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2017 Economic Planning Study Kickoff

Erik Winsand, ATC Economic Planning

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Introduction

- Process Overview and Timeline
- 2017 Futures Development
  - Historical Process
  - Proposed Process
  - Matching ATC Study Timeline to MISO Timeline
- Next Steps

2017 Futures Development

- Utilize the MISO MTEP models and futures
- Review MISO models and provide updates as necessary
- Ensures greater alignment with MISO stakeholder process

ATC Process Overview and Timeline

- ATC Economic Project Planning – Per ATC Tariff
  - **During February,** we hold an initial stakeholder meeting to review the market congestion summary and potential fixes and to discuss economic study scenarios, drivers, ranges, and assumptions.
  - **By March 1**, we work with stakeholders to request and prioritize new/other economic studies and recommend study assumptions.
  - **By April 15 –** we identify preliminary areas of economic study, study assumptions and models and solicit further comments from stakeholders.
  - **By May 15 –** we finalize areas of economic study, study assumptions and models to be used in analysis.
  - **By November 15 –** we provide a summary of the results of the economic analyses to our stakeholders.

MISO MTEP17 Futures

- Existing Fleet – (EF)
- Policy Regulations – (PR)
- Accelerated Alternative Technologies – (AAT)

Existing Fleet

- Largely unchanged generation fleet
- Lower demand and energy growth rates
- No carbon emission regulations
- Age related coal retirements
- Renewable investment based on RPS and economics
- Lower fuel costs

Policy Regulations

- Policy/Regulation targeting reduction in CO^2 emissions
- CO^2 reduction goal set at 25% lower than 2005 levels
- Mid level demand and energy growth rates
- Return to mid level fuel prices
- Increased retirement of coal to meet CO^2 target
- Assume decreasing capital costs of renewables

Accelerated Alternative Techonologies

- Policy/Regulation targeting reduction in CO^2 emissions
- CO^2 reduction goal set at 35% lower than 2005 levels
- Increased demand on NG drives prices higher
- Increased retirement of coal to meet CO^2 target
- Robust economy drives more technology advancement, resulting in more energy efficiency, distributed generation, and demand response
- Higher gross demand and energy, offset by tech advancement

MISO MTEP17 Key Assumptions

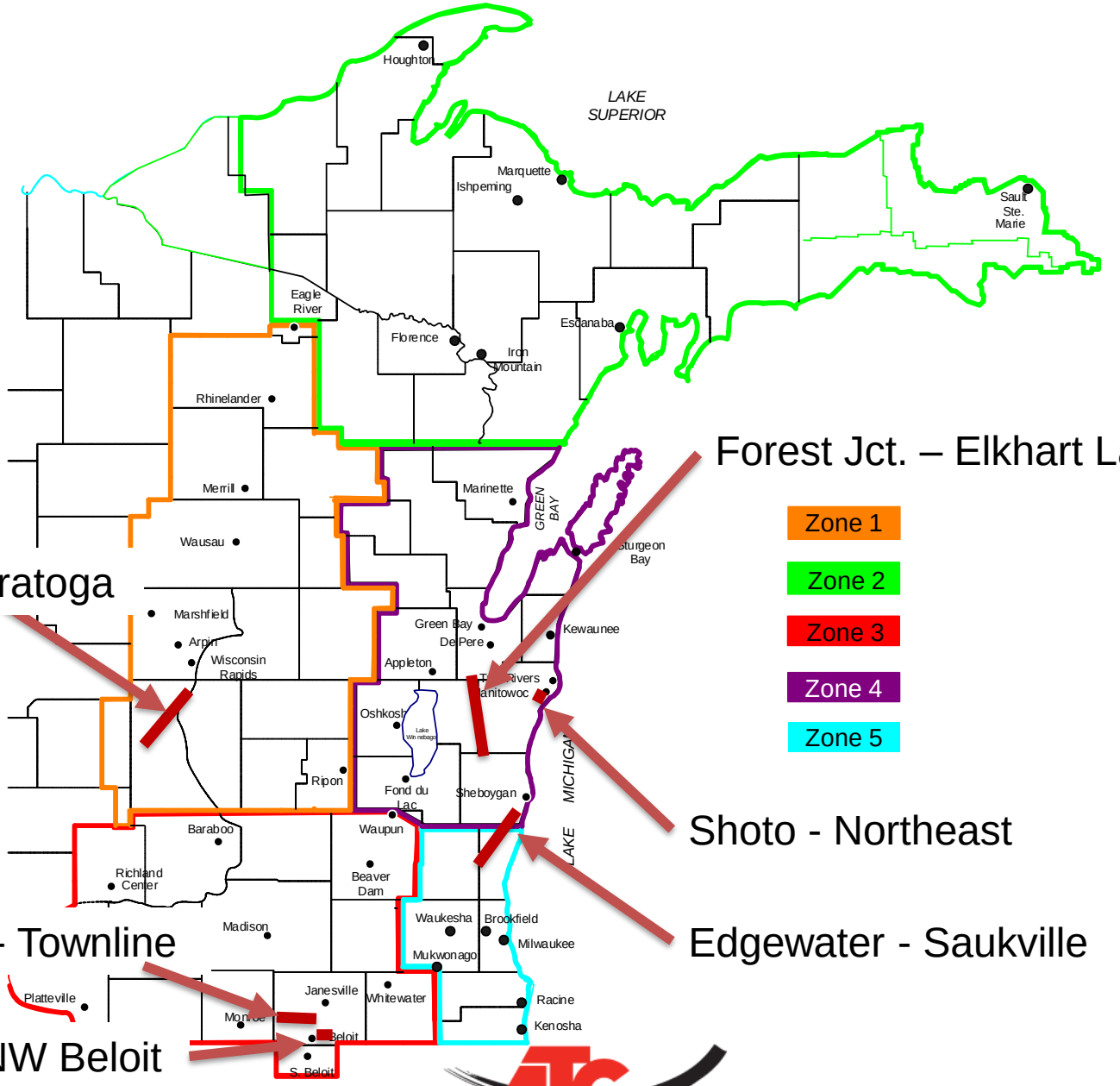
Future	Existing Fleet	Policy Regulations	Accelerated Alternative Technologies
Net Demand & Energy Growth Rates	Demand: 0.4%[1] Energy: 0.4%[1]	Demand: 0.5%[1] Energy: 0.5%[1]	Demand: 0.6%[1] Energy: 0.6%[1]
Natural Gas Price Forecast	Low	Mid	High
Max DR/EE/DG Tech Potential	DR: 8 GW EE: 9.6 GW DG: 2.3 GW	DR: 9 GW EE: 10.8 GW DG: 2.8 GW	DR: 12.1 GW EE: 25.6 GW DG: 6.4 GW
Retirement	Coal: 9 GW Gas/Oil: 17 GW Total by 2031: 25 GW	Coal: 16 GW Gas/Oil: 17 GW Total by 2031: 33 GW	Coal: 24 GW Gas/Oil: 17 GW Total by 2031: 41 GW
Renewables	Mandates + Goals	Mandates + Goals + maturity cost curve	Mandates + Goals + maturity cost curve
MISO System CO2 Reduction Target	N/A	25% of 2005 levels	35% of 2005 levels

1. Net Demand and Energy Growth Rates Economic Development of Potential DR/EE/DG Tech. Gross Growth Rates are 0.4%, 0.6% and 0.9%

Source: MISO May, 18 2016 Planning Advisory Committee (https://www.misoenergy.org/Events/Pages/PAC20160518.aspx)

Notable MTEP17 Congestion

- Paddock – NW Beloit 138 kV
- Forest Junction – Elkhart Lake 138 kV
- Petenwell – Saratoga 138 kV
- Townline – Bass Creek 138 kV
- Edgewater – Saukville 138 kV
- Shoto – Northeast 69 kV



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Stakeholder and Customer Feedback

- ATC is soliciting stakeholders and customers for new/other economic studies, recommended study assumptions changes, and study areas for our 2017 study
- ATC also requests feedback in areas where Public Policy Requirements may drive transmission needs.
  - Public Policy Requirements are enacted statutes (i.e., passed by the legislature and signed by the executive) and regulations promulgated by a relevant jurisdiction, whether within a state or at the federal level, including duly enacted laws or regulations passed by a local governmental entity, such as a municipal or county government. Stakeholders are encouraged to provide ATC with Public Policy Requirements. ATC utilizes transmission needs driven by Public Policy Requirements in its assumptions when performing economic analysis of study areas. The transmission needs driven by Public Policy Requirements that will be included in ATC's finalized assumptions will be posted prior to May 15th.

Next Steps

- Project / Analysis Development
  - Review of Congestion
  - Investigate impacts of generation expansion and retirement on congestion
  - Stakeholder Feedback
- 2017 Futures Development
  - Continued Review of MISO MTEP17 Development
  - Review of MISO PROMOD Models
  - Update model with interconnection projects that may impact congestion
- Analysis of Projects
  - Study Years – 2026 and 2031
  - Futures – All MISO MTEP17 Futures
- Timelines
  - April 15: Define Preliminary Assumptions
  - May 15: Finalize Assumptions
  - November 15: Provide Analysis Update

Detailed MISO Futures Information

- MTEP17 Futures Development Summary
  - May Planning Advisory Presentation
- MTEP17 Resource Expansion and Siting Results
  - September Planning Advisory Presentation

Questions?

- ATC Economic Planning
- Dale Burmester
  - dburmester@atcllc.com
- Erik Winsand
  - ewinsand@atcllc.com

Thank You For Your Time!