2024 10-Year Assessment Preliminary Study Design

Stakeholder and Customer Webcast

PRESENTED BY:

System Planning

November 13, 2023

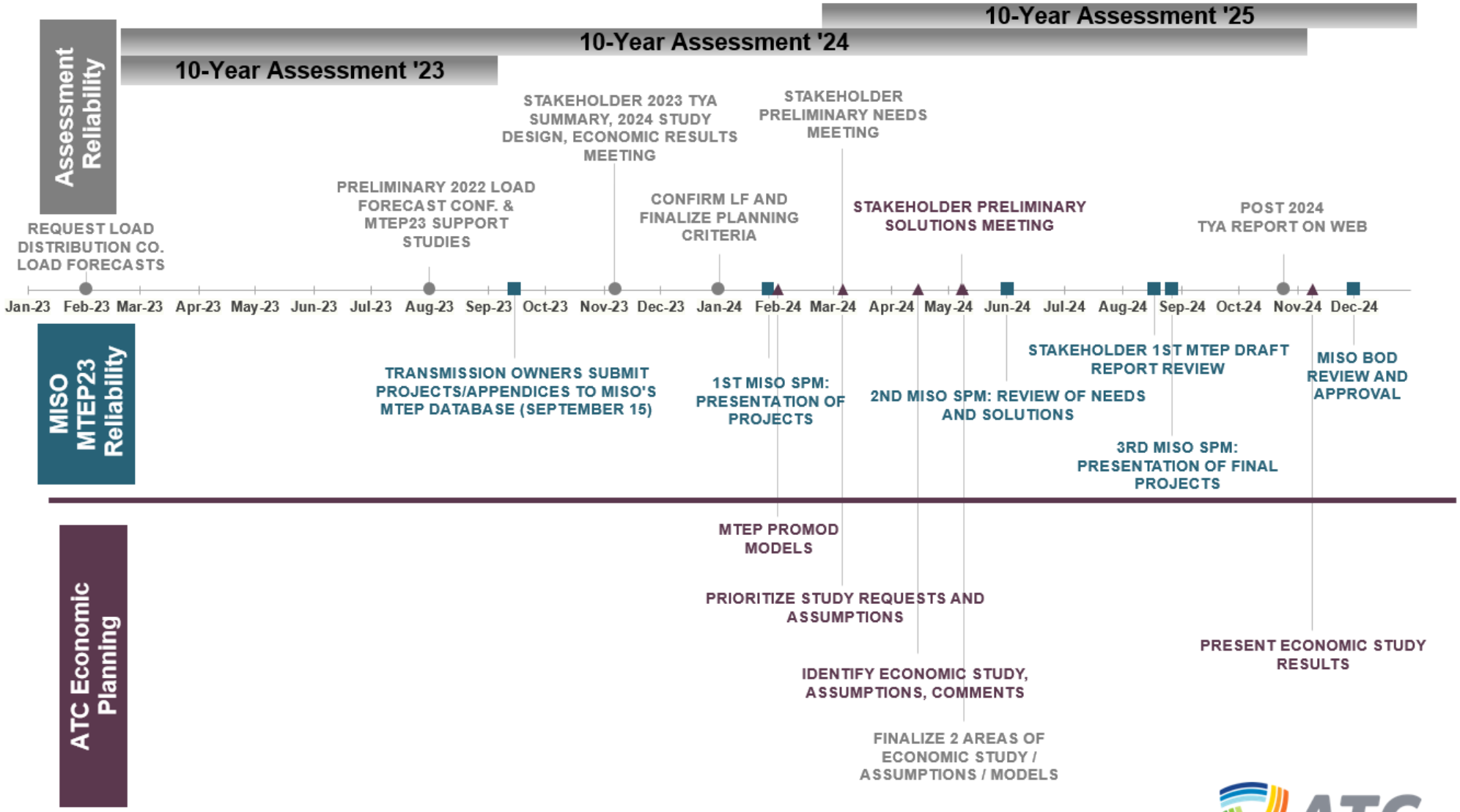
Purpose

- Summarize ATC's project development processes
- Solicit input for the 2024 Assessment Study Design
- Solicit input on any new Public Policy Requirements

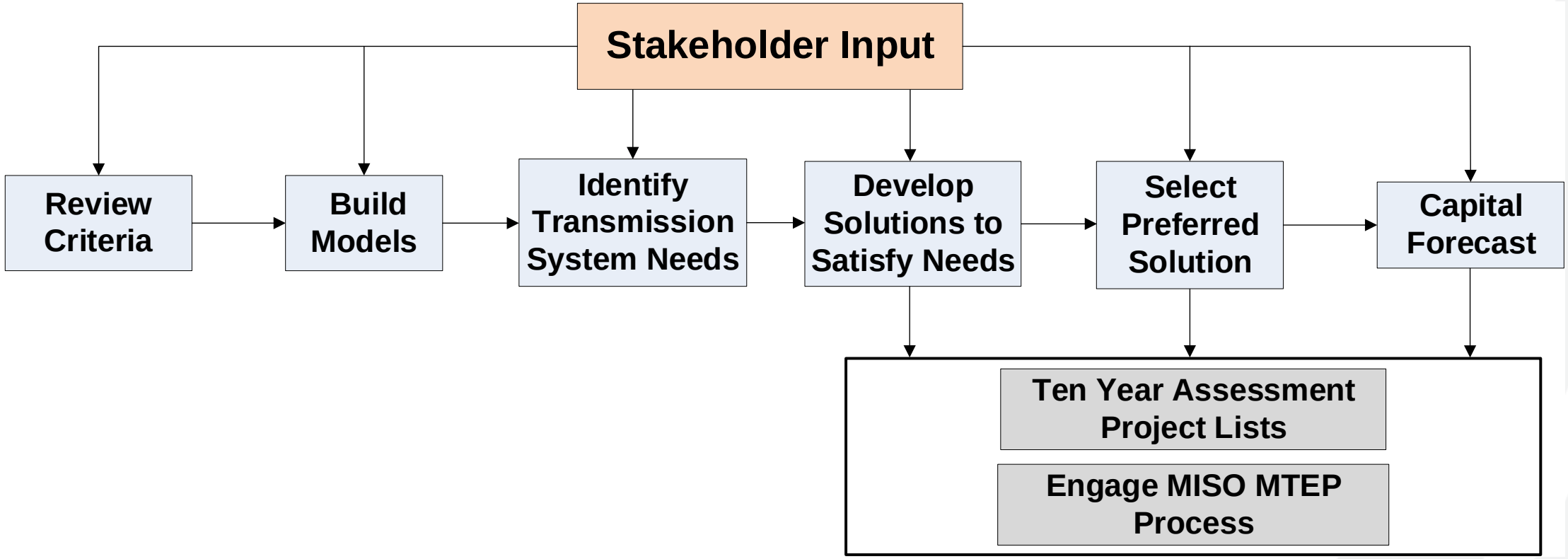
ATC's project development processes

- Local Transmission Planning
  - Asset Renewal
  - Interconnections
  - Network
    - Planning Reliability Criteria
    - Sectionalizing Guidelines
  - Economic Benefits
- Consider Other Solutions (Non-Transmission Alternatives)
- Regional Planning
- Public Policy Requirements

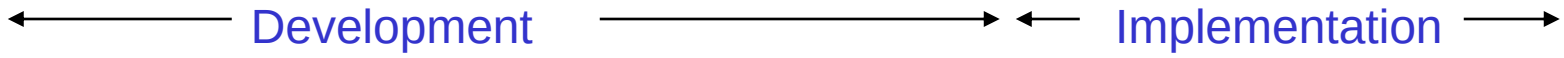
Timeline



ATC project identification process



ATC project status definitions



Strategic

Provisional

Proposed

Planned

In-Service

Asset renewal program objectives

- Safety – public and worker
- Minimize total life cycle cost [Net Present Value of Revenue Requirements (NPV RR) from customer cost/rate perspective]
- Compliance
- Manage risk
- Reliable performance – maintain or improvement
- Environmental performance improvements
- Coordination with Stakeholders

Replacement is based on...

- Safety – public and worker
- Condition – tests, maintenance costs/risks
- Obsolescence – part availability, factory support, craft labor expertise with this specific equipment, available spares
- Utilization – application, system changes
- Criticality – consequence of failure, outage impacts
- Costs – maintenance and replacement
- Environmental – PCB contamination, oil volumes and containment, proximity to waterways, SF6 gas leaks, lead, mercury, environmental compliance/risks
- Compliance – NERC, CIP, EPA, State DNR
- Other Considerations – test frequency, on-line monitoring, test information available, fleet size, common fleet issues, maintenance history, failure mode, industry experience

Asset renewal considerations

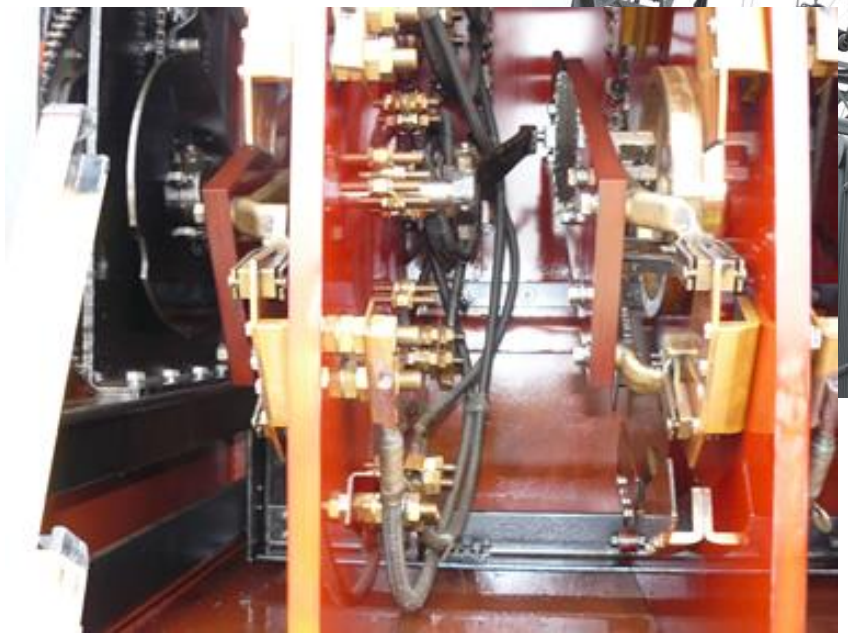
- Is the asset still needed?
  - Assess area needs
  - Obtain cross-functional and distribution provider input
  - Consider removal of lines/equipment
  - Consider system reconfiguration
  - Other alternatives
- What ratings and performance are needed?

Asset Renewal T-line Project Example

- Portage – Dam Heights 69kV Rebuild (Y-16)
  - Project Background
    - Approximately 25 of miles of rebuild
  - Past Needs
    - Condition and Performance Issues
    - Replace 1910's vintage lattice structures
    - Outages: One of the most frequently outaged ATC lines
      - ✓ On average about 4 outages per year
      - ✓ Updated to avian friendly design
      - ✓ Improved lightning performance
  - Current status
    - Project went in-service Fall of 2017
    - Improvement in performance: One momentary outage in 2021 due to lightning above design (69kV – 45kA design, actual strike 192kA)

Lancaster Power Transformer – Life Cycle

- Allis Chalmers Power Transformer built in 1954
- Life Extension – 2015
  - High Voltage Bushings
  - Load Tap Changer bypass
  - Oil Seal Gaskets
- Planned Retirement 2025 after LDC distribution buildout



Interconnections

- G-T
  - MISO Attachment X and Y Processes
- D-T
  - Collaborate with distribution providers through Load Interconnection Request Form (LIRF) and BVP process
- T-T
  - Collaborate with other Transmission Owners

Network planning objectives

- Compliance with North American Electric Reliability Corporation (NERC) regional and local criteria
- Best Value Planning (BVP) process
- Customer involvement
- Address Public Policy requirements
- Maintain or improve the adequacy and reliability of the electric transmission system

Planning Criteria and Assessment Practices

- NERC Standards, particularly TPL-001, Version 5
- ATC Planning Criteria
  - Consists of criteria and assessment practices
  - http://www.atc10yearplan.com (About tab)
  - Current versions: Planning Criteria v22.2 & Planning Assessment Practices v22.2
  - Planning Criteria v22.2
    - v22.2 (March 2023)
      - ✓ IBR Model Verification Process Update to Section 4
  - Planning Assessment Practices v22.2
    - v22.2 (March 2023)
      - ✓ Included a generator outlet emergency rating requirement in Section 13.6.1
      - ✓ Included a requirement of interconnection customers using ATC Area Generator Material Modification Study Review Template when submitting a generator material modification study in Section 13.8.

2023 studies and assumptions

- Preliminary 2023 Load Forecast Confirmation and MTEP24 Support Studies
- Modeling Assumptions
  - Model Years
  - Load
  - Generation
  - No Load Loss Allowed Contingency Analysis
- Additional Studies

Preliminary load forecast and MTEP24 support studies

- Initial screening (reduced generator reactive capability)
  - Summer peak (5 and 10 year models)
  - 2023 load forecast
  - 2023 TYA outside world (2022 MMWG cases)

- To confirm 2023 Load Forecast and support MTEP24 database development
  - No load loss allowed contingencies
  - Completed August 2023

2024 TYA model years

- 2024 (As-planned)
- 2025
- 2029
- 2034

- All models will likely be completed by the Spring of 2024

2023 Load Forecast- Historical

- Requested September 29, 2023
  - ATC's 2023 summer peak hour
  - ATC's 2022-2023 winter peak hour
  - Light load
  - Shoulder load

- Requested by November 1, 2023.

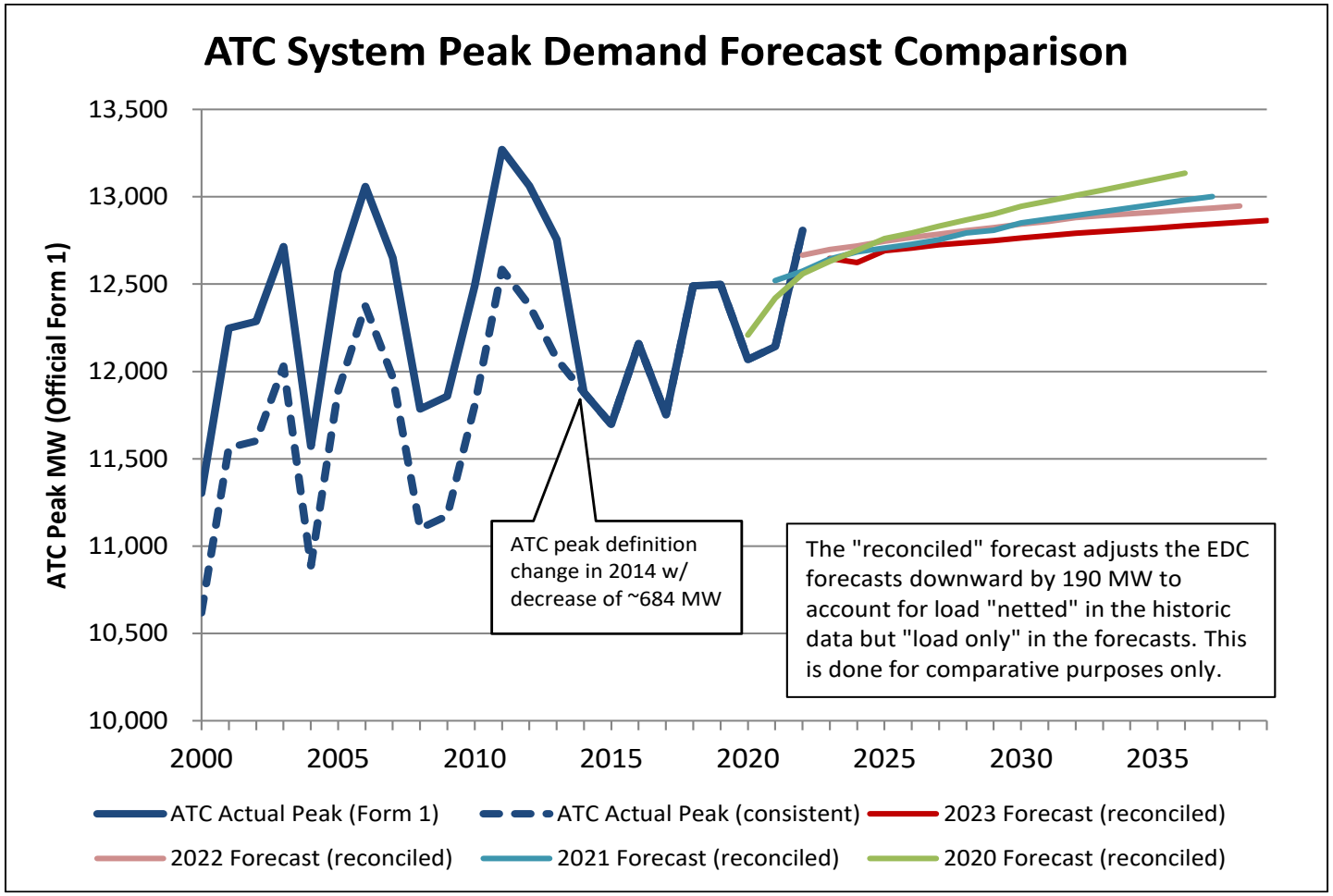
- Compile, review, and add to the existing load databases

2023 Expected forecast for TYA 2023

- Requested LDC forecasts in February 2023
  - 11 years per D-T IA
  - Consistent with resource planning forecast
  - Expected (50/50 probability)
- Received in April 2023
- ATC compares forecasts to previous forecasts and historic data
  - Notable differences are confirmed with the LDCs and revised if needed
  - Finalized copy of forecast provided to LDCs in August 2023
  - Forecasts incorporated into the 2024 TYA to plan the system

ATC 2023 Load Forecast Comparison

Comparisons of ATC TYA Forecasts



Annual growth rates
(2023-2033 for all)

2020 Forecast: 0.35%
2021 Forecast: 0.25%
2022 Forecast: 0.15%
2023 Forecast: 0.11%

ATC Load Forecast Growth by Zone
2023-2033 Annual Growth Rates

	Forecast Year			
Zone	2023	2022	2021	2020
Zone 1	0.1%	0.2%	0.3%	0.4%
Zone 2	0.7%	0.4%	0.2%	0.3%
Zone 3	0.2%	0.3%	0.3%	0.5%
Zone 4	0.0%	0.0%	0.1%	0.2%
Zone 5*	0.1%	0.1%	0.2%	0.3%
ATC Total	0.11%	0.15%	0.21%	0.32%

*Zone 5 influenced by Racine County growth.

Load forecast trends, (*Continued)*

Model	ATC Load (MW)		
	2021 Assessment	2022 Assessment	2023 Assessment
Year 1 Summer Peak	12,700	12,800	12900
Year 5 Summer Peak	+300	+100	+100
Year 10 Summer Peak	+400	+300	+200
Year 5 Shoulder	9,300	9,100	9200
Year 10 Shoulder	+200	+100	+100

Generation modeling

- Existing generator data
  - Annual updates requested from Generator Owners (GOs) in Q3
- Generation additions
  - Only add generators with signed interconnection agreements (IAs)
  - Additions modeled at MISO Facility study location
- Generation retirements
  - Generators with a completed MISO Attachment Y are modeled as retired, unless there is a System Support Resource (SSR) agreement
- Under intact system and outage conditions
  - Generators are limited to:
    - 90% of maximum reactive power output and
    - 90% of maximum reactive power consumption

Generation dispatch

- Local Balancing Area (LBA) merit order dispatch:
  - Used in Assessment's summer peak and shoulder models.
  - Provided by LBAs
- ATC-wide merit order dispatch:
  - Used in minimum load models
  - ATC-wide merit order dispatch determined using PROMOD
- Generators without scheduled transactions:
  - If they have signed IAs, generator included in the host LBA.

No load loss allowed contingency analysis

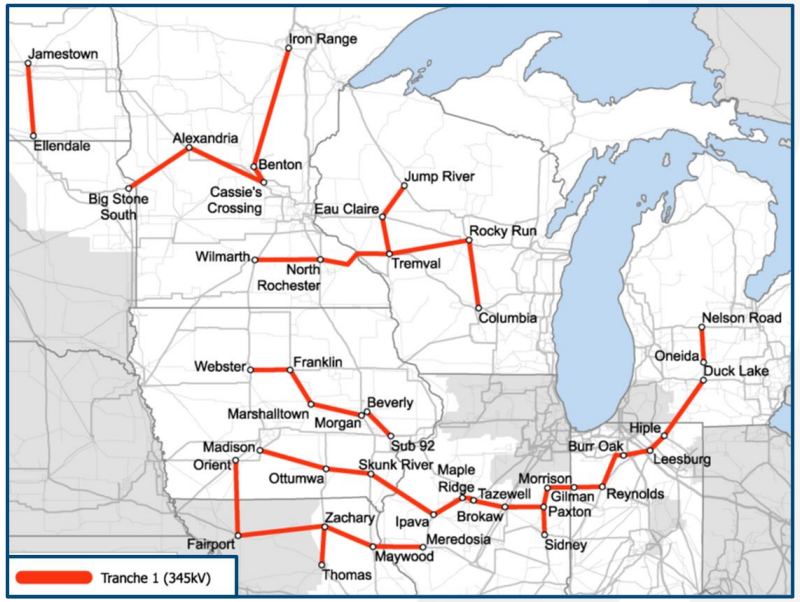
- Peak
  - 1, 5, and 10 year out models
- Shoulder (firm)
  - 5 and 10 year out models
  - 70% load except for Zone 2 (90% load) and northern Zone 4 (80% load)
  - Shoulder rating methodology
- Minimum load
  - 1 and 5 year out model
  - 40% load, may be adjusted based on analysis of historical loads

Additional network planning studies

- Load Loss Allowed
- Existing Generator Stability Reviews
- Annual Fault Study
- Sensitivity Studies

Long Range Transmission Plan (LRTP)

- MISO led initiative, under the Reliability Imperative
  - Transmission solutions to provide reliable and economic energy delivery for a reliable energy future
- 4 Tranches planned
  - Tranche 1
    - Approved by the MISO Board retroactively to MTEP21 in 2022
    - Portfolio of 18 projects for $10.3 B
    - ATC ownership share in 3 projects
  - Tranche 2
    - Under development and study, ATC actively participating
- Latest information available at [MISO's LRTP Page]



Projects Flow from the TYA to MTEP

- Projects developed in the 2023 TYA process will be included in the MTEP24 approval process
  - A list of those projects can be found in the 2023 TYA Project List
- Projects that may develop subsequent to the 2023 TYA process would be included on the project list and will be submitted into MTEP24
- MISO Active Project List

MTEP24 – Summary (as of 10/27/23)

- Appendix A Projects
  - Count: 15
  - Est Cost: $504,400,000
- Appendix B Project
  - Count: 34
  - Est Cost: $1,051,200,000
- Remaining Appendix B Projects
  - Count: 17
  - Est Cost: $484,600,000

MTEP24 Appendix A
Project Breakdown

Project Category	Count
Baseline Reliability Project	0
Generator Interconnection Project	0
Other – Local Reliability	4
Other – Age and Condition	3
Other – Load Growth	5
Other – Other Local Need	3
Total	**15**

Non-Transmission Alternatives (NTAs)

- ATC and MISO work together in the TYA and MTEP processes to provide Stakeholders an opportunity to provide NTA Feedback on Projects
- MISO will post a list of NTA eligible projects as part of their Subregional Planning Meeting (SPM) #1, in January of 2024.
  - MISO will accept stakeholder project alternatives through May 31, 2024.
  - Best candidates for NTA consideration are MTEP Appendix B and Target Appendix B projects.
  - Stakeholders should submit alternatives to MISO's MTEP SPM contact, who is Greg Plauck.

Regional planning

- MTEP
- MISO's Coordinated Seasonal Assessments
- Reliability First's (RF's) Seasonal Assessments

Public policy requirements

- Follow MISO Tariff (Attachment FF) Processes
- Previously identified requirements
  - State Renewable Portfolio Standards (RPSs)
  - EPA regulations
  - State mandates and goals for energy efficiency (EE) and demand side management (DSM) programs
- We are asking for any feedback on whether there are additional public policy requirements we need to be made aware of.

Schedule

- Expected Load Forecast – Review complete August 2023
- Preliminary MTEP23 Support Study – Done
- Post 2023 TYA Preliminary Study Design Presentation – Done
- Stakeholder Preliminary Study Design Meeting – November 13, 2023
- Stakeholder Study Design Comments Due – November 30, 2023
- Study Design Completion – December 2023
- Preliminary Needs Meeting – March 2024
- Preliminary Solutions Meeting – May 2024
- Document and Publish – November 2024

Thank you for participating

To provide solicited comments or for more information, please contact:

Ted Weber (tweber2@atcllc.com)

by November 30, 2023