2021 Economic Study Assumptions

PRESENTED BY

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AMERICAN TRANSMISSION COMPANY®

Introduction

- Process overview and timeline
- 2021 Economic Model Futures
- Study areas
- Next steps

ATC Process Overview

- Develop ATC economic models from MISO MTEP models
  - MTEP (MISO Transmission Expansion Plan)
  - Includes updates from stakeholders
- Analyze potential projects' economic benefit
- Report results to stakeholders
- Build economical best-value projects

ATC Process Timeline

- 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 MTEP21 Futures

Futures	1	2	3
Carbon Reduction Target (%)[1]	40	60	80
Carbon Reduction Acheived (%)[2]	63	64	81
Energy Supplied by Renewables (%)	26	32	50
20-Year Increase in Energy (%)[3]	10	24	40
20-Year Increase in Peak Demand (%)[3]	12	22	33

Current MISO Generating Capacity (GW)	184	184	184
Generation Retirements (GW)	-77	-80	-112
New Generation Added in MISO (GW)	130	169	343
Total Generation Net of Retirements (GW)	**237**	**273**	**415**
Generating Capacity in 20 Years Relative to Today[4]	1.3X	1.5X	2.3X

Notes to previous slide table

[1] Relative to 2005.

[2] Future 1 models 100% of the state-approved utility integrated resource plans (IRPs) and 85% of state and utility goals (e.g. carbon neutral by 2050) that are not legislated. This reduces carbon emissions more than setting a 40% carbon reduction target (in the EGEAS model). In other words, in Future 1, due to IRPs and state and utility goals, carbon declines by 63% rather

[3] **Annual net** energy and peak demand increases by 0.47, 1.08, 1.69% and 0.57, 0.98 and 1.43%, respectively, for each Future.

[4] Future 3 projects more than double (2.3X) today's amount of generating capacity in 20 years (415 versus 184 GW). Significant amounts of new transmission will be needed to deliver this variable largely renewable capacity to load. Fossil generators can have capacity factors as much as twice those of wind plants so to replace them you would need roughly twice as much wind capacity. Correspondingly, you would need roughly four times as much solar capacity. High performing wind and solar plants can have "capacity factors" in the range of 50% and 25%, repectively. A 50% capacity factors means that a 100 MW wind plant's average hourly output would be 50 MW. Hence the "Generation Increase Relative to the Current Amount" can be substantial. More renewable generation is also required because of its variable nature.

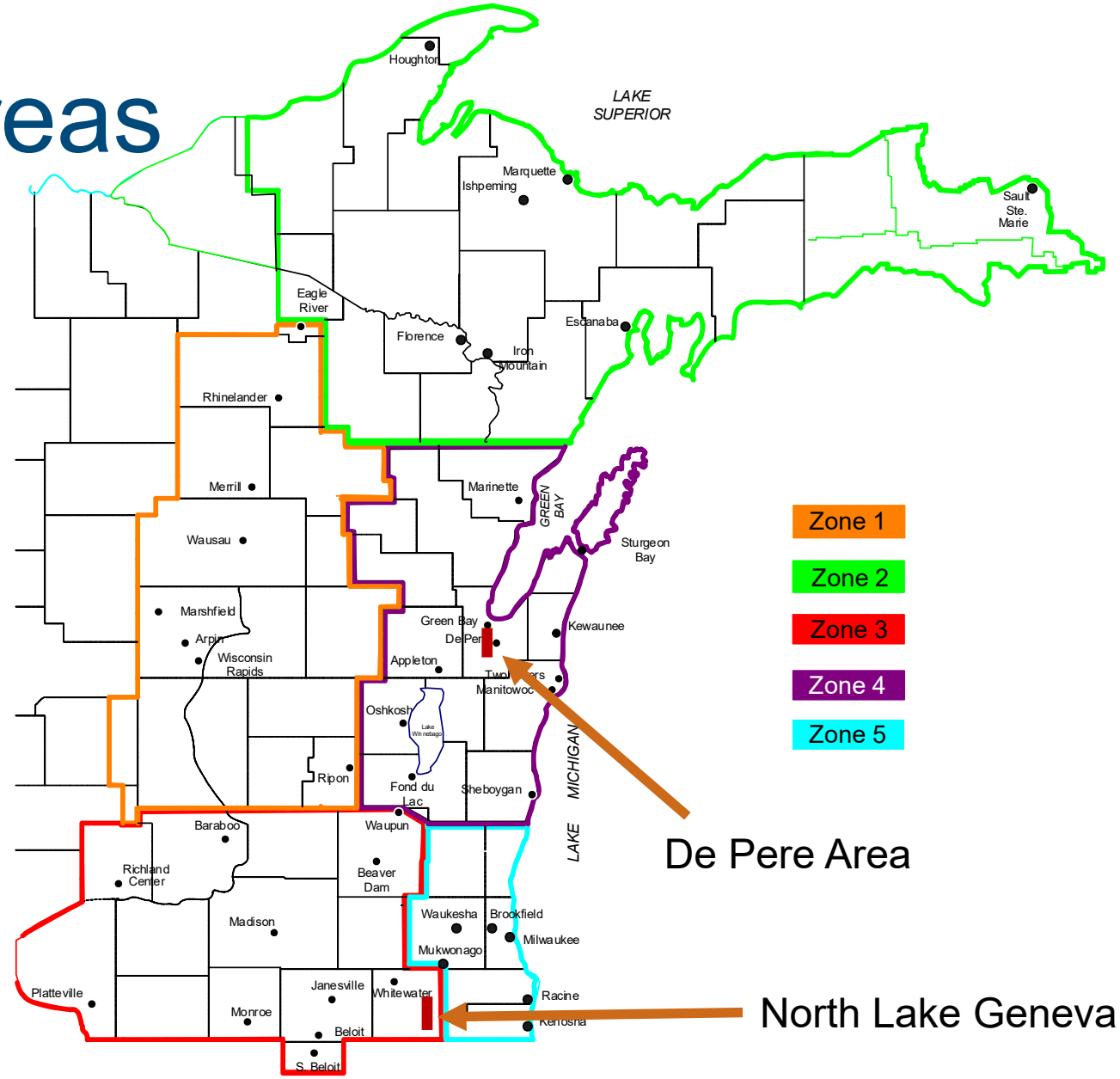
Notable MTEP21 F1 Congestion

Hours of Congestion					
		Year			
		2025	2030	2035	2040
Area	Granville – Tosa 138 kV	4	105	233	512
	Butler – Bluemound 138 kV	72	1486	828	218
	Concord – Crawfish River 138 kV	3	139	209	338
	North Lake Geneva Area (4 lines)	333	1944	1244	1268
	De Pere area (2 lines)	9	128	293	559
	Progress Ave – Aviation 138 kV	0	0	21	108
	Manitowoc Area (2 lines)	1	100	215	205

*Congestion data for futures F2 and F3 have not yet been released.

MTEP21 Study Areas

- North Lake Geneva Area
  - New generation changes may affect area
- De Pere Area



Next Steps

- 2021 Models Development
  - Update model with interconnection projects that may impact congestion
- Analysis of Projects
  - Study Years: 2025, 2030, 2035, 2040
  - Futures: All MTEP21 Futures
- November 15: Provide Analysis Update Summary

Questions?

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