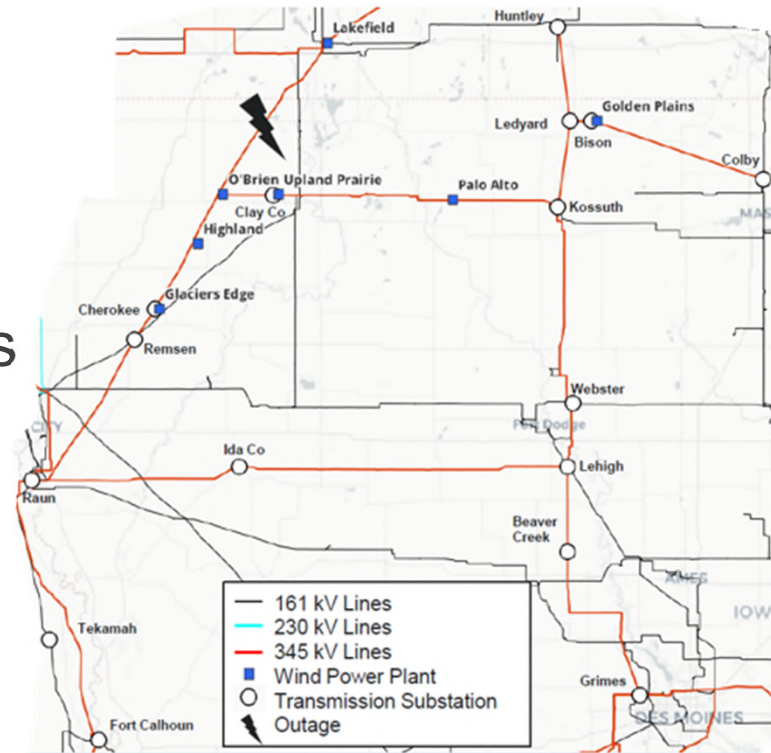
# Topology Optimization Example – Ottumwa

- Outage of Ottumwa Generation Station
- Increased congestion on
  - Beacon Irvine 161 kV line ( AAR)
  - Poweshiek Reasnor 161 kV (AAR)
- Multiple Configuration Options were used by ITC and MEC
- Savings of over \$4.4M



# Topology Optimization Example – Lakefield O’Brien

- Outage of Lakefield O’Brien 345 kV
- Increased congestion on
  - Raun Rensen 161 kV
  - Raun Tekamah 161 kV
- Open Palo MEC Alto 345 kV ring bus
- Savings of over \$3.5M





Questions?



**Abubaker Elteriefi**

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**FOR THE GREATER GRID**

# ITCMW Operations Update – Reliability



**Rodolfo Lozano**

*Sr. Engineer, Operational Planning*  
*rlozano@itctransco.com*



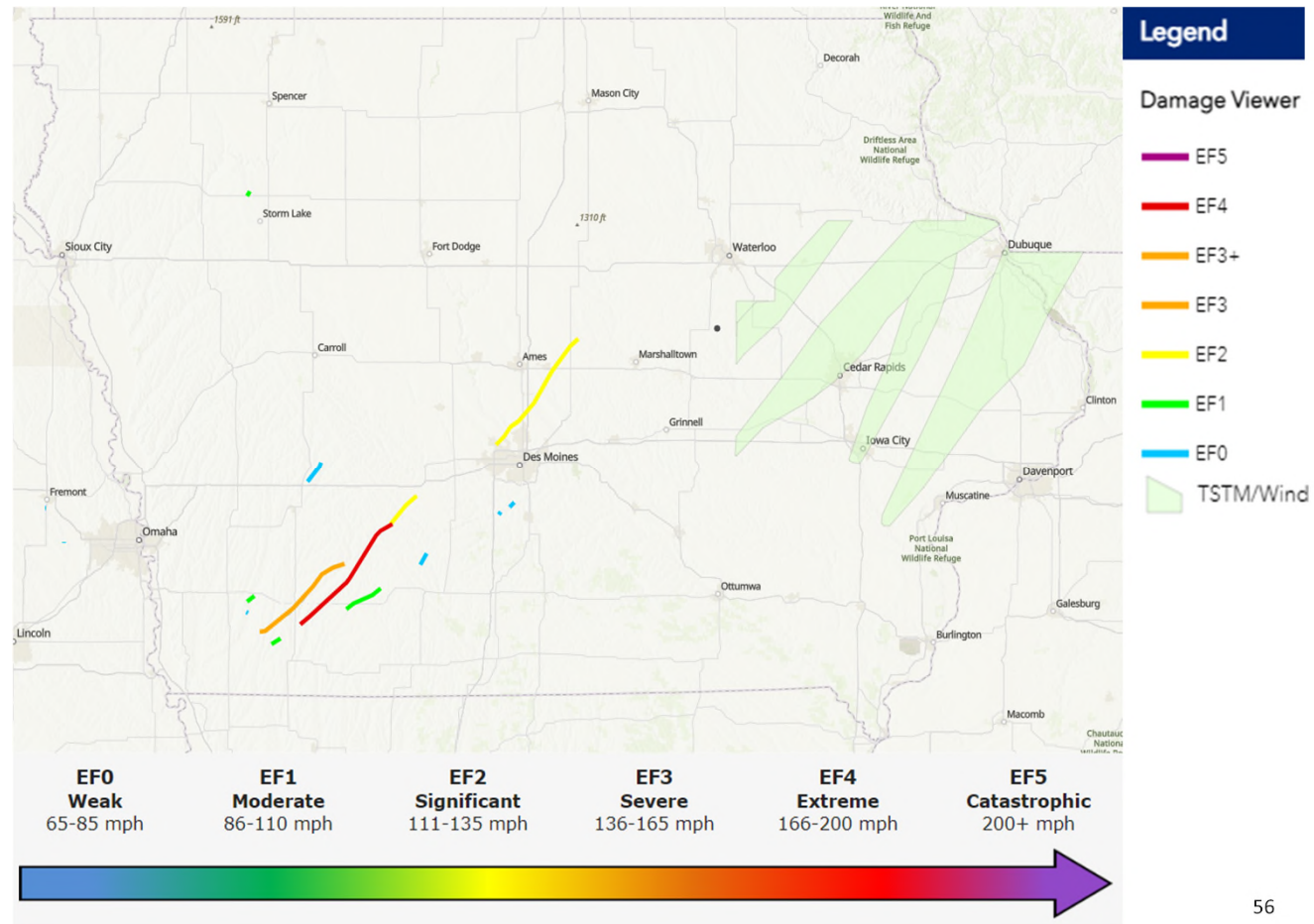
**FOR THE GREATER GRID**

- 
- Major Storm Performance
  - 2023 Reliability Performance
  - Performance Drivers
  - Historical Outage Improvement

# ITCM Major Storm Performance

## Storm Event Summary May 21<sup>st</sup>, 2024

- 9 tornados impacted Iowa
  - Most occurred in southwest
  - Majority of tornados were EF2 and below
  - One reported EF4 tornado, Page to Adair County, est. peak wind of 185 mph
- Multiple thunderstorms with damaging winds in the east.



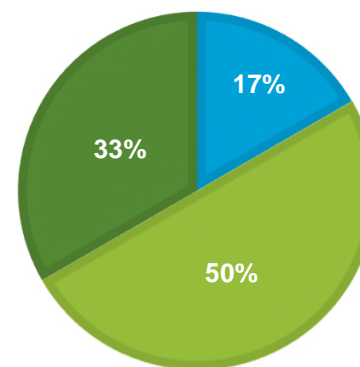
# ITCM Major Storm Performance

System Performance on May 21<sup>st</sup>, 2024:

- Most of the operations occurred on the 69kV and below
- Sustained operations accounted for 43% of the total operations.
- 3 sustained outages on 69kV from tornado damage.
- 10 sustained outages impacted customers:
  - 8 outages with avg. return time of 142 minutes
  - 2 outages with avg. return time of under 2 days (tornado contact, 24 total structures down)

**TOTAL OPERATIONS**

■ 100 kV ■ 69 kV ■ 34.5 kV



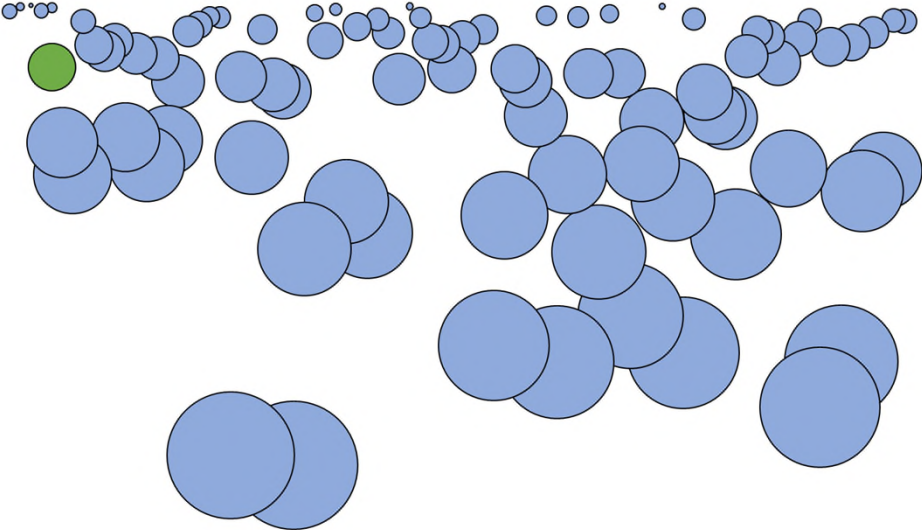
Voltage Class	Sustained Operations	Momentary Operations	Total Operations
100 kV	2	3	5
69 kV	6	9	15
34.5 kV	5	5	10

# Reliability Benchmarking Above 100 kV

ITC benchmarks performance against a broad peer group

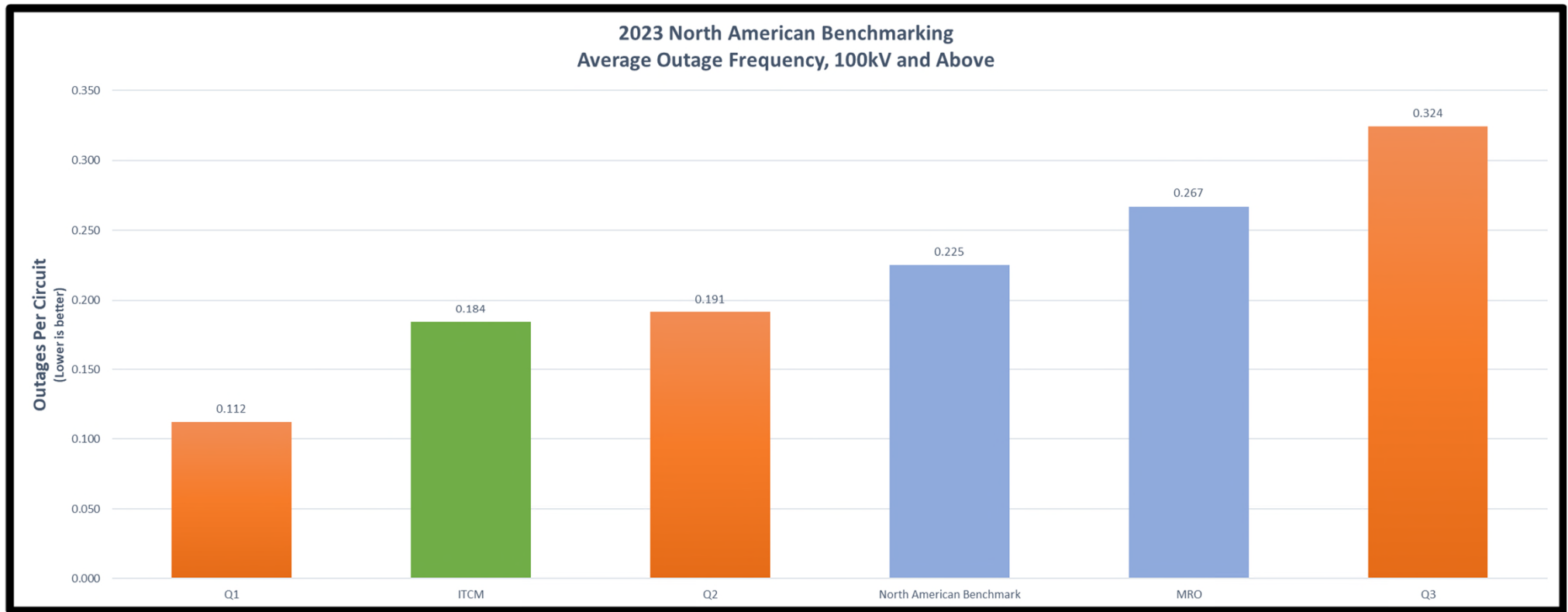
Targets top quartile performance for each of our operating companies

2023 Benchmarking Group **above 100 kV** included **86 companies**

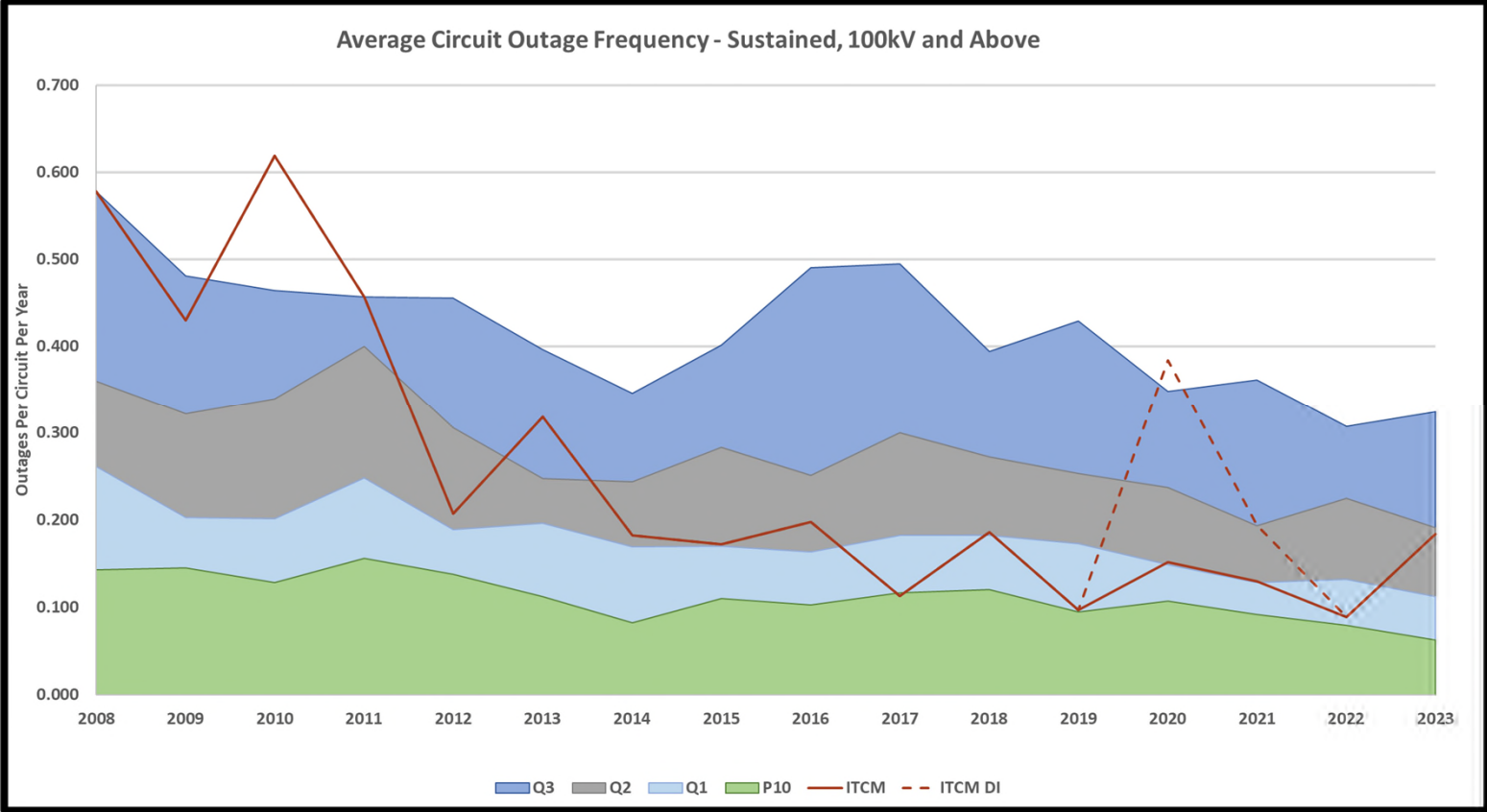


	ITC Midwest	Total Peer Group
Number of Circuits	158	21,249
Circuit Miles Above 100 kV	~2,600	~360,100

# Reliability Performance - Benchmarking



# Reliability Performance - Benchmarking Trend

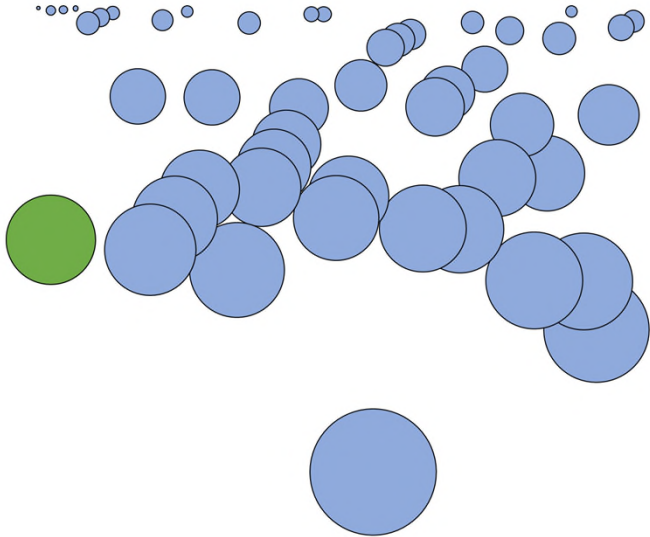


# Reliability Benchmarking Below 100 kV

ITC benchmarks performance against a broad peer group

Targets top quartile performance for each of our operating companies

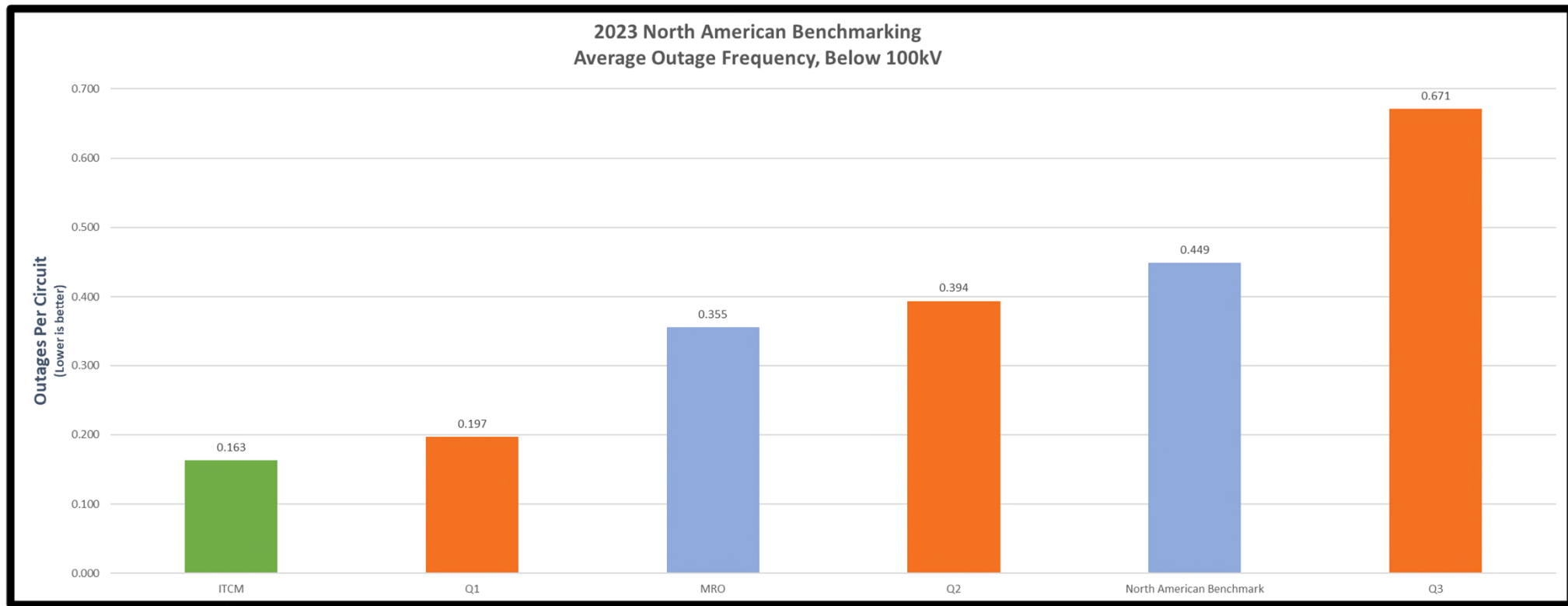
2023 Benchmarking Group **below 100 kV** included **52 companies**



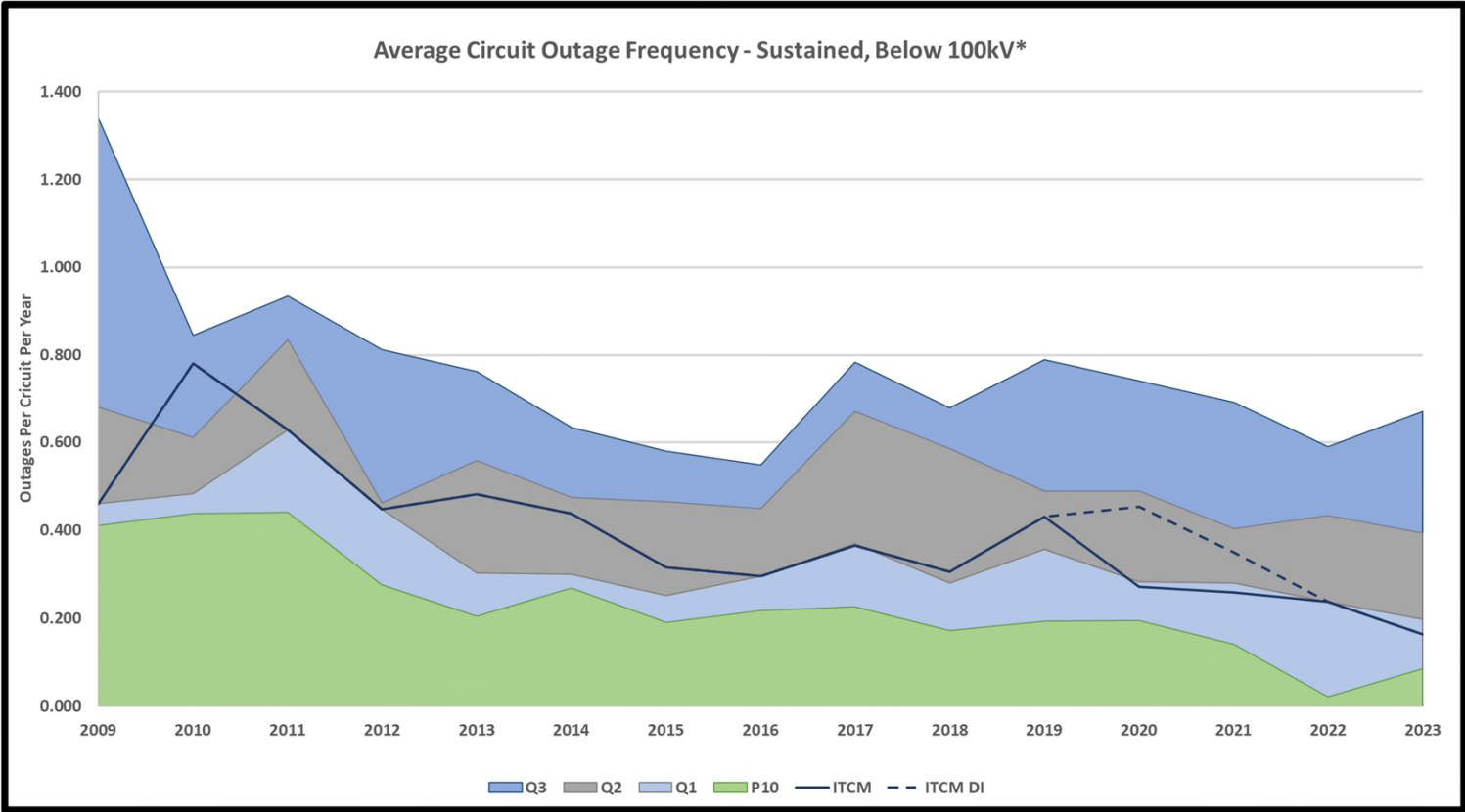
	ITC Midwest	Total Peer Group
Number of Circuits	263	6,295
Circuit Miles Below 100 kV	~3,400	~73,400
34.5 kV Circuit Miles	~950	--

\*Below 100 kV benchmarking does not include the 34.5 kV system

# Reliability Performance - Benchmarking



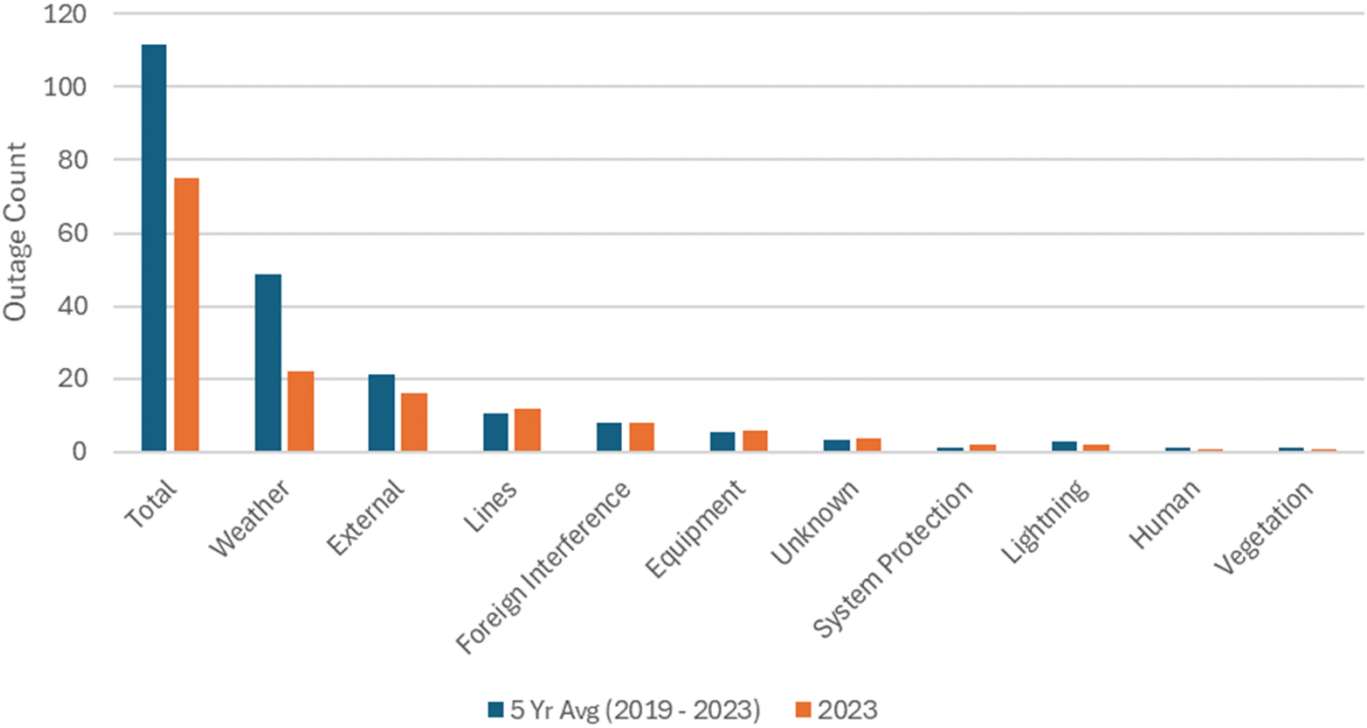
# Reliability Performance - Benchmarking Trend



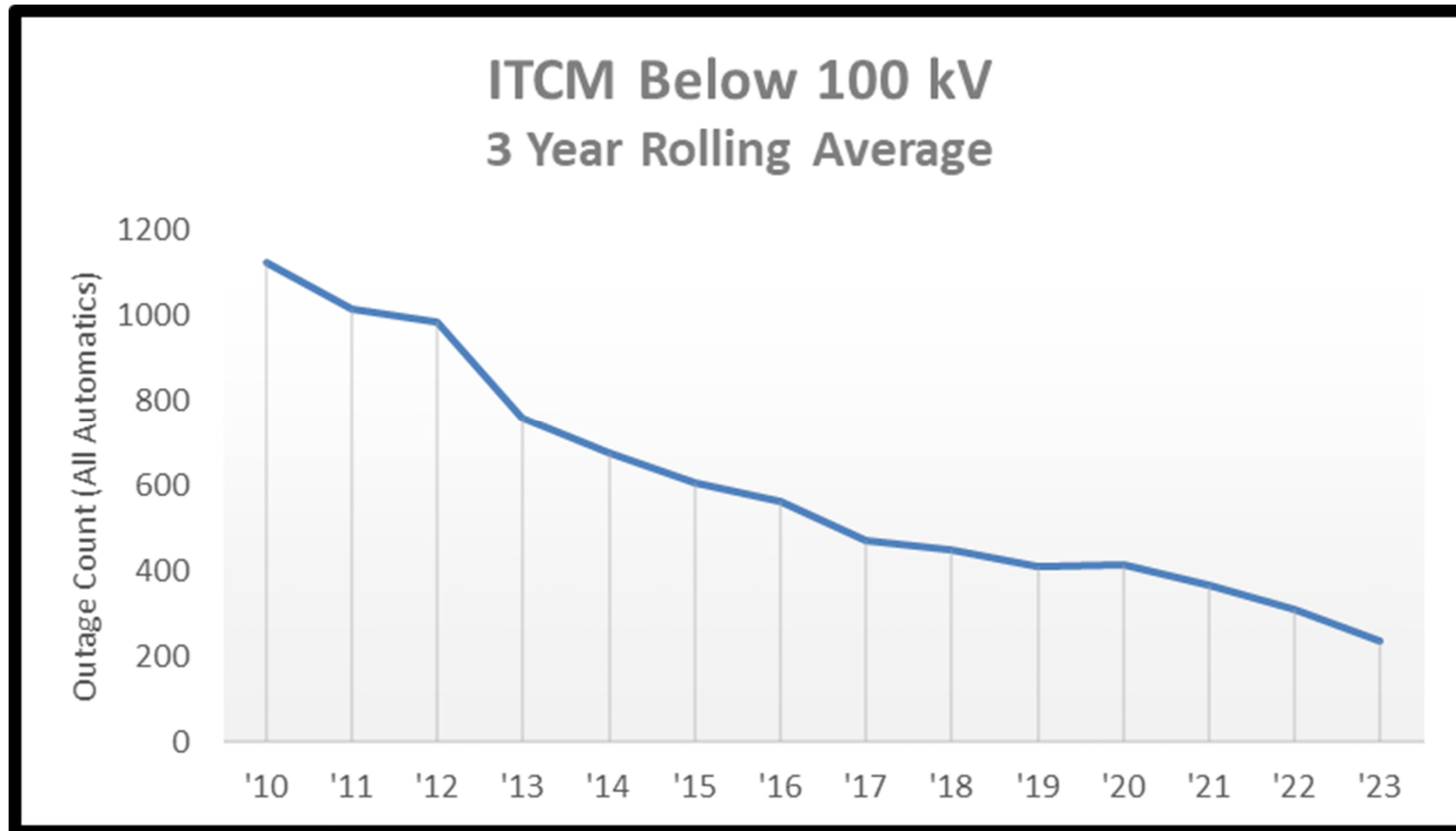
\*Below 100 kV benchmarking does not include the 34.5 kV system

# Reliability Performance Drivers

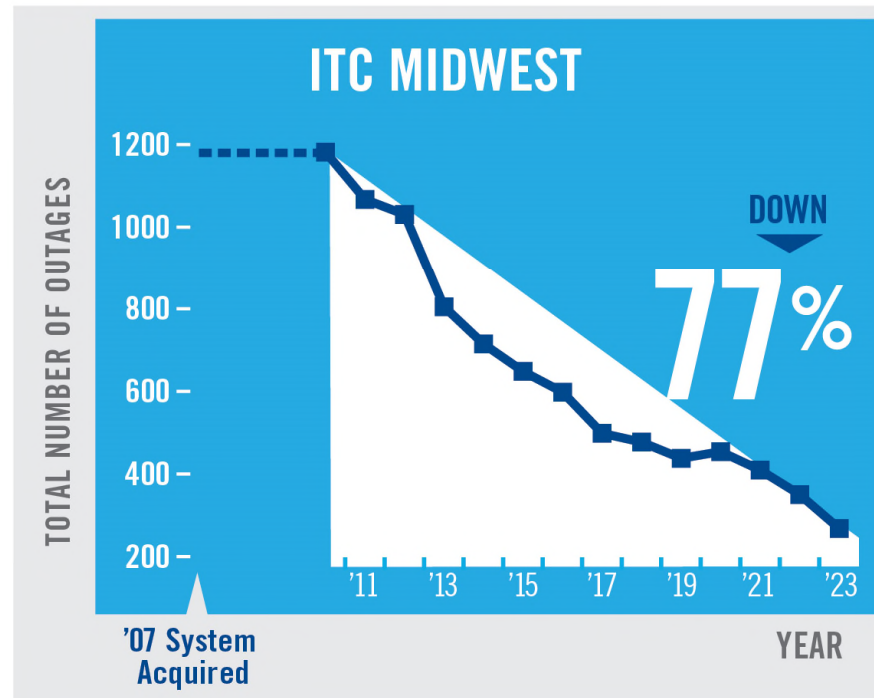
ITCM Sustained Outage Cause - 2023



# Historical Outage Improvement



## OUTAGE DECREASE UNDER ITC OWNERSHIP 3-year rolling averages



Questions?



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# Lunch in Atrium

# Economic Development



**Cheri Monahan**

*Director, Customer & Business Solutions*  
*[cmonahan@itctransco.com](mailto:cmonahan@itctransco.com)*



**FOR THE GREATER GRID**

# Topics



- Data center trends
- Manufacturing & Hydrogen
- Site readiness
- Midwest Advantages
- ITC Midwest Preparation

# Data Center Growth

- Unprecedented growth potential
- How long will this last?
- How can we help attract?



# THE DIGITAL ECONOMY DEMANDS HYPERSCALE

Data centers have become critical to America's economic growth by powering businesses and enabling innovation

INNOVATION	DESCRIPTION	DATA REQUIREMENTS	DATA CENTER TYPE/S
AI/ML	Augment and automate jobs, solve complex tasks and enable new data-driven business models.	Train models with large sets of data; data inference for end-user interactions.	Hyperscale
Cloud	IaaS, PaaS, and SaaS to support migration of enterprise IT to off-prem and optimize operational costs.	Servers, or virtualized server machines, to host IT environments, applications and data storage.	Hyperscale
AR/VR	Creating new, or layers of, digital environments to share information, manipulate, and interact with other users.	High-resolution graphics and videos, layered on physical environment or 3D models for real-time interactions.	Hyperscale
IoT	Sensors used for automate industrial, manufacturing, autonomous vehicles, smart cities, utility operations.	Manage and communicate data generated by edge devices, supporting real-time processing and storage.	Edge
Content Streaming	Social media, gaming, video streaming, mobile applications delivered to end user devices.	Caching content closer to end users to improve load times and user experience for websites and applications	Hyperscale, Enterprise, Edge
Big Data Analytics	Finance, biotech, aggrotech, retail - need insights from large datasets to drive decision-making and innovation.	Requires the storage and processing of vast amounts of data for analytics.	Hyperscale, Enterprise
Crypto Mining	Solve complex algorithms that validate transactions and secure blockchain networks.	Computation power data storage for verifying and maintaining blockchain ledgers.	Enterprise, Colocation

Most digital use cases require (or benefit) from the development of Hyperscales to enable more data storage and dense processing power

# TWO PRIMARY SEGMENTS OF DEVELOPERS

Speed to market is critical to innovation & competitive positioning in today's Digital Economy.

Build & operate a data center to meet operational needs.\*

Build & operate a data center to deliver products & services.



USER-OWNERS

Only a **handful** can afford the race...\*

Ops & Product Focused

- Innovation 
- Scalability

Build a data center to lease for enterprise operations

Build a data center to scale operations across multiple tenants (colocation)

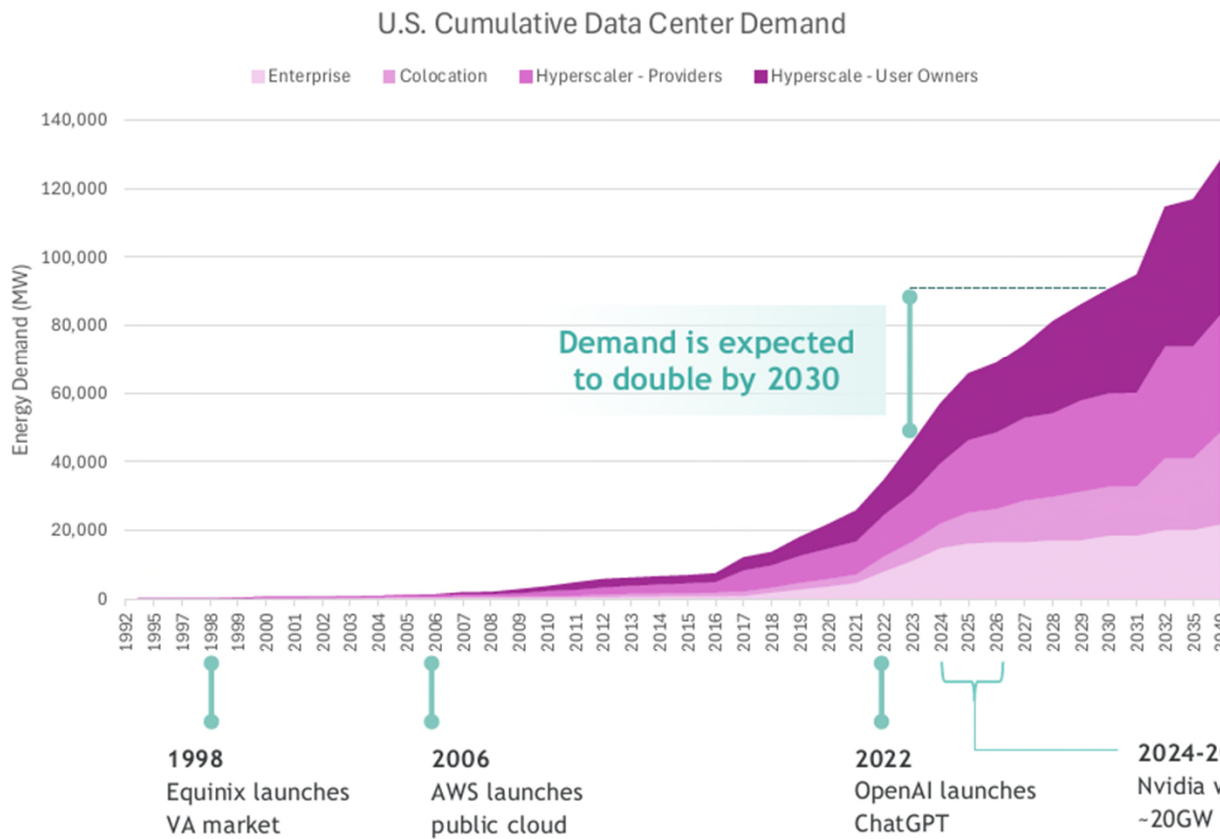


PROVIDERS

Tenant Focused

- Footprint
- Lease-ability

# PLANNED CAPACITY WILL MORE THAN DOUBLE



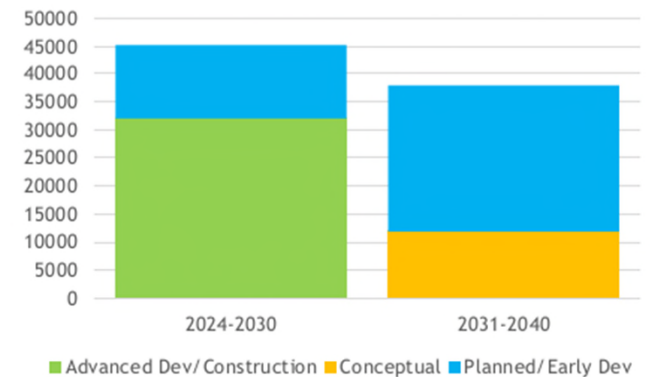
61%

of known pipeline is Hyperscale

40%

of known pipeline is underway

Planned Project Status (2024-2040)



Source: 1898 & Co. compiled dataset as of July 2024

# Manufacturing & Hydrogen Opportunities

- Mid-size manufacturing will pick back up after the election
  - OEM
  - Food & Ingredient processing
  - Environmentally controlled agriculture
  - Bioscience innovations
  - Ed-Tech
- Green hydrogen
  - Sustainable Airline Fuel
  - Iowa considering incentives



# Site Development

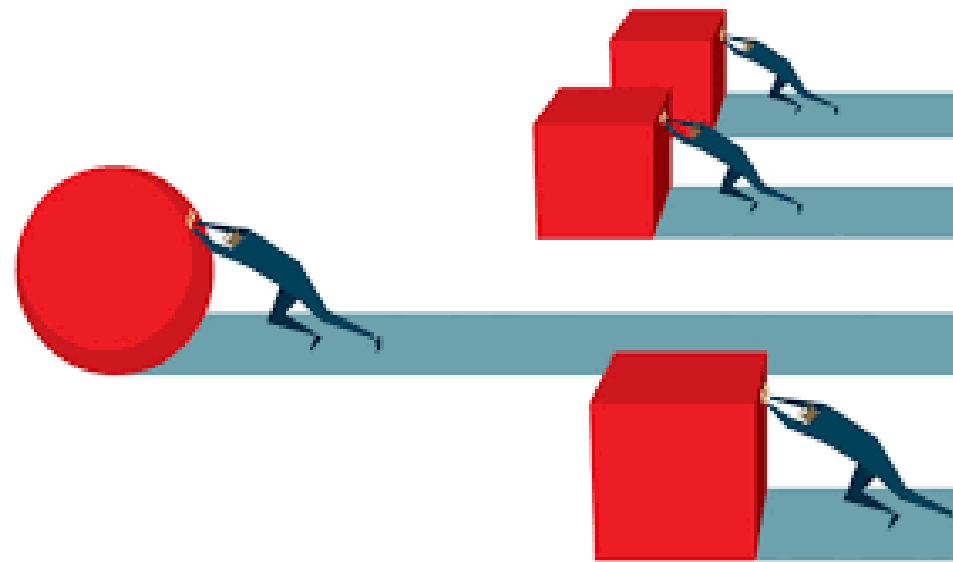
- Low supply of ready sites
- Unprecedented site selection activity across the US
- Inconsistent certification/shovel ready/site programs
- Growing NIMBY
- \$450 Registration Fee + Application Fee \$3000-\$6000
  - Minimum 5 acre site



[REDI Sites - Site Selectors Guild](#)

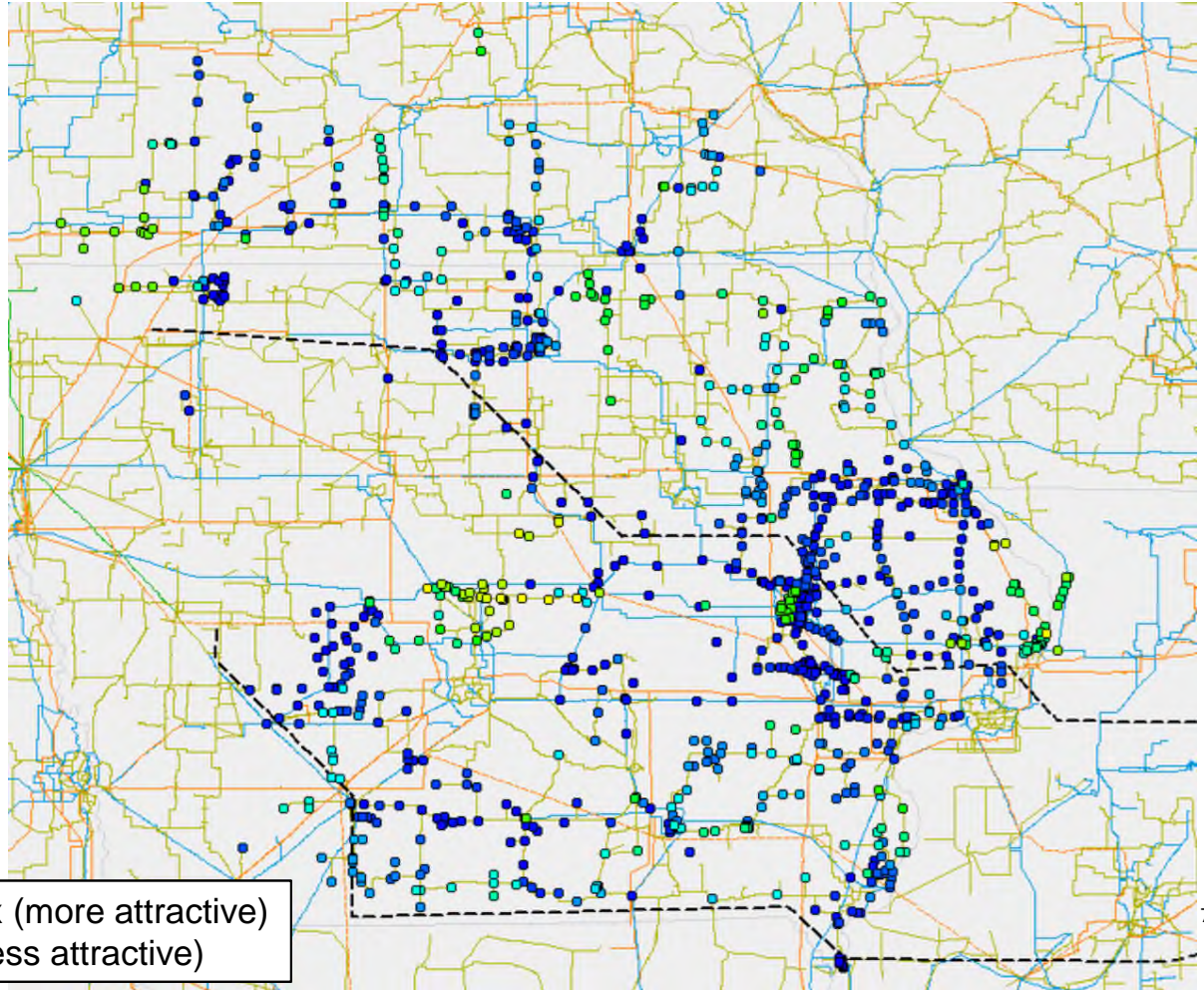
# Competitive Advantage

- Transmission planning procedures
  - MISO
    - Proactive planning (MVP, LRTP)
    - EPR process
  - No charge
- Access to renewables
- Midwest work ethic & cost of labor
  - IT Professionals in MW vs. East or West Coast
- Cooler climates can reduce cooling energy costs up to 30%
- Average land cost vs. coastal regions

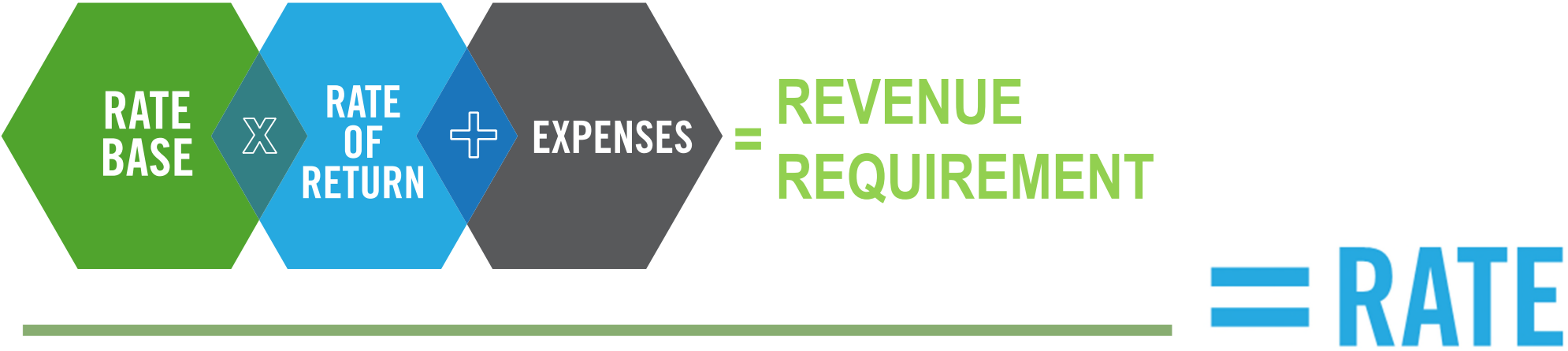


# Heat Map

- High-level view of relatively more and less attractive area to site load on the ITC Midwest transmission system
- Overview methodology
- Annual updates planned
- Full presentation in appendix



# Economic Development is Important to ITC



**LOAD** ... **DENOMINATOR ISSUE**



# Questions?



**Cheri Monahan**

*Director, Customer & Business Solutions*  
*[cmonahan@itctransco.com](mailto:cmonahan@itctransco.com)*



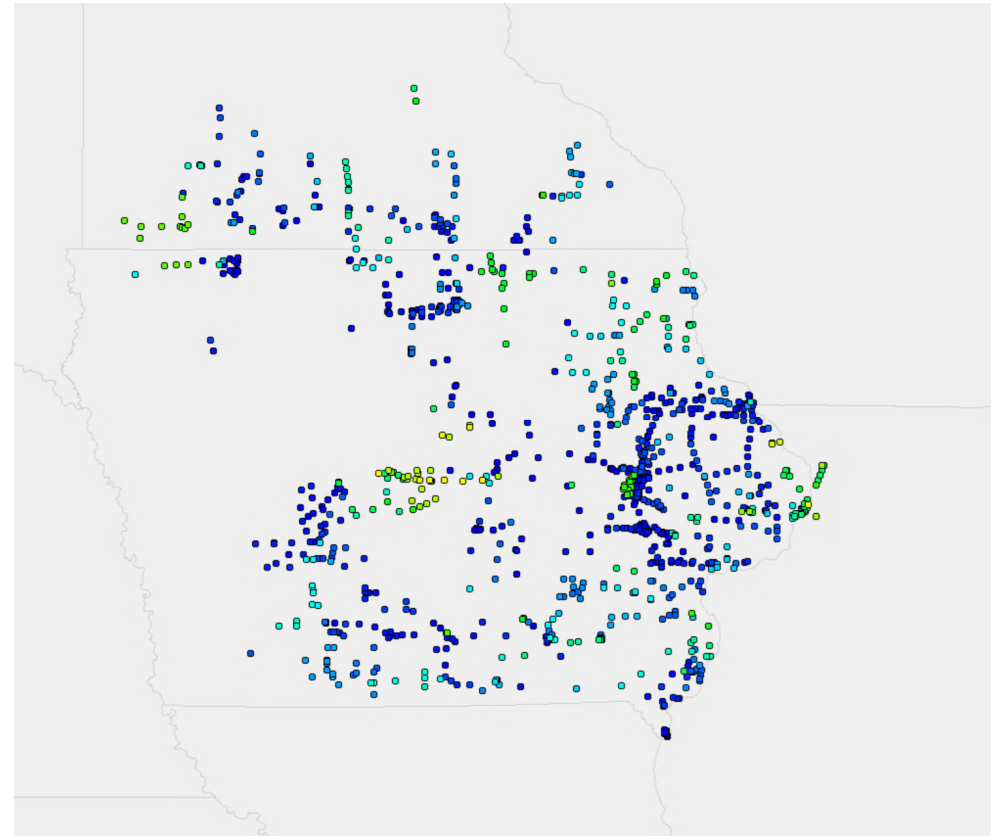
# Appendix: ITC Midwest Load Map



**FOR THE GREATER GRID**

# Agenda

- Purpose
- Disclaimer
- Study Methodology
- Examples
- ITC Midwest Load Map
- Next Steps
- Feedback/Questions



# Purpose

## Purpose

A high-level view of relatively more and less attractive areas (from a transmission system perspective) to site load on ITC Midwest transmission system

- Analysis utilizes a process that considers load capacity and estimated cost factors
- Substations are given an index (“golf score”: lower index is better)
  - Ability to site relatively higher capacity loads with lower costs = lower index (more suitable area to site load)
  - Areas restricted to lower capacity loads with higher costs = higher index (less suitable area to site load)

## Disclaimer

The Interconnection Overview is not meant to and does not:

- Quantify the load capacity in any given area of ITC Midwest transmission system
- Determine actual costs associated with load interconnections
- Replace/represent a comprehensive impact study (note: voltage analyses is excluded from this study)
- Determine final feasibility of siting load at specific locations

# Methodology

## Study Methodology

### FCITC Analysis<sup>1</sup>

- This is a more simplistic analysis than ITC Midwest typically performs for load interconnection requests
- Created a hypothetical 1,000 MW load at each transmission station/system bus
- ITC Midwest required BES and non-BES contingencies were considered<sup>2</sup>
- Transfer capacity and limiting facilities were identified at each station within the total transfer level

### Two factors were considered for each station:

- Transfer Factor – load limit
- Cost Factor – Based on the limiting facility's line mileage (length of transmission that is assumed would need to be rebuilt) and voltage class

### These two factors were used to generate a Total Index for each limiting facility

- Product of the Transfer Factor and Cost Factor
- The weight is skewed in favor of the Transfer Factor

<sup>1</sup>First Contingency Incremental Transfer Capability

<sup>2</sup>This includes Generator, Line, Capacitor, Transformer, Double Circuit Tower, Single Point Failure, and Bus/Breaker Fault/Fail contingencies (NERC Category P1, P2, P4, P5, P6, P7)

*This information is high-level, indicative, and subject to change. For more information, please contact your load serving entity who will work with ITC.*

# Methodology (Cont.)

## Study Methodology

- Total Sum Index
  - Derived by summing each total index associated with each station
  - Total Sum Index for each substation is mapped using Velocity Suite Application<sup>1</sup>
- Study Input Assumptions
  - The study was performed on a 2-year out summer peak model
    - Considers planned upgrades within that 2 year out horizon
    - Only 69 kV and above was analyzed – 34.5 kV areas that will not be converted within next 2 years not included in analysis
  - FCITC utilizes DC power flow analysis
    - Only thermal loading violations considered when determining transfer limits
    - System voltage limitations not considered in DC power flow analysis
    - Non-BES system more likely to experience voltage violations before thermal loading violations

<sup>1</sup>Velocity Suite is an analytical software to map energy industry information

*This information is high-level, indicative, and subject to change. For more information, please contact your load serving entity who will work with ITC.*

# Examples

Injection Bus	Voltage Level (kV)	FCITC Transfer Level (MW)	Line Length (Miles)	Cost Factor	Total Index
Bus 6	345	550	7	24.5	0.0318
Bus 5	69	25	3	3	0.0857
Bus 8	345	900	45	157.5	0.1250
Bus 7	345	400	20	70	0.1250
Bus 2	69	80	15	15	0.1339
Bus 10	161	200	35	52.5	0.1875
Bus 3	345	200	20	70	0.2500
Bus 9	161	150	45	67.5	0.3214
Bus 1	69	20	25	25	0.8929
Bus 4	69	25	35	35	1.0000

Stronger



Weaker

Notes: Bus 5 has a lower total index (potentially better place to connect), even though Bus 2's load amount (transfer level) is higher.

This is because Bus 5's cost factor (which is derived from the line length) is significantly lower than Bus 2

## Examples (cont.)

Injection Bus	Voltage Level (kV)	FCITC Transfer Level (MW)	Line Length (Miles)	Cost Factor	Total Index
Bus 6	345	550	7	24.5	0.0318
Bus 5	69	25	3	3	0.0857
Bus 8	345	900	45	157.5	0.1250
Bus 7	345	400	20	70	0.1250
Bus 2	69	80	15	15	0.1339
Bus 10	161	200	35	52.5	0.1875
Bus 3	345	200	20	70	0.2500
Bus 9	161	150	45	67.5	0.3214
Bus 1	69	20	25	25	0.8929
Bus 4	69	25	35	35	1.0000

Stronger



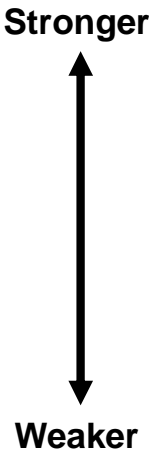
Weaker

Notes: Bus 8 has a lower total index (potentially better place to connect) than Bus 3, even though Bus 8's cost factor is higher.

This is because Bus 8's load amount is higher than Bus 3. However, comparing Bus 8 with Bus 6, Bus 6 has a lower total index because the cost factor is lower

## Examples (cont.)

Injection Bus	Voltage Level (kV)	FCITC Transfer Level (MW)	Line Length (Miles)	Cost Factor	Total Index
Bus 6	345	550	7	24.5	0.0318
Bus 5	69	25	3	3	0.0857
Bus 8	345	900	45	157.5	0.1250
Bus 7	345	400	20	70	0.1250
Bus 2	69	80	15	15	0.1339
Bus 10	161	200	35	52.5	0.1875
Bus 3	345	200	20	70	0.2500
Bus 9	161	150	45	67.5	0.3214
Bus 1	69	20	25	25	0.8929
Bus 4	69	25	35	35	1.0000

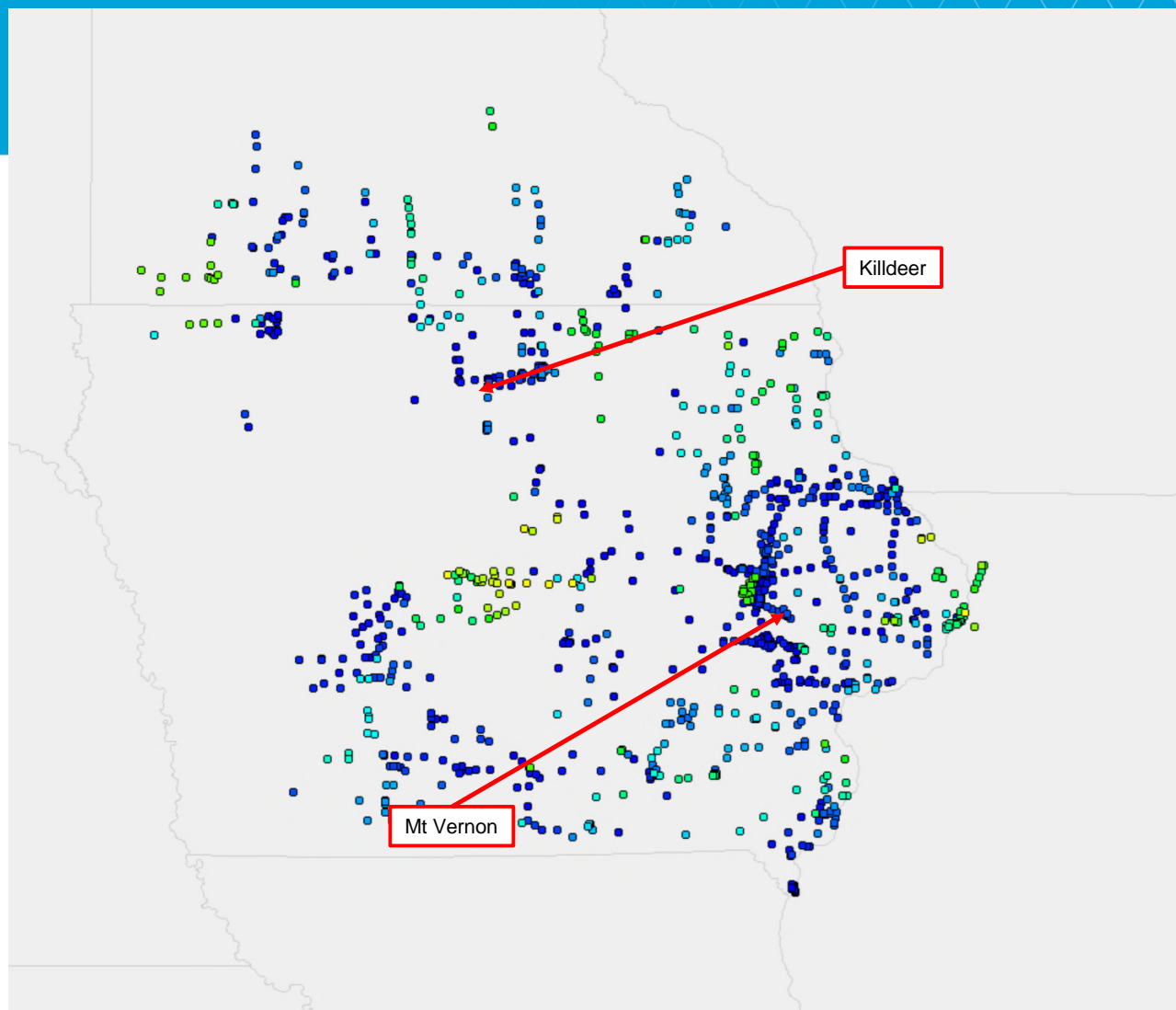

  
**Stronger**  
**Weaker**

Notes: Bus 3 has a slightly lower total index (potentially better place to connect) than Bus 9, even though Bus 3 has a higher (more costly) voltage class associated with it. Since the cost factors are similar, the load amount is the deciding factor

# ITC Midwest Load Map

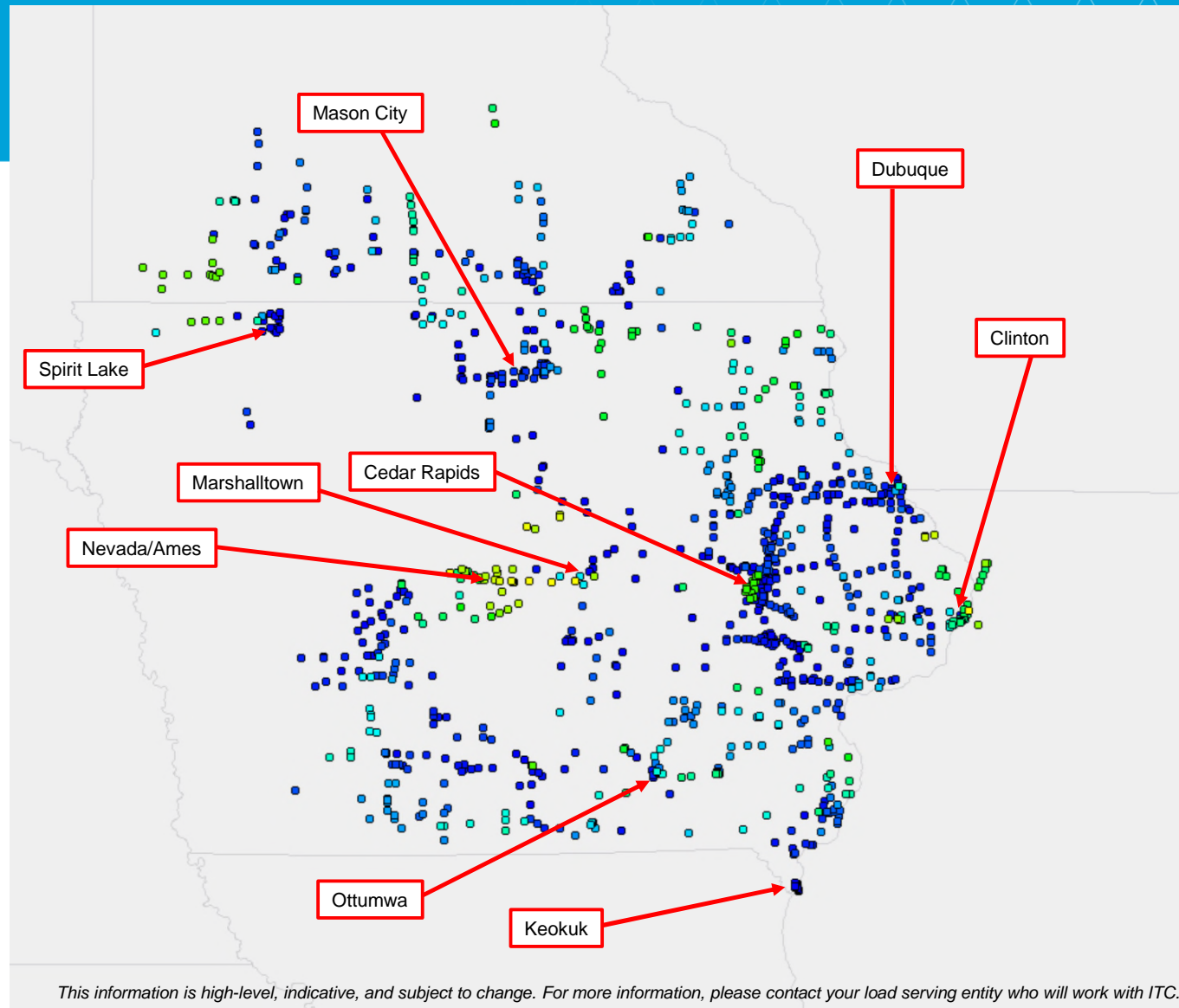
- Load at Killdeer 345 kV Station
  - Two limits found beginning with approximately 500 MW of load through 600 MW
  - Could require rebuilding/replacing approximately 15 circuit miles of 161 kV line and a 345/161 kV transformer
- Load at Mt Vernon Creek 161 kV Station
  - Five limits found beginning with approximately 90 MW of load through 280 MW
  - Could require rebuilding/replacing approximately 20 circuit miles of 161 kV line, 5 miles of 69 kV line, and a 161/69 kV transformer

Dark Blue = Low index (more attractive)  
Yellow = High index (less attractive)



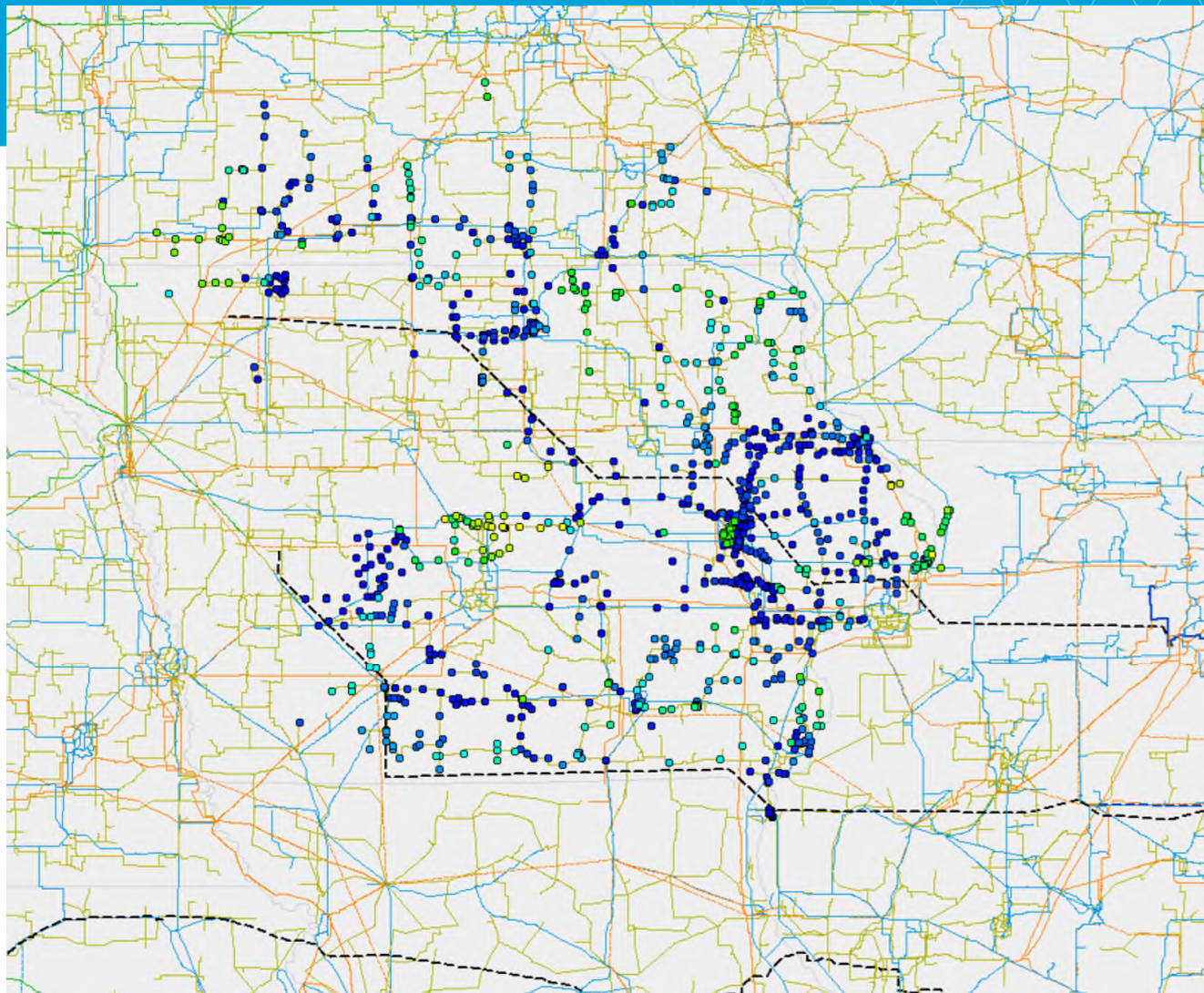
*This information is high-level, indicative, and subject to change. For more information, please contact your load serving entity who will work with ITC.*

# ITC Midwest Load Map

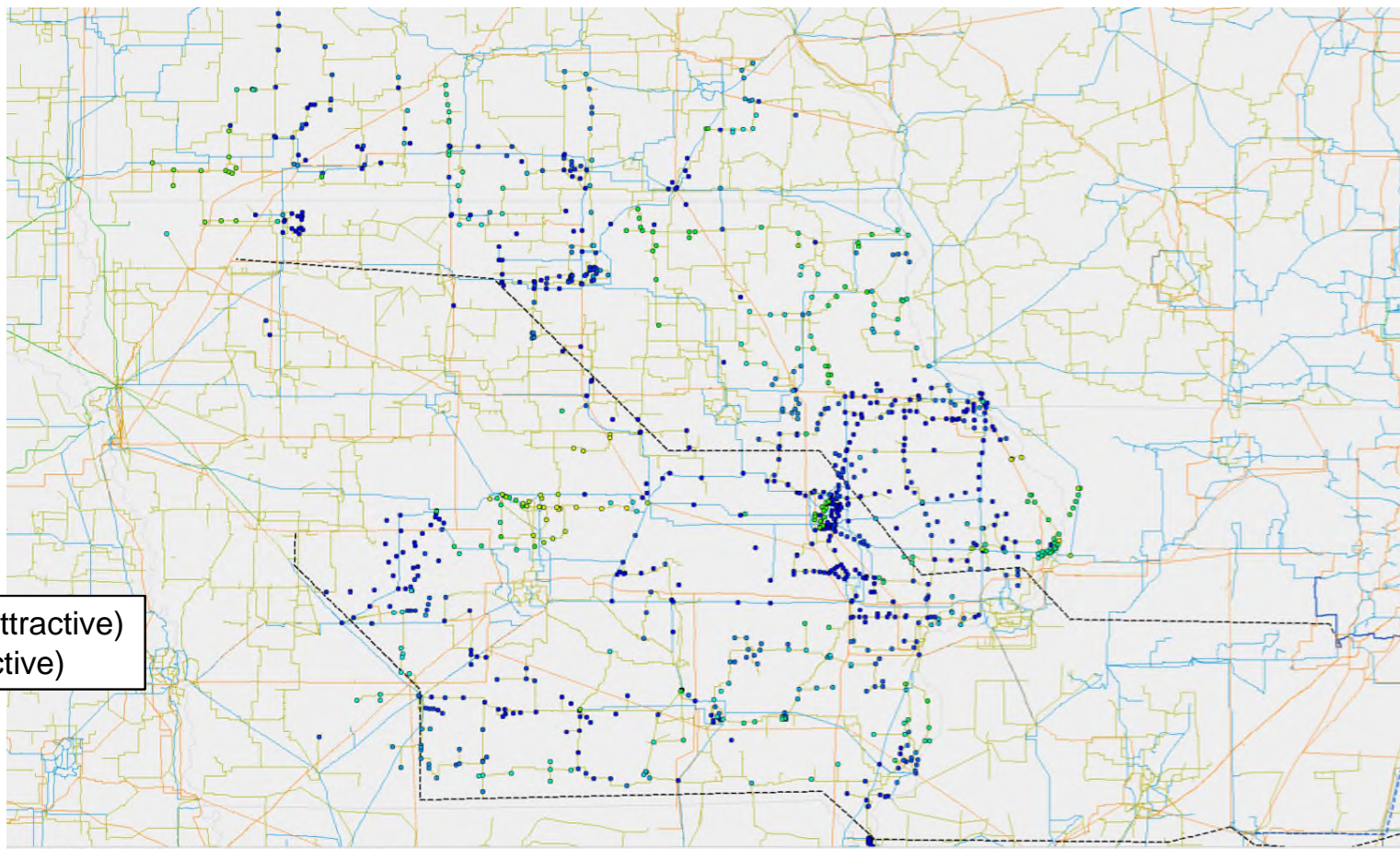


# ITC Midwest Load Map

Dark Blue = Low index (more attractive)  
Yellow = High index (less attractive)



# ITC Midwest Load Map



Dark Blue = Low index (more attractive)  
Yellow = High index (less attractive)

## Next Steps

- This Map is intended to be updated periodically (annually)
  - The map is not confidential and will be shared
- The study is a work in progress
  - Algorithm revisions are expected over time

# Feedback / Questions?

# ITC Midwest 2025 Projected Formula Rate



**Matt Bogdan**

*Manager, Transmission Pricing & Rates*  
*[mbogdan@itctransco.com](mailto:mbogdan@itctransco.com)*



**FOR THE GREATER GRID**

# Agenda



- Meeting Purpose
- Formula Rate Protocol Cycle
- Walk through the 2025 Projected Formula Rate Calculation
- Discuss Key Drivers of the 2025 Projected Formula Rate
- Template Changes
- Next Steps for Stakeholders

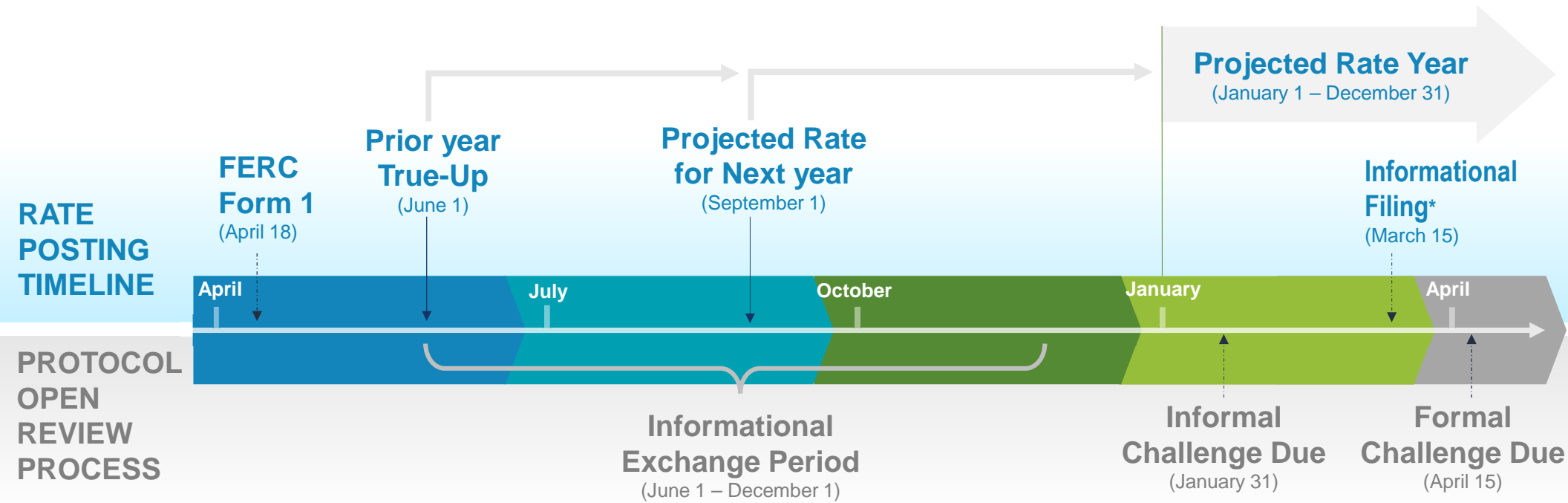
# Meeting Purpose

**Discuss ITC Midwest's 2025 Projected Rate, which was posted on August 30, 2024, and will be in effect from January 1, 2025 – December 31, 2025**

The rate postings, along with all content, can be found on the MISO Transmission Owners rate page and OASIS, or by using the link below:

- [ITC Midwest – 2025 Projected Rate Posting](#)

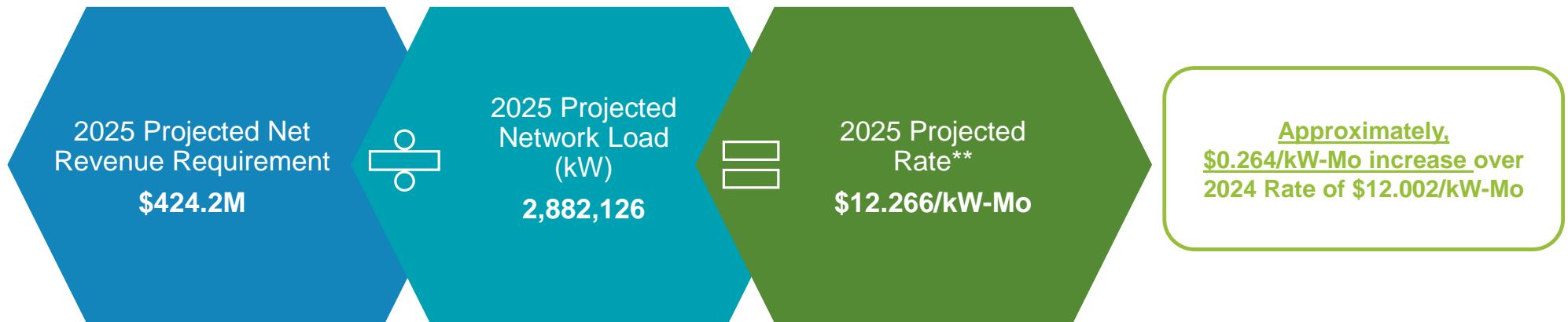
# Formula Rate Protocol Cycle



\*Includes complete True-Up and projected rate postings published the prior year

# 2025 Projected Formula Rate Calculation

ITC Midwest's 2025 Projected Network Rate is **\$12.266/kW-Mo**



# ITC Midwest's 2025 Network Rate is \$12.266/kW-Mo.

## Higher Return on Rate Base

- Due to capital projects projected to be placed in-service in 2024 and 2025

## Higher Expenses & Taxes

- Higher depreciation expense and income taxes primarily driven by higher plant balances and projected capital in-service transfers

## Higher Credits/Offsets

- Due to the regional allocation of Cardinal Hickory Creek's revenue requirement now having a full impact on the Network Rate

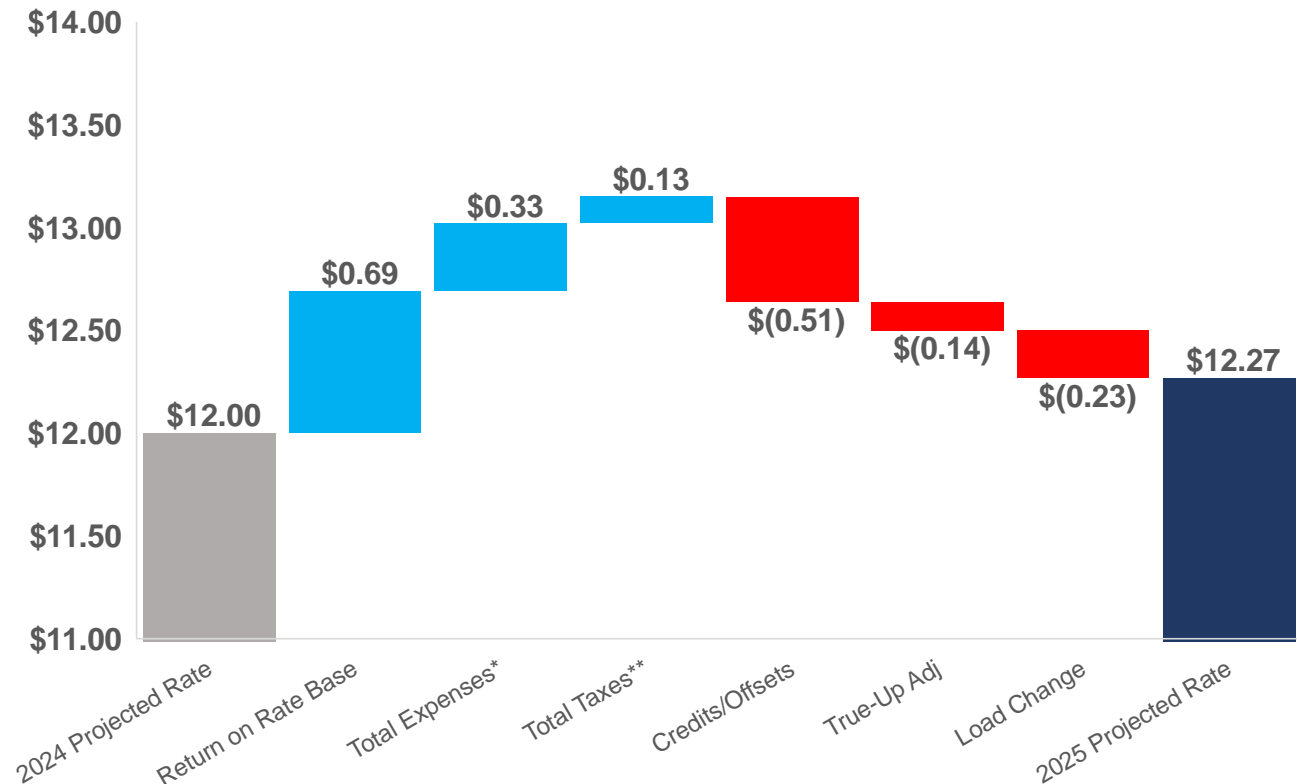
## Higher True-Up Adjustment

- \$15.0M over-recovery in 2022 to a \$19.8M over-recovery in 2023

## Higher Load

- Projected load increased by 2.0%

ITC Midwest Projected 2024 - 2025 Rate Change  
\$/kW-Mo



\*Expenses includes Depreciation & Amortization expense, and O&M/A&G expense

\*\*Total Taxes includes Income Taxes and Taxes Other Than Income Taxes (TOIT)

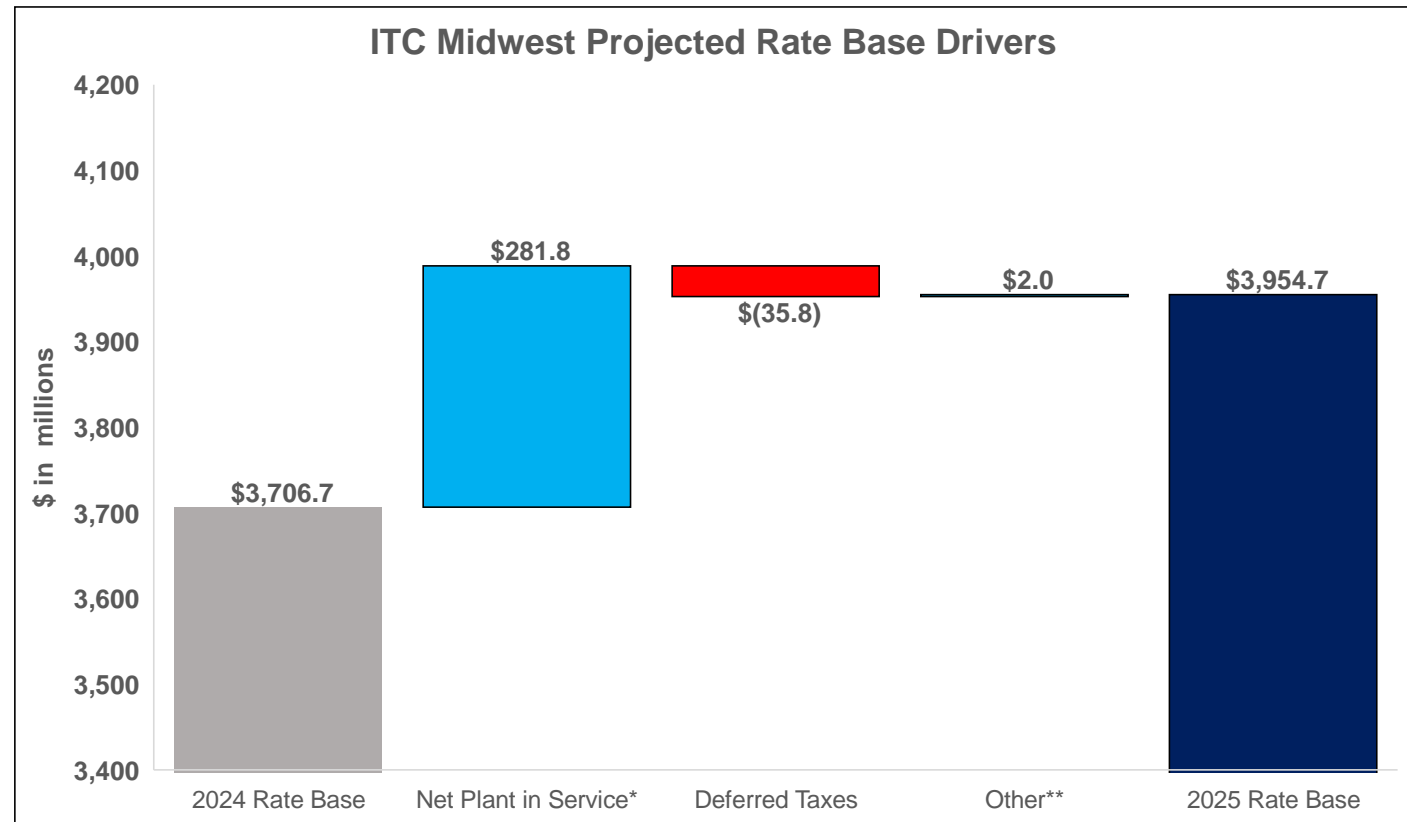
# Key Drivers For Projected 2025 Rate Base

## Higher Net Plant in Service

- Due to projected capital in-service transfers

## Higher Deferred Taxes

- Primarily because of higher ADIT balance due to increased capital in-service transfers



\*Net Plant In Service change of \$281.8M includes Gross Plant in Service of \$362.7M less Accumulated Depreciation \$80.9M.

\*\*Other is made up of Cash Working Capital, Materials & Supplies, Land Held for Future Use and Prepayments

# Major Projected 2025 Transfers to Plant in Service

Major Projects (\$ in thousands)	Transfers to Projected Plant In Service	Impact on 13-Month Average
BES Communication Addition Program	\$59,952	\$23,516
MISO LRTP Skunk River - Ipava**	28,295	20,949
OH-UG NRUC*/Reliability	25,335	13,809
Substation NRUC*/Reliability	24,272	11,014
Nevada Area Load Interconnections	23,389	6,464
Dovray Tap-Fulda Junction 69kV Rbld	22,440	6,905
34.5kV to 69kV Conversion Phase 1	15,089	7,910

- Planned capital additions include expected line, substation, and other construction projects that are currently known
- Projects identified represent our best estimates for projects to be initiated and completed
- Note that many factors such as regulatory approvals, construction resources, availability of materials, weather and other unforeseen events, could alter projections and schedules

# Template Changes

- On October 24, 2023, FERC approved MISO companies' ADIT Worksheets under ER20-1298:
  - Workpapers to show the remeasurement of deferred tax balances upon a change in tax rate and subsequent amortization of (excess)/deficient deferred income tax tied to the remeasurement
  - Workpapers were included in the reposting of the 2024 projected rate template
- The charges billed under the formula rate did not change as a result of these template changes

# Next Steps

- Information Exchange Process:



Submit any information requests in writing to: [misoformularates@itctransco.com](mailto:misoformularates@itctransco.com) no later than December 1, 2024



ITC Midwest will respond via email within fifteen (15) business days of receipt of such requests



All questions and answers will also be posted on the OASIS and MISO Rate Data page



# Appendix

# ITC Midwest's Projected Rate

Description	2025 Projected	2024 Projected	Increase/ (Decrease)	% Variance
Projected Gross Plant in Service	\$ 5,581,729,461	\$ 5,218,995,289	\$ 362,734,172	
Accumulated Depreciation	928,076,963	847,173,351	80,903,612	
Deferred Income Taxes	-779,642,220	-743,848,415	-35,793,805	
M&S/Prepayment/CWC/Land	80,686,252	78,722,388	1,963,864	
<i>Rate Base</i>	<i>\$ 3,954,696,530</i>	<i>\$ 3,706,695,911</i>	<i>\$ 248,000,619</i>	<i>6.7%</i>
<i>Return on Rate Base</i>	<i>\$ 327,470,385</i>	<i>\$ 303,815,524</i>	<i>\$ 23,654,861</i>	<i>7.8%</i>
O&M Expenses	37,807,008	36,809,680	997,328	
A&G Expenses	39,517,723	38,896,761	620,962	
Depreciation & Amortization Expense	138,111,786	128,414,648	9,697,138	
Income Taxes	89,735,410	83,534,172	6,201,238	
Taxes Other than Income Taxes	20,063,435	21,650,335	-1,586,900	
<i>Total Expenses</i>	<i>\$ 325,235,362</i>	<i>\$ 309,305,596</i>	<i>\$ 15,929,766</i>	<i>5.2%</i>
Credits/Offsets (Sch. 26, 26A, PTP, Rent, Schedule 50)	208,671,385	191,058,498	17,612,887	
True-Up Adjustments	-19,814,506	-14,962,903	-4,851,603	
Projected Net Revenue Requirement*	424,219,856	407,099,719	17,120,137	
Projected Network Load (based on 12 CP; kW)	2,882,126	2,826,574	55,552	
<b>Projected Rate (\$/kW-Mo)</b>	<b>\$ 12.266</b>	<b>\$ 12.002</b>	<b>\$ 0.264</b>	<b>2.2%</b>

# Calculation of ITC Midwest's Rate Base

Rate Base Items	2025 Projected	2024 Projected	Increase/ (Decrease)	% Variance
Gross Plant in Service	\$ 5,581,729,461	\$ 5,218,995,289	\$ 362,734,172	
- Accumulated Depreciation	928,076,963	847,173,351	80,903,612	
<b>Net Plant in Service*</b>	<b>\$ 4,653,652,498</b>	<b>\$ 4,371,821,938</b>	<b>\$ 281,830,560</b>	<b>6.4%</b>
+ Accumulated Deferred Income Taxes	-779,642,220	-743,848,415	-35,793,805	
+ Materials & Supplies	63,927,358	62,842,050	1,085,308	
+ Land Held for Future Use	1,340,841	1,340,841	0	
+ Prepayments	5,752,462	5,076,192	676,270	
+ Working Capital	9,665,591	9,463,305	202,286	
<b>= Total Rate Base*</b>	<b>\$ 3,954,696,530</b>	<b>\$ 3,706,695,911</b>	<b>\$ 248,000,619</b>	<b>6.7%</b>

# Calculation of Rate of Return & Allowed Return

Cost of Capital	Weight	Cost	2025 Projected WACC	2024 Projected WACC	Increase/(Decrease)
Equity	60%	10.77%	6.46%	6.46%	
Debt**	40%	4.55%	1.82%	1.73%	
<b>Rate of Return*</b>			<b>8.28%</b>	<b>8.20%</b>	<b>0.08%</b>

Allowed Return	2025 Projected Amount	2024 Projected Amount	Increase/(Decrease)	% Variance
Rate Base	\$ 3,954,696,530	\$ 3,706,695,911	\$ 248,000,619	
x Return (above)	8.28%	8.20%		
<b>= Allowed Return*</b>	<b>\$ 327,470,385</b>	<b>\$ 303,815,524</b>	<b>\$ 23,654,861</b>	<b>7.8%</b>

\*Totals may not reconcile due to rounding

\*\*The cost of debt for 2024 Projections was 4.06%

# Calculation of Gross Revenue Requirement before Revenue Credits & Offsets

Operating Expense + Income Taxes	2025 Projected Amount	2024 Projected Amount	Increase/ (Decrease)	% Variance
Operation & Maintenance Expenses	\$ 37,807,008	\$ 36,809,680	997,328	
Administrative & General Expenses	39,517,723	38,896,761	620,962	
Depreciation Expense	138,111,786	128,414,648	9,697,138	
Taxes Other Than Income Taxes	20,063,435	21,650,335	-1,586,900	
Income Taxes	89,735,410	83,534,172	6,201,238	
<b>Total Operating Expenses + Income Taxes*</b>	<b>\$ 325,235,362</b>	<b>\$ 309,305,596</b>	<b>\$ 15,929,766</b>	<b>5.2%</b>

Projected Gross Revenue Requirement	2025 Projected Amount
2025 Projected Allowed Return (from previous slide)	\$ 327,470,381
+ Projected Operating Expenses + Income Taxes (above)	325,235,362
<b>2025 Projected Gross Revenue Requirement before Revenue Credits &amp; Offsets*</b>	<b>\$ 652,705,747</b>

# Calculation of Revenue Requirement after Revenue Credits & Offsets

Gross Revenue Requirement & Revenue Credits & Offsets	2025 Projected Amount	2024 Projected Amount	Increase/(Decrease)	% Variance
Gross Revenue Requirement before Revenue Credits & Offsets	\$ 652,705,747	\$ 613,121,120	\$ 39,584,627	
Less: Attachment GG Revenue Requirement (Sch. 26)	26,414,271	26,697,356	-283,085	
Less: Attachment MM Revenue Requirement (Sch. 26A)	153,051,266	136,495,084	16,556,182	
Less: Point-to-Point/Other Transmission Service Revenues	26,952,855	24,786,644	2,166,211	
Less: Rental & Schedule 50 Revenues	2,252,993	3,079,414	-826,421	
<b>Total Revenue Credits &amp; Offsets*</b>	<b>\$ 208,671,385</b>	<b>\$ 191,058,498</b>	<b>\$ 17,612,887</b>	<b>9.2%</b>
<b>Total 2025 Projected Revenue Requirement after Revenue Credits &amp; Offsets*</b>	<b>\$ 444,034,362</b>	<b>\$ 422,062,622</b>	<b>\$ 21,971,740</b>	<b>5.2%</b>

\*Totals may not reconcile due to rounding

# Calculation of Net Revenue Requirement after 2023 True-Up

Net Revenue Requirement	
2025 Projected Revenue Requirement after Revenue Credits & Offsets	\$ 444,034,362
+ 2023 True-up Adjustment under/(over) Recovery	-19,814,506
<b>2025 Projected Net Revenue Requirement (including 2023 True-up Adjustment*)</b>	<b>\$ 424,219,856</b>



# Questions?



**Matt Bogdan**

*Manager, Transmission Pricing & Rates*  
*[mbogdan@itctransco.com](mailto:mbogdan@itctransco.com)*



**Break**

# L RTP Tranche 2.1



**Robert Walter**

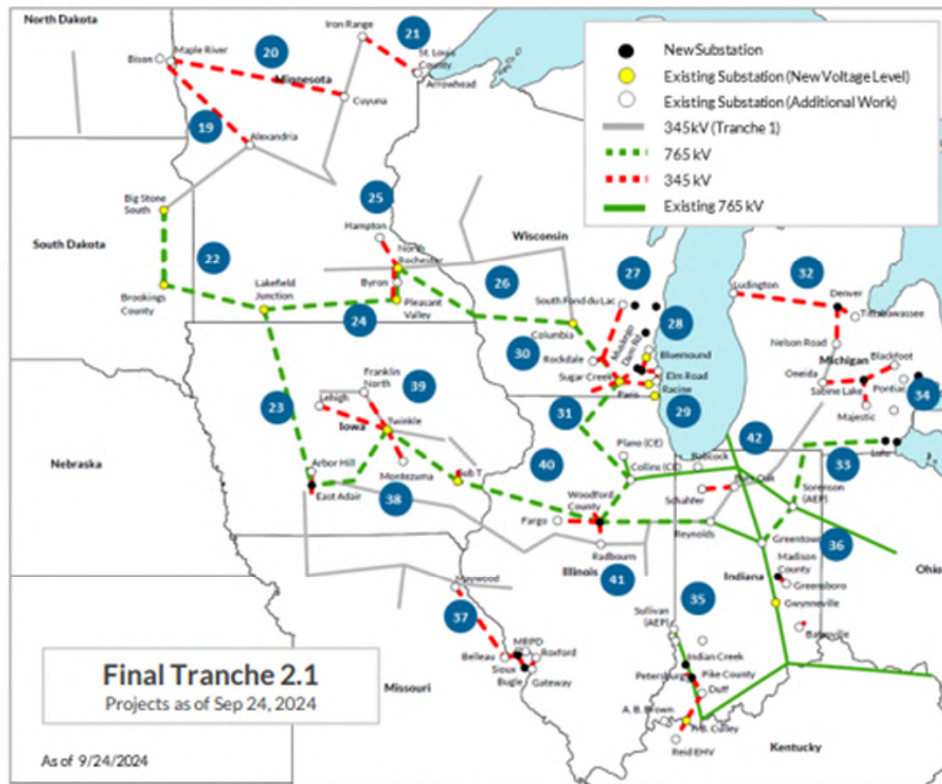
*Manager, Planning*  
*[rwalter@itctransco.com](mailto:rwalter@itctransco.com)*



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# Tranche 2.1 Portfolio (MISO provided information)

## Final LRTP Tranche 2.1 Portfolio



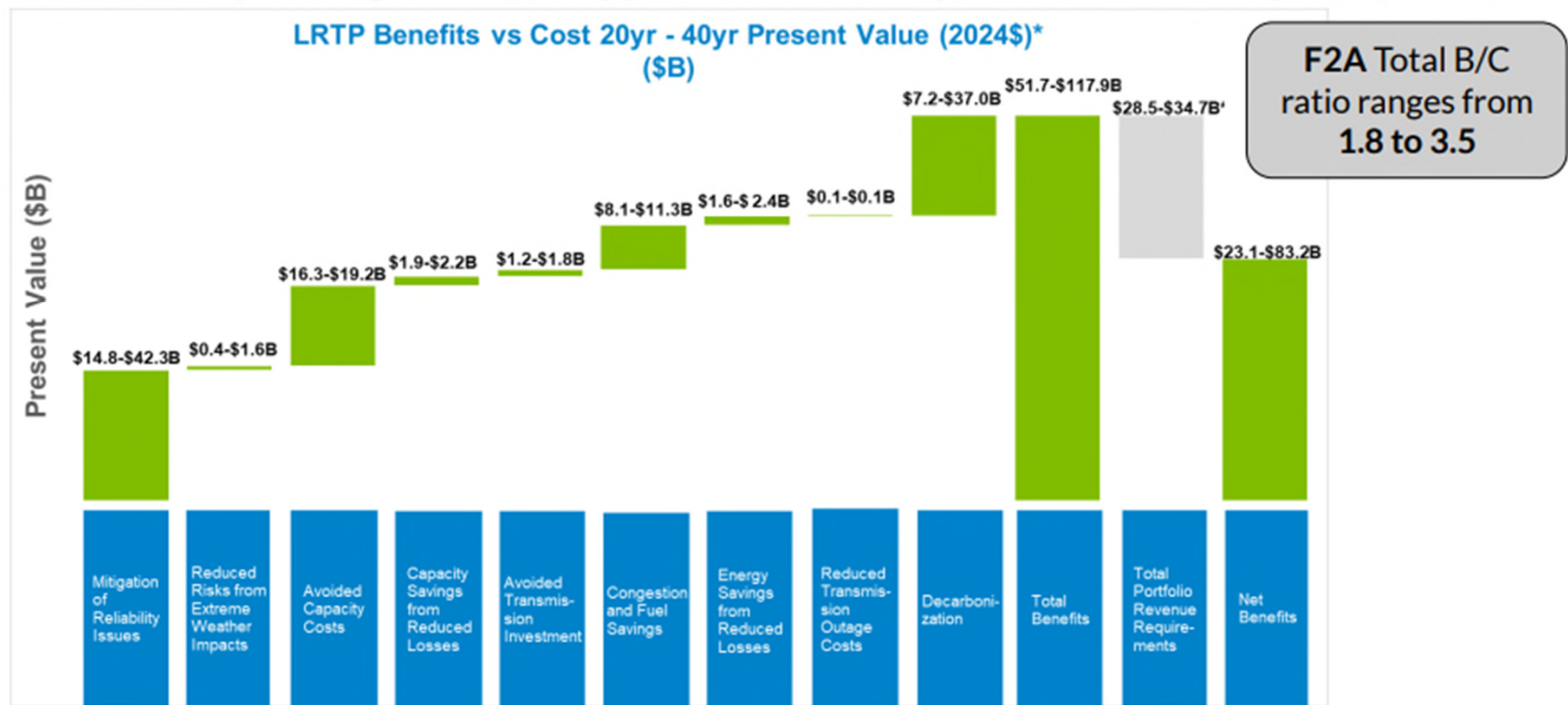
- 24 projects across the MISO Midwest Subregion
- Estimated at \$21.8 billion
- In service dates range from 2032 to 2034\*

ID	Project Description	Predominate kV	Targeted ISD	Est. Cost (\$M, 2024)
19	Bison - Alexandria	345	2032	\$216
20	Maple - Cuyuna	345	2032	\$908
21	Iron Range - Arrowhead	345	2032	\$428
22	Big Stone South - Brookings County - Lakefield Junction	765	2034	\$1,459
23	Lakefield Junction - East Adair	765	2034	\$1,375
24	Lakefield Junction - Pleasant Valley - North Rochester	765	2034	\$1,166
25	Pleasant Valley - North Rochester - Hampton Corner	345	2032	\$222
26	North Rochester - Columbia	765	2034	\$1,924
27	Rocky Run - Werner - North Appleton	345	2032	\$212
28	South Fond du Lac - Rockdale - Big Bend - Sugar Creek - Kitty Hawk	345	2032	\$1,102
29	Bluemonnd - Arcadian - Waukesha - Muskego - Elm Road - Racine	345	2032	\$731
30	Columbia - Sugar Creek	765	2034	\$743
31	Sugar Creek - Collins	765	2033	\$733
32	Ludington - Denver - Tittabawassee & Nelson Road	345	2032	\$1,553
33	Greentown - Sorenson - Lulu	765	2033	\$1,310
34	Oneida - Sabine Lake - Blackfoot & Majestic	345	2032	\$584
35	Southwest Indiana-Kentucky	345	2032	\$743
36	Southeast Indiana	345	2032	\$578
37	Maywood - Belleau - MRPD - Sioux - Bugle	345	2032	\$888
38	East Adair - Marshalltown - Sub T	765	2034	\$1,583
39	Lehigh - Marshalltown - Franklin North & Montezuma	345	2032	\$588
40	Sub T - Woodford County - Collins & Reynolds	765	2033	\$2,298
41	Woodford County - Fargo & Radbourn	345	2032	\$422
42	Burr Oak - Schahfer	345	2032	\$68
<b>Total Portfolio Cost</b>			<b>Total</b>	<b>\$21.830</b>

from MISO Tranche 2.1 workshop on 9/24/24

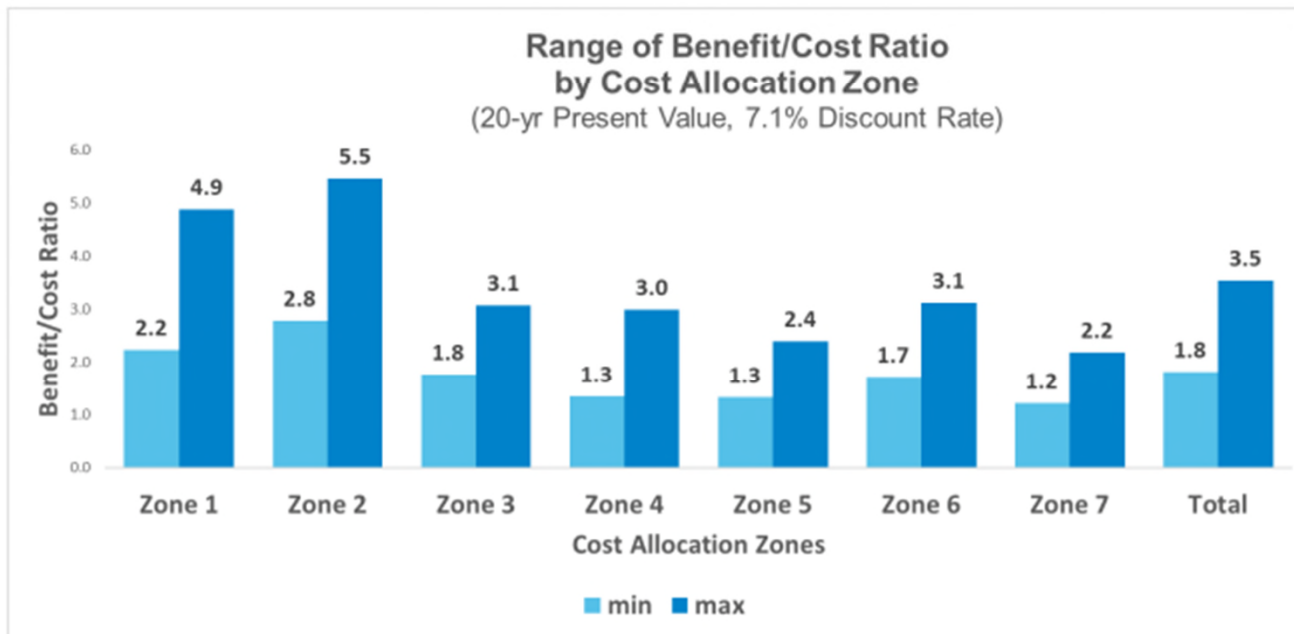
# Tranche 2.1 (MISO provided information)

Tranche 2.1 portfolio under Future 2A provides a regional benefit-to-cost ratio of at least 1.8 capturing multiple types of reliability, economic and policy value



# Tranche 2.1 (MISO provided information)

Tranche 2.1 portfolio benefits exceed costs and are broadly distributed across the Midwest Subregion with each zone showing a B/C ratio > 1.0\* under Future 2A



**Map of Midwest Cost Allocation Zone Boundaries\***



\*MISO Tariff, Attachment WW



# MTEP 25 – ITC Midwest Project Submittals

# MTEP Process Overview

- Projects are submitted in September for approval in following December
  - MTEP 25 projects submitted in September 2024, approval by MISO in December 2025
- MISO to hold 3 subregional planning meetings each MTEP cycle
  - ITC Midwest projects covered in the West Subregional Planning Meeting or West SPM
  - First Subregional Planning Meeting is held in 1<sup>st</sup> quarter of the year
  - Second Subregional held in 2<sup>nd</sup> quarter
  - Third Subregional Planning Meeting held in 3<sup>rd</sup> quarter of the year prior to MTEP plan being finalized and moved through the MISO approval process



# MTEP Process - How to get involved

- MISO seeks stakeholder feedback and any alternatives for select projects
  - Questions on projects can be submitted directly to MISO if stakeholders want questions documented in the MTEP report/process
  - Generally, baseline reliability or similar projects can have alternatives submitted for consideration in the MISO planning process
- New MISO Planning Portal allows stakeholders who have requested and approved Planning Portal access the ability to view project information when submitted to MISO



# ITC Midwest MTEP 25 Projects

- One line rebuild projects driven by age and condition of assets
- Two Station Upgrade projects driven by age and condition of assets
  - Replacement of relays, control enclosures, transformers
- Three customer connection projects
- Two reliability driven projects
- Eight generator interconnection projects
- Three Blanket Projects
  - Asset Management, Small customer interconnection with short lead time, and SCADA controlled Motor Operator Switch Addition blanket



# MTEP 25 Age and Condition Line Rebuilds

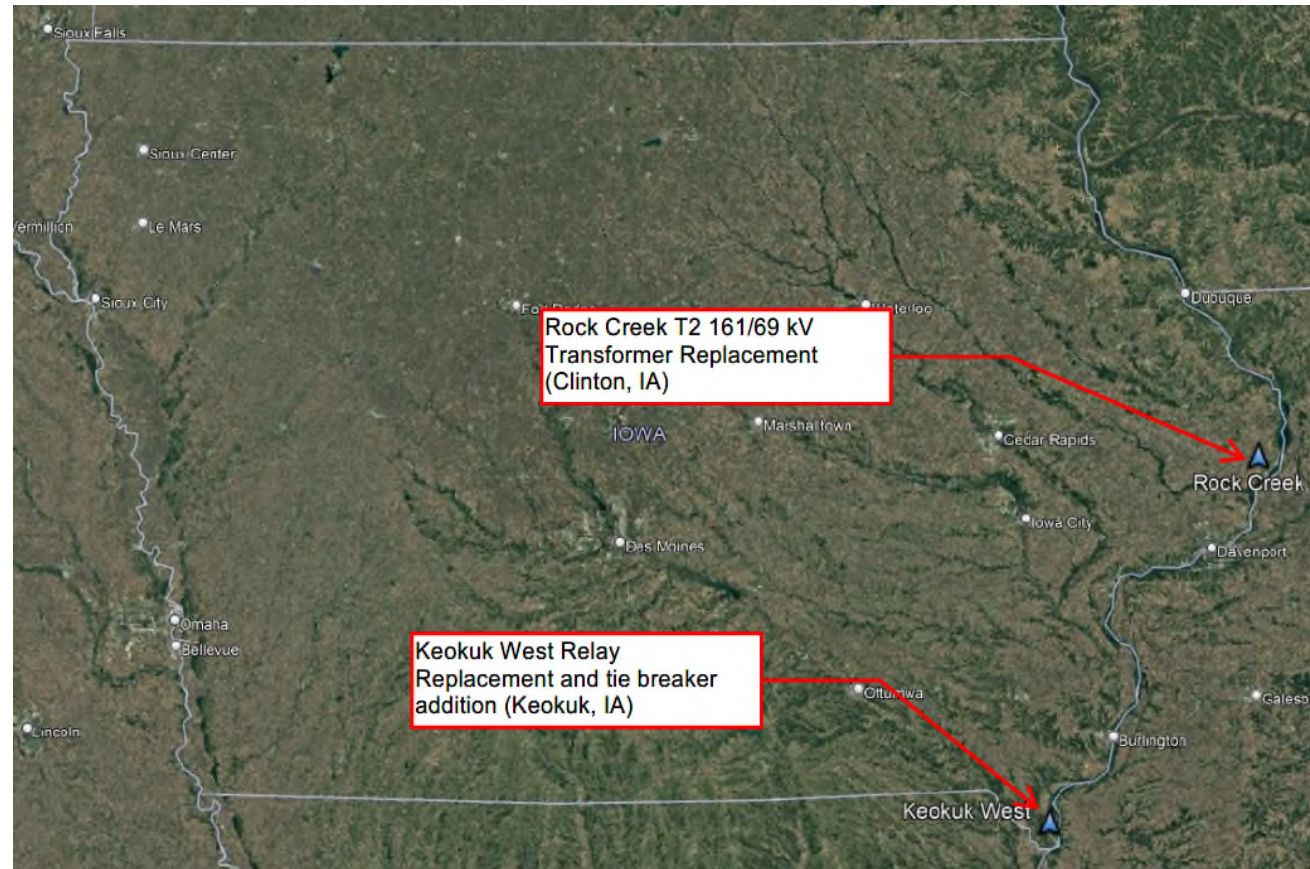
## • Belmond Diesel – Hancock 69 kV line re-route

- Existing route south of Klemme, Iowa is parallel to railroad and river and is being washed out by the river
- Due to limitations of line being located between railroad and river, the line needs to be re-routed to address wash out issues
- Approximately 3 miles will be routed away from the railroad and river and along roads to address washout
- Line section was originally constructed in 1970's and nearing the end of its useful life



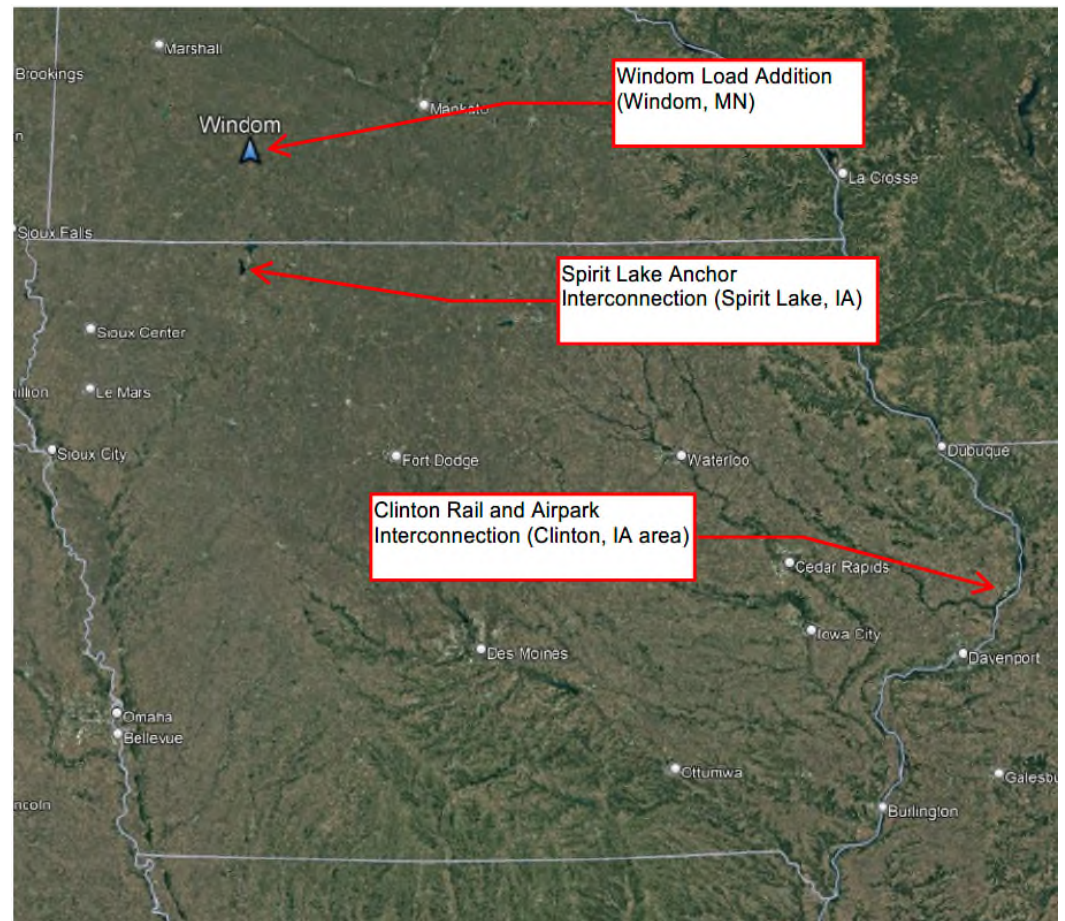
# MTEP 25 Age and Condition Station Upgrades

- **Rock Creek T2 161/69 kV Transformer Replacement (Clinton, IA area)**
  - Existing 161/69 kV transformer is at the end of its useful life and in need of replacement
  - High side breaker to be added to increase reliability for transformer faults
- **Keokuk West Relay Replacement and tie breaker addition (Keokuk, IA)**
  - Existing relays are at the end of their useful life and in need of replacement
  - ITC to install new ITC owned control enclosure to allow IPL space in their existing building for future substation rebuild
  - ITC to add tie breaker to increase reliability for bus faults



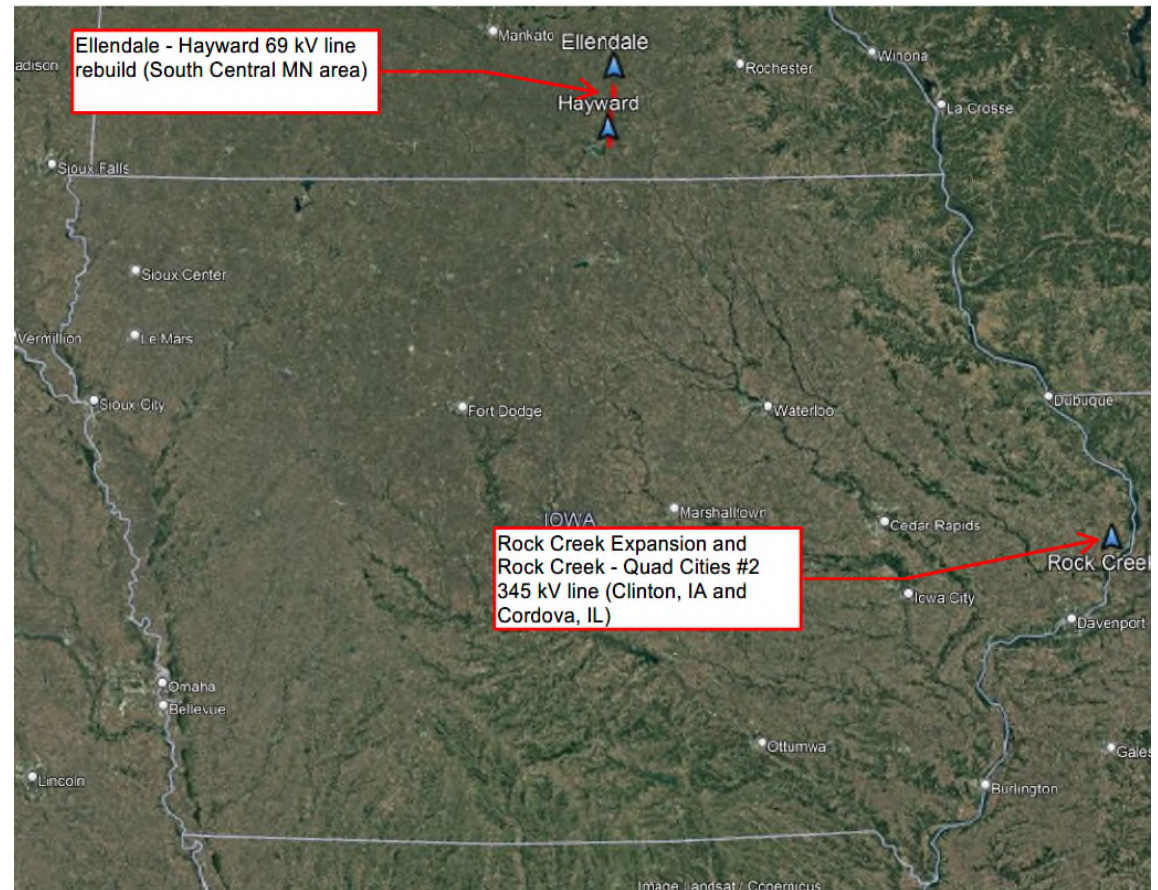
# MTEP 25 Customer Connections

- **Clinton Rail and Air Park Interconnection (Clinton, IA area)**
  - New joint IPL ITC Midwest substation near Clinton, IA
  - Substation supports new load interconnection and area load growth
- **Spirit Lake Anchor Interconnection (Spirit Lake, IA)**
  - Supports IPL load growth in Spirit Lake, IA
  - Allows IPL to retire substations nearing end of useful life and consolidate load on the new substation
- **Windom Load Addition (Windom, MN)**
  - Provides interconnection for a new City of Windom substation
  - Includes addition of 69 kV capacitor bank at ITC Midwest Windom switching station to support City of Windom load addition



# MTEP 25 Reliability Upgrades

- **Rock Creek Expansion and Rock Creek – Quad Cities 345 kV #2 (Clinton, IA and Cordova, IL)**
  - Expands Rock Creek 345 kV to breaker and ½ configuration to accommodate additional needed line terminals
  - Adds 2<sup>nd</sup> Rock Creek – Quad Cities #2 345 kV line on existing spare position on existing structures and increases thermal rating on existing Rock Creek – Quad Cities #1 345 kV line
- **Ellendale – Hayward 69 kV rebuild**
  - Rebuilds existing Ellendale – Hayward 69 kV line to increase thermal rating on the line
  - Line from Ellendale to West Owatonna previously rebuilt, and now southern portion of the line requires rebuild to address overloads for various system conditions





# 34.5 to 69 kV Conversion Update



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# Value of conversion to 69 kV operation

Conversion changes operation of the system from radial 34.5 kV circuits to networked 69 kV operation of circuits

- Converting to 69 kV operation increases capacity on a line and helps provide additional ability to serve future load growth
- Conversion allows lines not needed while operating in a networked 69 kV configuration to be retired
- Networked 69 kV operation provides a system that is better able to maintain voltage while providing alternate paths for the power to flow during planned and unplanned outages
  - By operating the 69 kV system in a networked configuration, multiple sources simultaneously feed into an area, providing greater redundancy and improving system voltage performance under normal and outage conditions



# ITC Midwest's Commitment on Rebuilds and Conversions

ITC Midwest made a commitment to the Iowa Utilities Commission for rebuilding and converting the 34.5 kV system

- 14 years to rebuild the 34.5 kV lines that will be converted to future 69 kV operation
  - Line rebuilds completed by end of 2021\*
- 22 years to convert the system to 69 kV operation
  - Conversions to be completed by end of 2029

\*After coordinating with stakeholders, ITC Midwest has identified 13 miles that would not be completed by the end of 2021

# 34.5 to 69 kV rebuild and conversion progress



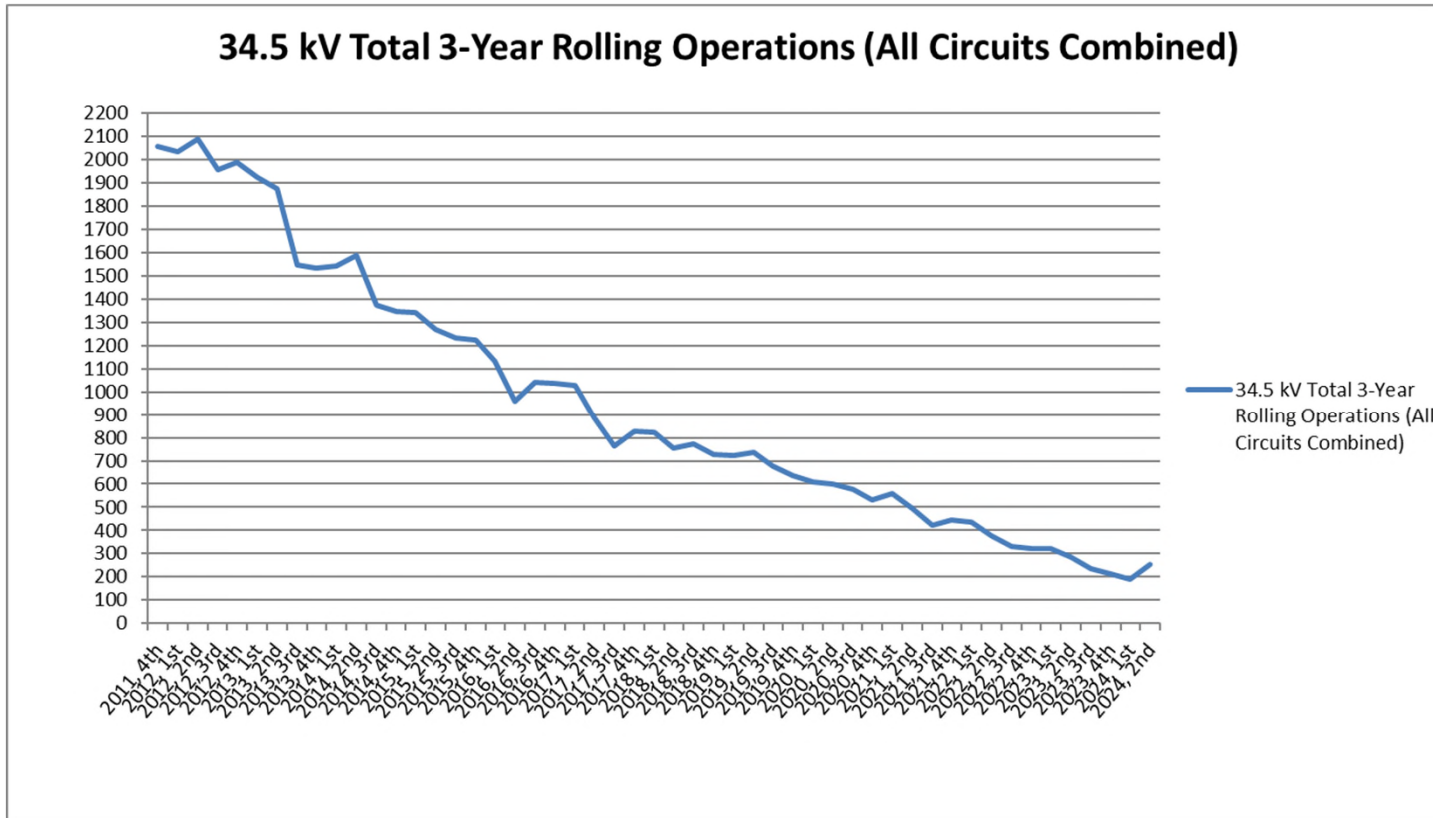
- **641 miles of rebuilds completed by end of 2021**
  - 98% of rebuilds completed
  - 651 total miles of rebuilds required
  - 10 miles to be rebuilt after 2024
- **36 new 69 kV circuits converted by end of 2024**
  - 58% of total conversions completed
  - ITC started with 149 34.5 kV circuits and those will become 62 new networked 69 kV circuits when all conversions are completed
  - Includes ITC and CIPCO conversions
- **Future Planned conversions:**
  - Average of 4 conversions per year for 2025 – 2028
  - 14 conversions remaining post 2028

## 34.5 kV System Reliability

Through regular interdepartmental communications, ITC Planning and Asset Management departments determine level of maintenance required on assets that are planned for ultimate retirement once an area is converted to 69 kV operation

- ITC is careful to limit spending on lines that have a projected replacement or retirement date
- ITC considers stakeholder input and impacts when scheduling conversion projects
  - Impacts could be financial or operational in nature
  - 98% of line rebuilds completed by end of 2024
- 34.5 kV total operations continue to trend downward and flatten now that the line rebuilds are completed
  - Total operations includes both momentary and sustained outages

# 34.5 kV System Reliability

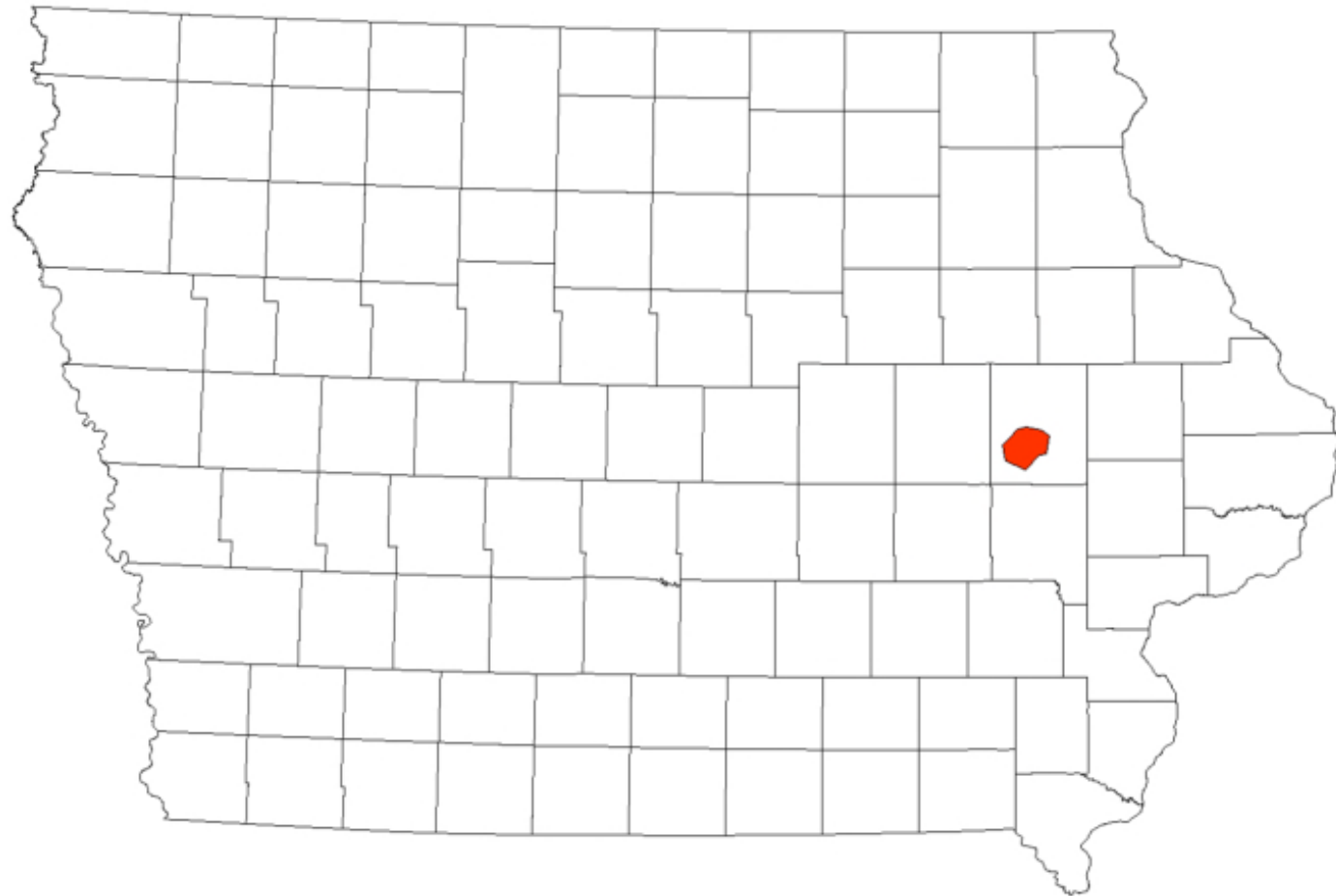


## 34.5 to 69 kV Study and Coordination Process

- All study work for the 34.5 to 69 kV conversions has been completed and plans continue to be refined based on stakeholder plans and feedback for each study area
- All planned rebuilds and conversions submitted to and approved in MISO MTEP process
  - Additional MTEP submissions may be required based on plan updates from stakeholders which require additional ITC projects to support stakeholder plans
  - Examples of this are new customer connection request projects to connect new substations related to 34.5 to 69 kV conversions
- Project schedule coordination is an ongoing process and project schedules continue to be updated based on stakeholder input and needs

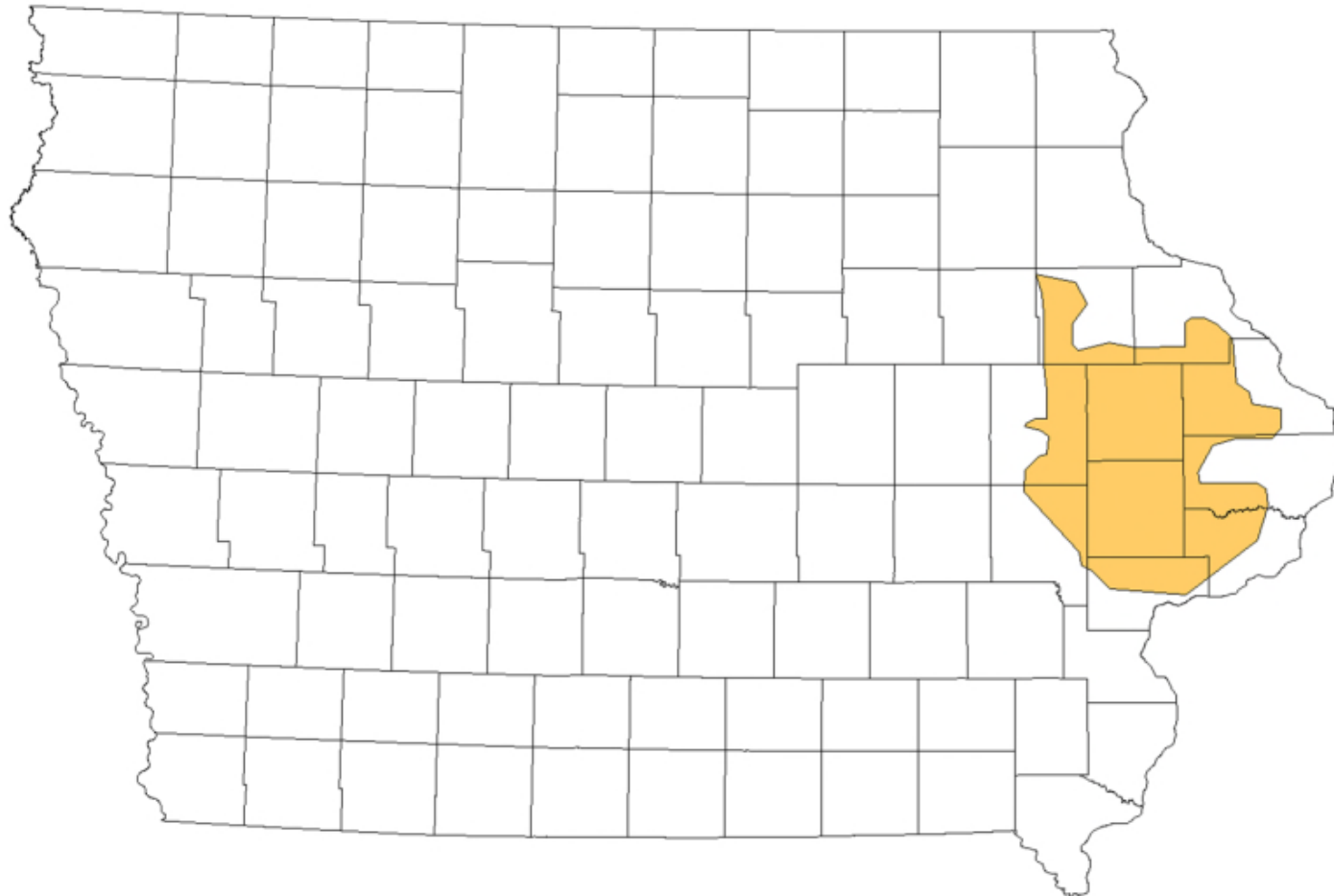
# Cedar Rapids Area

- All 29 miles of rebuilds completed
- 6 new 69 kV circuits converted, 1 remaining
  - 86% conversions completed
- Upcoming Area Projects:
  - Emerald Isle – Beverly Conversion
- Future Area Retirements:
  - 4 miles of 34.5 kV line to be retired
  - 1 substation retirement, 1 partial substation retirement



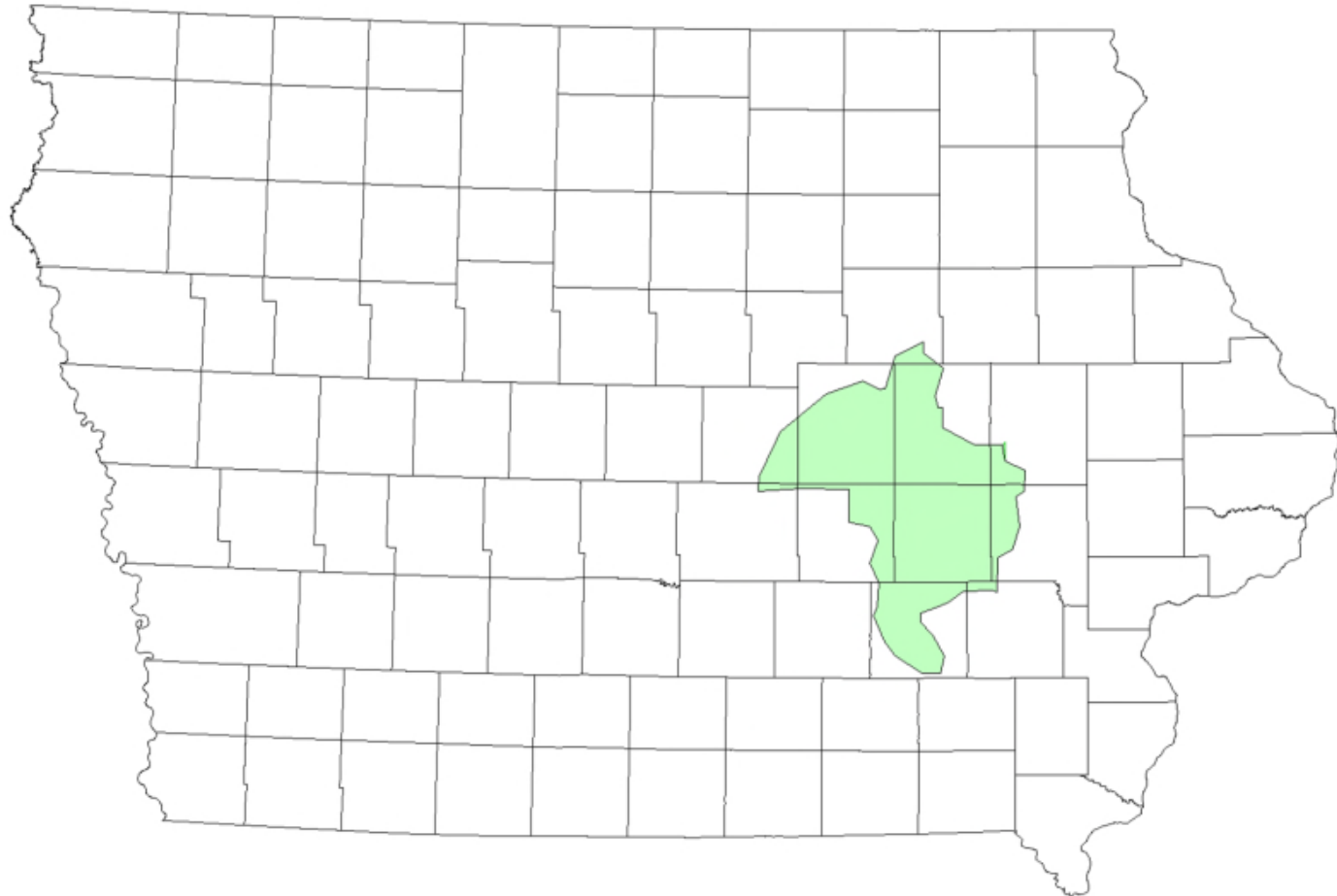
# Eastern Iowa Area

- 143 miles rebuilt, 7 miles remaining
  - 95% rebuilds complete
- 12 new 69 kV circuits converted, 4 remaining
  - 75% conversions complete
- Upcoming Area Projects:
  - Walcott Bredenkamp Interconnection
  - Clarence South – Jones conversion
- Future Area Retirements:
  - 66 miles of 34.5 kV line to be retired
  - 2 substation retirements, 1 partial substation retirements



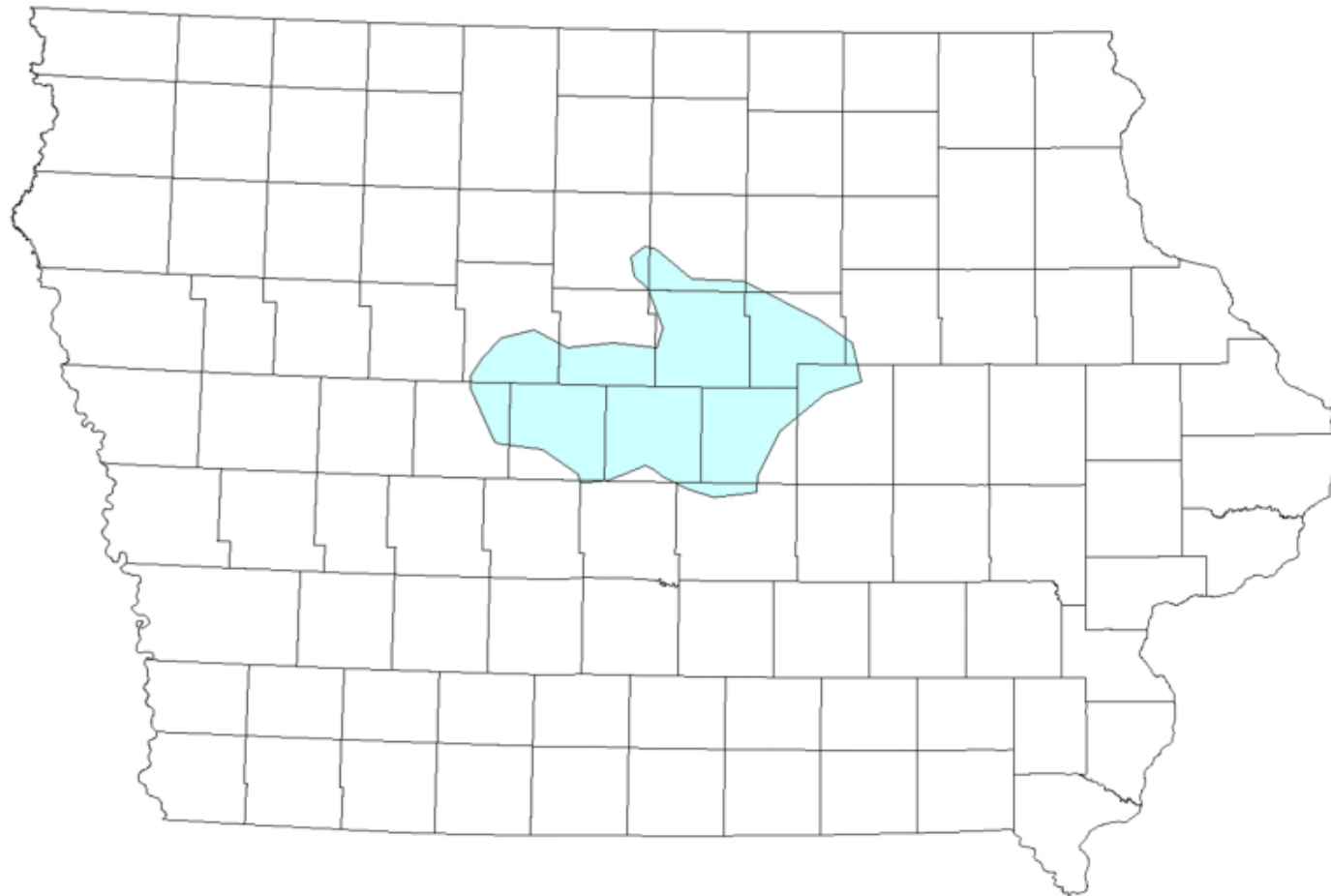
# Toledo – Belle Plaine – Williamsburg Area

- 118 miles rebuilt, 3 miles remaining
  - 98% rebuilds complete
- 1 new 69 kV circuit converted, 14 remaining
  - 6% conversions complete
- Upcoming Area Projects:
  - Johnson – Frytown - Parnell Conversion
  - Iowa Junction – Kalona Koe – Frytown Conversion
- Future Area Retirements:
  - 70 miles of 34.5 kV line to be retired
  - 3 substation retirements, 6 partial substation retirements



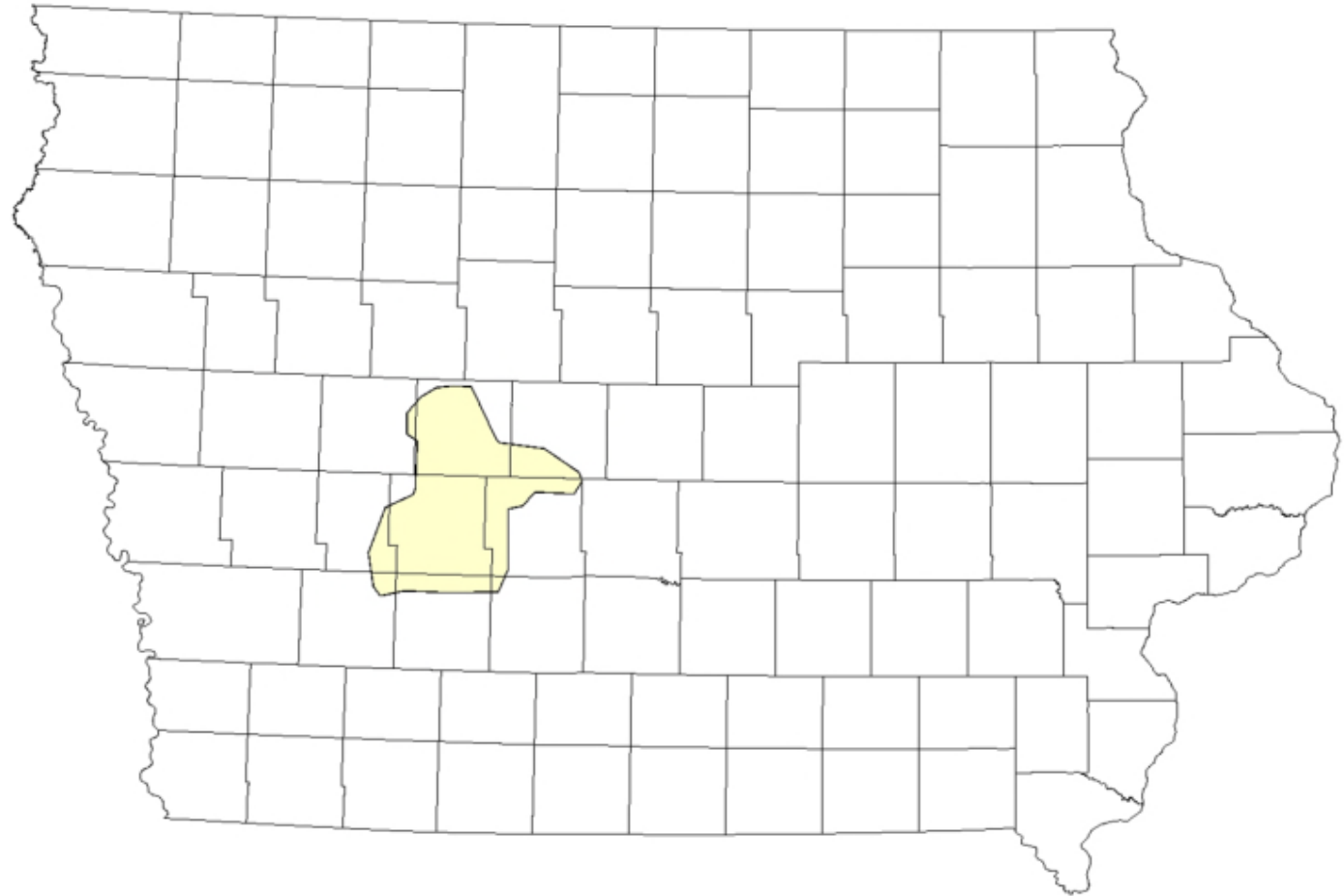
# Grand Junction – Ames – Marshalltown Area

- All 133 miles rebuilt
- 8 new 69 kV circuits converted, 7 remaining
  - 53% conversions complete
- Upcoming Area Projects:
  - Fletcher – Garwin Rd – Union Conversion
  - Ames - Fletcher Conversion
  - Grand Junction – Boone Quartz Conversion
- Future Area Retirements:
  - 27 miles of 34.5 kV line to be retired
  - 5 substation retirements, 5 partial substation retirements



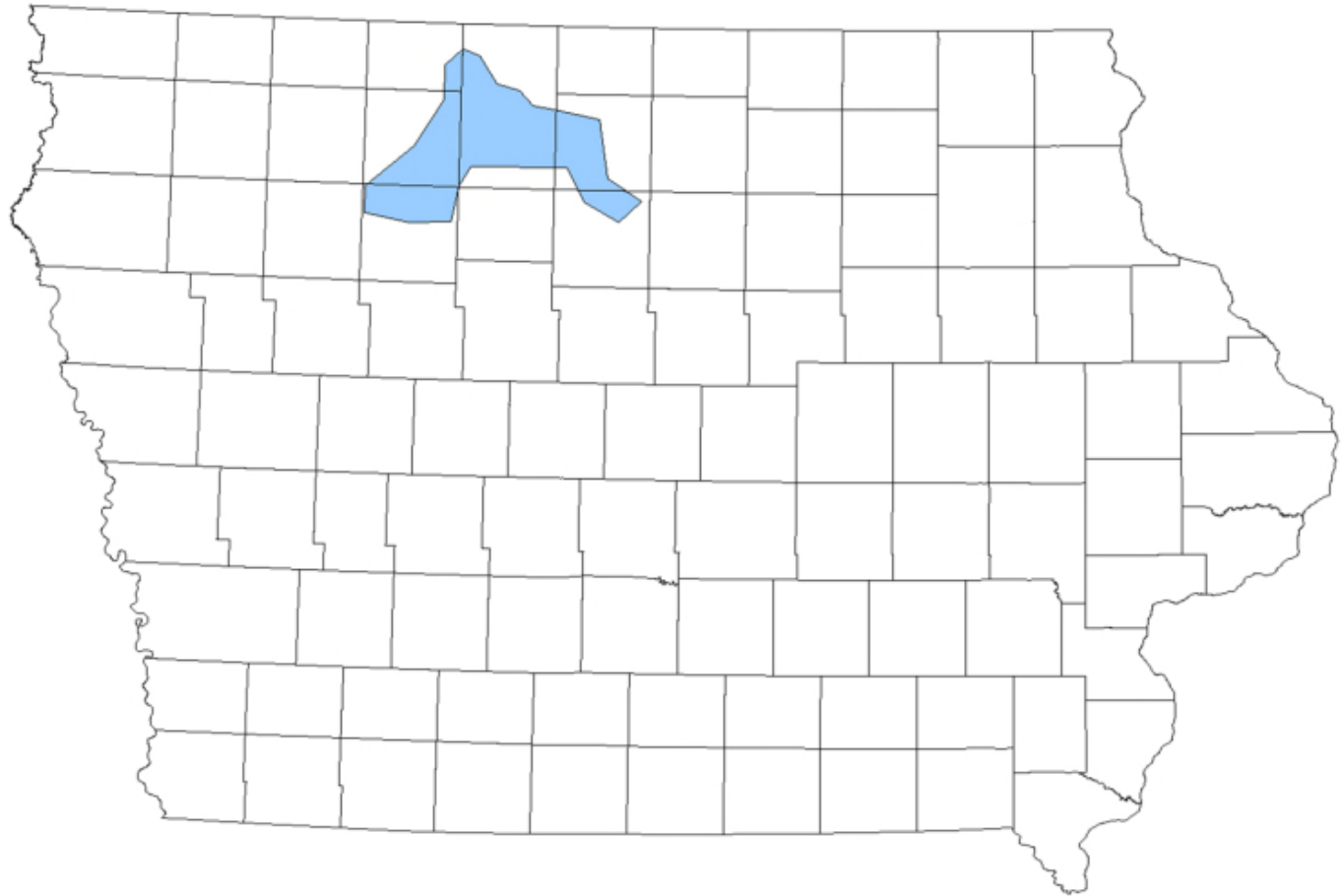
# Anita – Grand Junction Area

- All 116 miles rebuilt
- All 9 69 kV circuits converted
  - 100% conversions complete



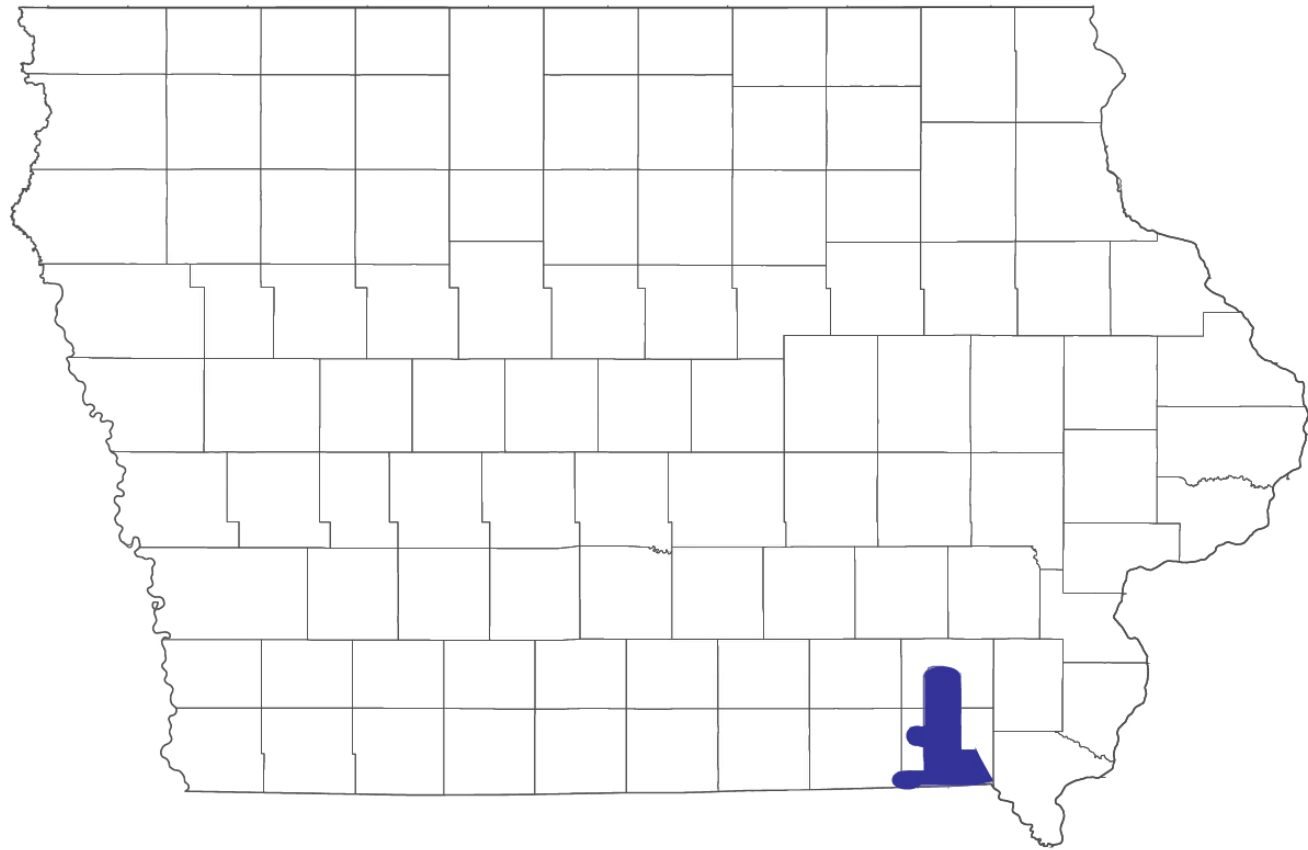
# Northwest Iowa Area

- Current plans provided to ITC indicate that IPL will be moving their load from ITC owned 34.5 kV system onto Corn Belt's existing 69 kV system in the area
- 1 substation retirement completed
- 40 miles of 34.5 kV line retired/sold to IPL to be used as distribution line
- Future Area Retirements:
  - 70 miles of 34.5 kV line to be retired
  - 3 substation retirements



# Fairfield Area

- Current plans provided to ITC indicate IPL will purchase the 34.5 kV lines to be used as distribution lines to serve area load
- Future Area Retirements:
  - 40 miles of 34.5 kV line to be retired/sold to IPL for use as distribution
  - 2 substation retirements
- ITC works with local distribution companies to re-use facilities such as poles and/or entire line sections no longer needed by ITC to help control costs for all parties





# Questions?



**Robert Walter**

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# Closing



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*Manager, Customer & Business Solutions*  
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# Meeting Feedback

We value your thoughts on how we can continue to improve these meetings.

Please visit: <https://forms.office.com/r/LnYBVdQrcs> or scan this code to find a quick and anonymous evaluation.



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***Casey Woodside***

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# Our Next Meeting

## ITC Midwest 2025 Spring Partners in Business

- Date to be determined

# Thank You for Attending!

Copies of today's presentation are available at:

<https://www.itc-holdings.com/itc-midwest/customer-solutions/partners-in-business/>

<http://www.oasis.oati.com/ITCM/index.html>

**Please leave your nametag on your table before you leave. Thank you!**

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A blue-tinted landscape photograph of a field with a utility pole and a dark blue banner with white text. The scene shows a utility pole on the left, a field of crops in the foreground, and a line of trees and buildings in the distance under a cloudy sky. A dark blue banner with white text is overlaid on the right side of the image.

**Enjoy the fall season!**



# Appendix



# Federal Regulatory Update



**FOR THE GREATER GRID**

# FERC Commissioners



# FERC



**Chairman Willie Phillips (D)**  
Term Expires 6/30/2026



**Commissioner Mark Christie (R)**  
Term Expires 6/30/2025



**Commissioner David Rosner (D)**  
Term Expires 6/30/2027



**Commissioner Lindsay See (R)**  
Term Expires 6/30/2028



**Commissioner Judy Chang (D)**  
Term Expires 6/30/2029

# Current Landscape and Priorities



- As the 2024 election looms, transmission policy has remained a top priority for the Commission all year
- Chairman Phillips' keen on sticking to his “Three-Legged Stool” of priorities:
  - Reliability
  - Affordability
  - Sustainability

# Order 1920 – Transmission Planning and Cost Allocation

FERC issued landmark Order 1920 in May 2024, which represented the most comprehensive transmission planning reform in over a decade:

- Requirements for long-term, scenario-based transmission planning
- Encouraged involvement from state regulators in cost allocation discussions
- Reinstatement of federal ROFR for “right-sized” transmission facilities
- Mandated consideration of advanced technologies in regional planning
- Enhanced transparency for local planning processes
- Improved coordination and communication of information regarding interregional planning

## Order 1920 – Cont.

- Parties submitted requests for rehearing in June 2024, and some have also appealed the order to the Courts for further review of FERC’s actions
- RTOs are working towards compliance by June 2025; however, FERC still needs to substantively address rehearing requests, and the appeals process will need to play out



# What's Next? Near-term FERC Priorities

**With generator interconnection reform (Order 2023) and transmission planning and cost allocation reform (Order 1920) now tackled, FERC is turning its sights to:**

## Return on Equity policy (Q4 2024)

- After years of litigation and uncertainty surrounding the existing policy, FERC General Counsel has indicated the Commission is planning to address ROE methodology in Q4 of this year

## Show Cause Orders on Self Funding (June 2024)

- On June 14, 2024, FERC issued “Show-Cause” Orders for MISO, SPP, PJM, and ISO-NE alleging the practice of allowing transmission owners the right to unilaterally elect self-funding for interconnection-related network upgrades may be unjust and unreasonable

# Other Open Proceedings

## Minimum Interregional Transfer Capability (February 2023)

- FERC held a technical conference in December 2022 to discuss interregional transmission, specifically interregional transfer capability between regions
- NERC is publishing a study in December 2024 that will inform FERC's efforts

## Advance NOPR on Dynamic Line Ratings (June 2024)

- Explores the application of dynamic line ratings on transmission lines to account for solar heating and wind cooling on transmission lines
- Comments are due in October and reply comments are due in November 2024

## Co-location of Large Loads at Generating Facilities (November 2024)

- FERC has scheduled a technical conference on November 1 to explore issues related to the co-location of large loads at generating facilities

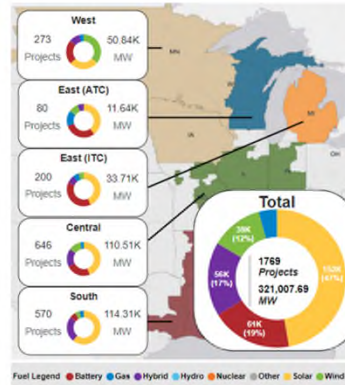
# Interconnection Update

\*Presented as handout at in-person meetings

PARTNERS IN BUSINESS | FALL 2024

## GENERATOR INTERCONNECTION QUEUE UPDATE

ITC MIDWEST



Fuel Legend: Battery Gas Hybrid Hydro Nuclear Other Solar Wind

<https://cdn.misoenergy.org/GI/20Web/20Overview272699.pdf>

The MISO Generator Interconnection Queue continues to experience delays due to the volume of requests and complexities of necessary mitigations. Long lead equipment such as circuit breakers further extend the timelines post GIA to interconnect generation.

Interconnection Customers desiring a sooner in-service and commercial operation date have options available to advance their timelines without waiting for the DPP cycle study completion, including:

### ENGINEERING & PROCUREMENT AGREEMENT

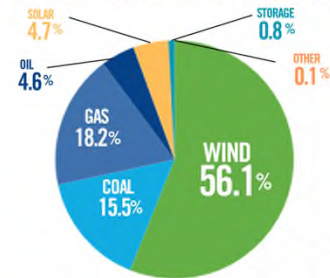
This allows detailed design to begin and long lead equipment items to be ordered prior to GIA execution. Construction does not begin under an E & P.

### PROVISIONAL GIA

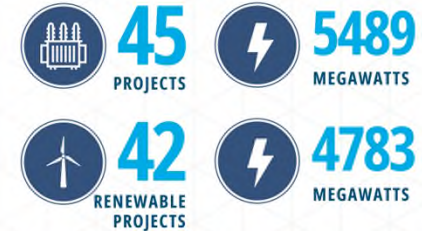
This form of GIA allows the project to advance prior to completion of the DPP system impact study including construction of the interconnection facilities. The project assumes responsibility for Network Upgrades yet to be identified in the DPP system impact study.

STUDY CYCLE	STUDY STATUS	# PROJECTS	MEGAWATTS REMAINING	NEW STATIONS	EXISTING STATION EXPANSIONS	INTERCONNECTION FACILITY STUDIES	EXPECTED GIA EXECUTION
ITC MIDWEST DPP 2020 WEST	GIA PHASE	4	585	0	4	COMPLETE	3 COMPLETE, 1 PENDING PGIA + GIA
ITC MIDWEST DPP 2021 WEST	PHASE 2	15	2196	1	7	COMPLETE	Q1/Q2 2025
ITC MIDWEST DPP 2022 WEST	PHASE 1	27	4796	8	19	Q1/Q2 2025	Q3/Q4 2025
ITC MIDWEST DPP 2023 WEST	SCOPING	11	1682	5	6	Q3 2025	Q1/Q2 2026

### GENERATING CAPACITY BY FUEL TYPE



### GENERATOR INTERCONNECTION PROJECTS CONNECTED BY ITC MIDWEST



Based on ITC Midwest interconnection facilities constructed, the generator itself may not have yet achieved COD.