Economic Planning Study Update

PRESENTED BY

Anna Torgerson, ATC Economic Planning

March 7, 2022

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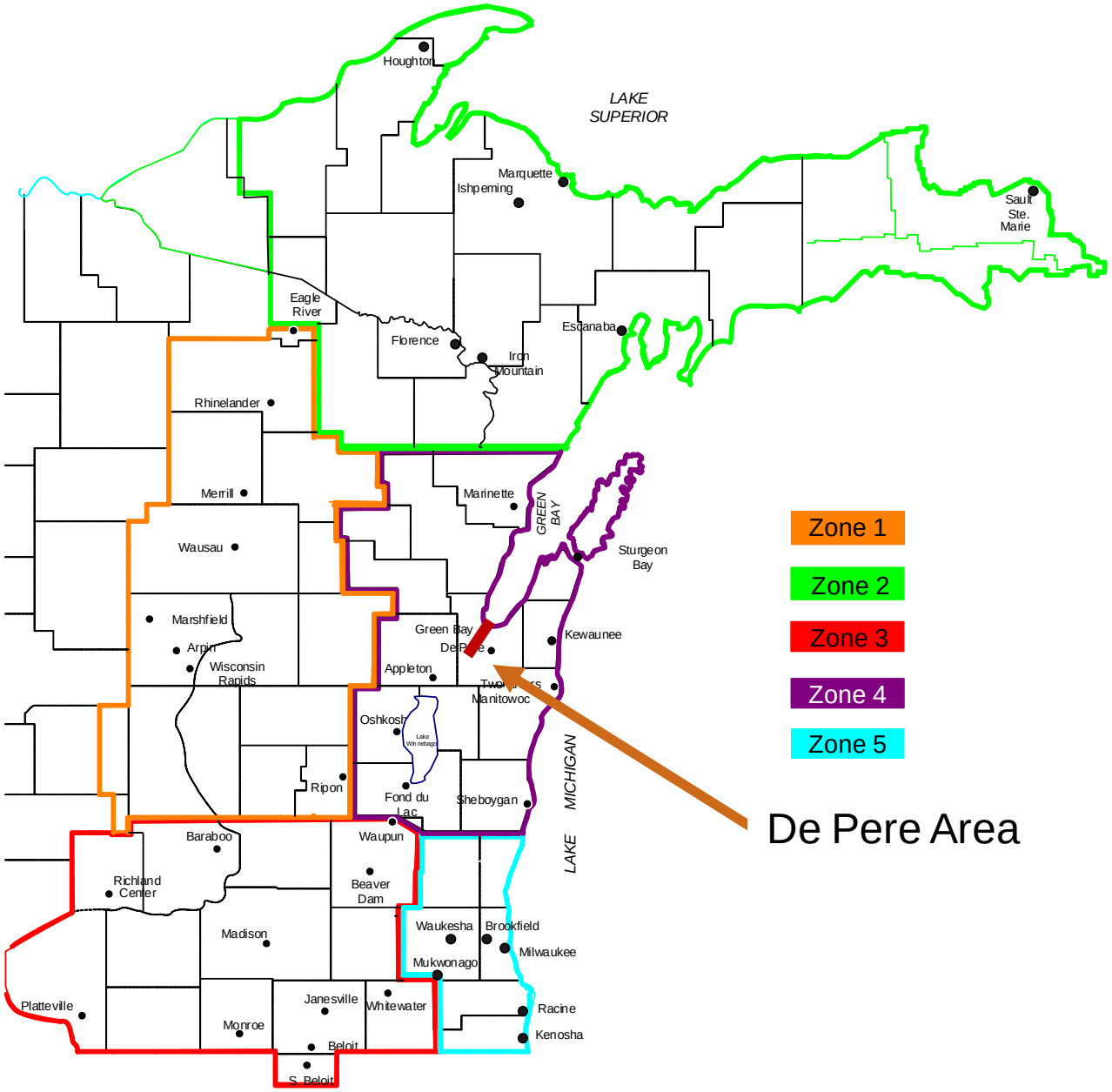
Houghton
LAKE SUPERIOR
Marquette
Ishpeming
Sault Ste. Marie
Eagle River
Florence
Escanaba
Iron Mountain
Rhinelander
Merrill
Marinette
GREEN BAY
Wausau
Sturgeon Bay
Marshfield
Green Bay
De Pere
Kewaunee
Arpin
Wisconsin Rapids
Appleton
Two Rivers
Manitowoc
Oshkosh
Lake Winnebago
Ripon
Fond du Lac
Sheboygan
MICHIGAN
LAKE
Baraboo
Waupun
Richland Center
Beaver Dam
Madison
Waukesha
Brookfield
Milwaukee
Mukwonago
Platteville
Janesville
Whitewater
Racine
Monroe
Kenosha
Beloit
S. Beloit
Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
De Pere Area

De Pere Alternatives

- **Energy Storage:** 25 MW and 25 MWH battery at Glory Road
- **Double Circuit:** Double circuit following lines
  - Lost Dauphin – Red Maple 138 kV
  - Red Maple – De Pere 138 kV
  - De Pere – Glory Road 138 kV
- **Series Reactor:** 5ohm series reactor on 138 kV De Pere – Glory Road
- **De Pere 69 kV:** Connect De Pere generation to 69 kV at Oak St.
  - Single 138/69 kV transformer and 0.2 mi of 69 kV line
- **T2-477 Rebuild:** Rebuild following lines to T2-477
  - Lost Dauphin – Red Maple 138 kV
  - Red Maple – De Pere 138 kV
  - De Pere – Glory Road 138 kV

De Pere Alternative Results

Alternative	MISO F1 Planning Future Benefit
Energy Storage	$928,599
Double Circuit	$14,681,367
Series Reactor	$112,594,118
De Pere 69 kV	$539,778
T2-477 Rebuild	$7,378,690

Above values are 40-year gross present-value benefits

Economic Planning Kickoff

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Introduction

- Process Overview and Timeline
- Models and Futures Development
- Stakeholder Input
- Next Steps

ATC Process Overview and Timeline

- **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.

Model Development

- Unknown Timeframe for releasing MTEP22 Models
  - Only MTEP21 F1 and F2 models have been released
- Utilize the MISO Transmission Expansion Plan (MTEP) 2021 models and futures
- If a project is developed in this process, then ATC will consider a re-study with the MTEP22 models

MTEP21 Futures and Years

Future Names

- Future 1 (F1)
  - Only Future studied last year
- Future 2 (F2)
- Future 3 (F3)

Model Years

- 2025
- 2030
- 2035
- 2040

Sources for Next Few Slides

- MISO MTEP21 Futures Summary One-Pager
  - https://cdn.misoenergy.org/MISO%20Futures%20One%20Pager538214.pdf
- MISO Futures Report
  - https://cdn.misoenergy.org/MISO%20Futures%20Report538224.pdf
- MISO MTEP Futures Website
  - https://www.misoenergy.org/planning/transmission-planning/futures-development/

MTEP21 Net Load Growth Rate

	Future 1	Future 2	Future 3
Energy	0.48%	1.09%	1.71%
Demand	0.60%	0.97%	1.41%

MTEP21 Generation Additions

	Future 1	Future 2	Future 3
CC	37.1 GW	58.7 GW	49.1 GW
CT	14.1 GW	10.5 GW	17.7 GW
Wind	18.7 GW	63.1 GW	123.1 GW
Solar	34.7 GW	28.7 GW	28.7 GW
Hybrid	12 GW	1.2 GW	10.8 GW
DGPV	3.5 GW	3.5 GW	6.2 GW
EE/DR	8.8 GW	9 GW	12.7 GW
Hydro	0.1 GW	0.1 GW	0.1 GW
Battery	0.6 GW	3.4 GW	35.4 GW

MTEP21 Other Renewable Variables

	Future 1	Future 2	Future 3
Carbon Reduction from 2005	63%	65%	81%
Minimum Wind & Solar Penetration	26%	35%	46%
Utility Announced Plans for Renewable Buildout	85% Goals Met	100% Goals Met	100% Goals Met

MTEP21 Assumed Generation Retirement Age

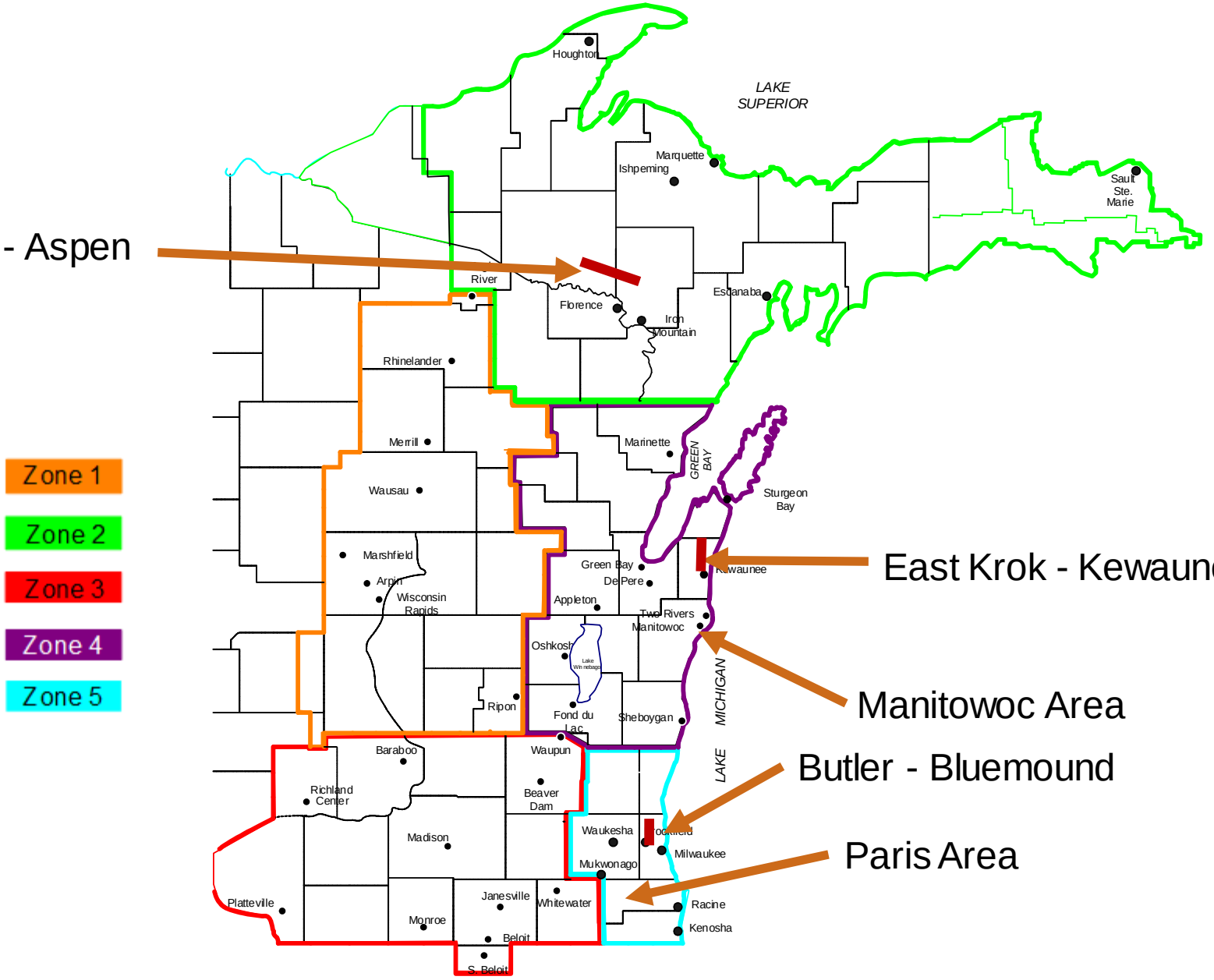
	Future 1	Future 2	Future 3
Coal	46 years	36 years	30 years
Natural Gas CC	50 years	45 years	35 years
Natural Gas Other	46 years	36 years	30 years
Oil	45 years	40 years	35 years
Wind & Solar	25 years	25 years	25 years
Nuclear	Retire if Publicly Announced		

Notable MTEP21 PROMOD Congestion

- Manitowoc Area
- Crystal Falls – Aspen 69kV (UP MI)
- East Krok – Kewaunee 138kV
- Paris Area
- Butler – Bluemound 138kV

- Considering other areas for study?

Crystal Falls - Aspen



East Krok - Kewaunee

Manitowoc Area

Butler - Bluemound

Paris Area

Stakeholder and Customer Feedback

- ATC is soliciting stakeholders and customers for new/other economic studies, recommended study assumptions changes, and study areas for our 2020 study
- ATC 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 and Generation Interconnection Projects
  - Stakeholder Feedback
- 2022 Model Development
  - Update with any new projects
- Analysis of Projects
  - Study Years – 2025, 2030, 2035 and 2040
  - Futures – All MISO MTEP21 Futures
- Timelines
  - April 15: Define Preliminary Assumptions
  - May 15: Finalize Assumptions
  - November 15: Provide Analysis Update

Questions?

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Thank you for your time!


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