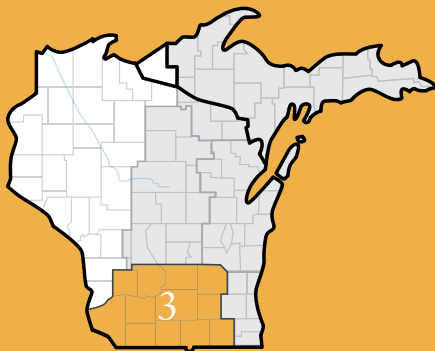




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businesses running and  
communities strong®

**An excerpt from ATC's 2011 10-Year Transmission System Assessment**  
An annual report describing economic and regional solutions to electric reliability needs



## Zone 3 – South Central / Southwest Wisconsin and North Central Illinois

**COLUMBIA**

**CRAWFORD**  
(southern portion)

**DANE**

**DODGE**

**GRANT**

**GREEN**

**IOWA**

**LAFAYETTE**

**JEFFERSON**

**RICHLAND**

**ROCK**

**SAUK**

**WALWORTH**

**WINNEBAGO, ILL.**  
(northern portion)



# Economics, public policy increasingly influence transmission planning

## Mandatory reliability standards, renewable portfolio requirements affect plans

While reliably meeting the needs of electricity customers is the top priority for any transmission owner, market economics and public policy initiatives are playing a major role in how utilities plan for their system needs. Traditionally, transmission owners performed planning studies and analysis for their individual needs; today, however, while local reliability remains the responsibility of the owner, the trend is toward broader-based planning driven by regional transmission organizations, government agencies and electricity market economics.

Changing the way transmission system costs are allocated also affects the planning as well as permitting for system improvements. Regional planning initiatives increasingly focus on projects that provide additional benefits beyond local-area reliability. These multi-benefit, or Multi-Value Projects (as defined by Midwest Independent System Operator, Inc.), also include economic savings and the ability to move renewable energy from where it is generated to where it can be used. As these projects are identified, regulators from multiple states will need to work together to determine cost sharing as well as permitting. We are working diligently with all stakeholders to design an incremental regional build-out of these projects to move forward efficiently and cost-effectively.

Enforceable, mandatory reliability standards, developed by the North American Electric Reliability Corp. and approved by the Federal Energy Regulatory Commission in 2007, also play a role in how we plan, operate and maintain our system. Earlier this year, NERC issued a set of high-priority reliability issues to help the industry focus on standards setting, compliance, training and education. Several of those priorities, including a changing resource mix and the integration of new technologies, will impact the way we plan and operate our system.

Our planning process also is affected by pending Environmental Protection Agency regulations for electric generators and the recently issued FERC Order 1000 governing regional planning, public policy requirements and cost allocation.

The 2011 Assessment covers the years 2011 through 2020 and indicates a need for \$3.8 to \$4.4 billion in transmission system improvements. The total includes \$1.0 billion in specific network projects, \$1.0 billion in asset maintenance, \$0.7 billion in multi-benefits projects, and this year a range of \$1.1 to \$1.7 billion in other capital categories. Other capital categories can include developing or unspecified network projects, interconnection projects and infrastructure relocation.

Cost estimate of system improvements					
	2007	2008	2009	2010	2011
Total 10-Year Capital Cost	\$2.8B	\$2.7B	\$2.5B	\$3.4B	<b>\$3.8/\$4.4B</b>

## Transmission is the vital link in bringing power to communities

Transmission lines move electricity at high voltages over long distances – from power plants to communities where local utilities deliver power to homes and businesses via distribution lines. A reliable transmission network provides access to many sources of power, whether they are local or regional. Having multiple paths to get power from producers to consumers lessens the chance that they will experience service interruptions.



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## South Central / Southwest Wisconsin and North Central Illinois – Zone 3

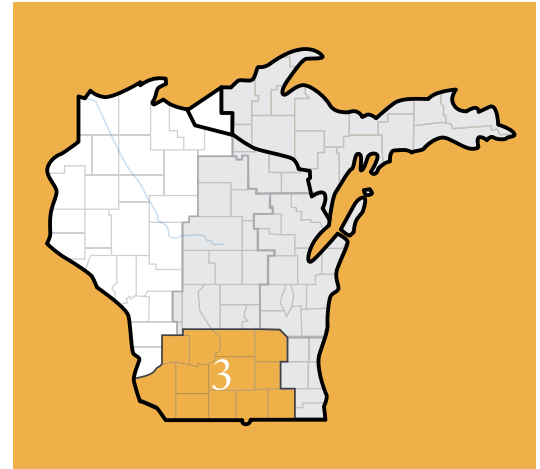
### Electric System Overview

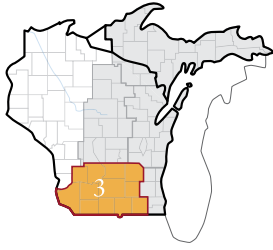
#### Slight increases expected in population, employment

Population in Zone 3 is projected to grow about 1.2 percent annually between now and 2020, and employment is projected to grow about 1.2 percent each year for the same time period. Dane County is projected to realize the largest increase in population and employment.

#### Higher-than-average demand anticipated

Electric load is expected to grow approximately 1.37 percent annually through 2020 for all of Zone 3.





# System Limitations South Central/Southwest Wisconsin and North

## Transmission system characteristics in Zone 3

ATC delivers power in Zone 3 with various transmission facilities including:

- ▶ Columbia-North Madison 345-kV lines,
- ▶ Columbia-Rockdale 345-kV line,
- ▶ Paddock-Rockdale 345-kV line (in-service spring 2010),
- ▶ Paddock-Wempletown 345-kV line,
- ▶ Rockdale-Wempletown 345-kV line, and
- ▶ 138-kV facilities from the Nelson Dewey Power Plant, around the Madison area, and in the northwest and southeast portions of Zone 3.

There are a number of transmission system performance issues in Zone 3 including voltage instability, limited import capability, overloaded lines and equipment, and low system voltages. The causes of these emerging issues include steady growth in certain areas, import capability from Illinois, new power plants and different generation dispatch scenarios.

## Transmission system limitations in Zone 3

In our analysis of Zone 3, we identified low voltages and transmission facility overloads. Low voltages are located in the Verona and Waunakee areas. Several overloads on 69-kV facilities in Zone 3 are emerging concerns.



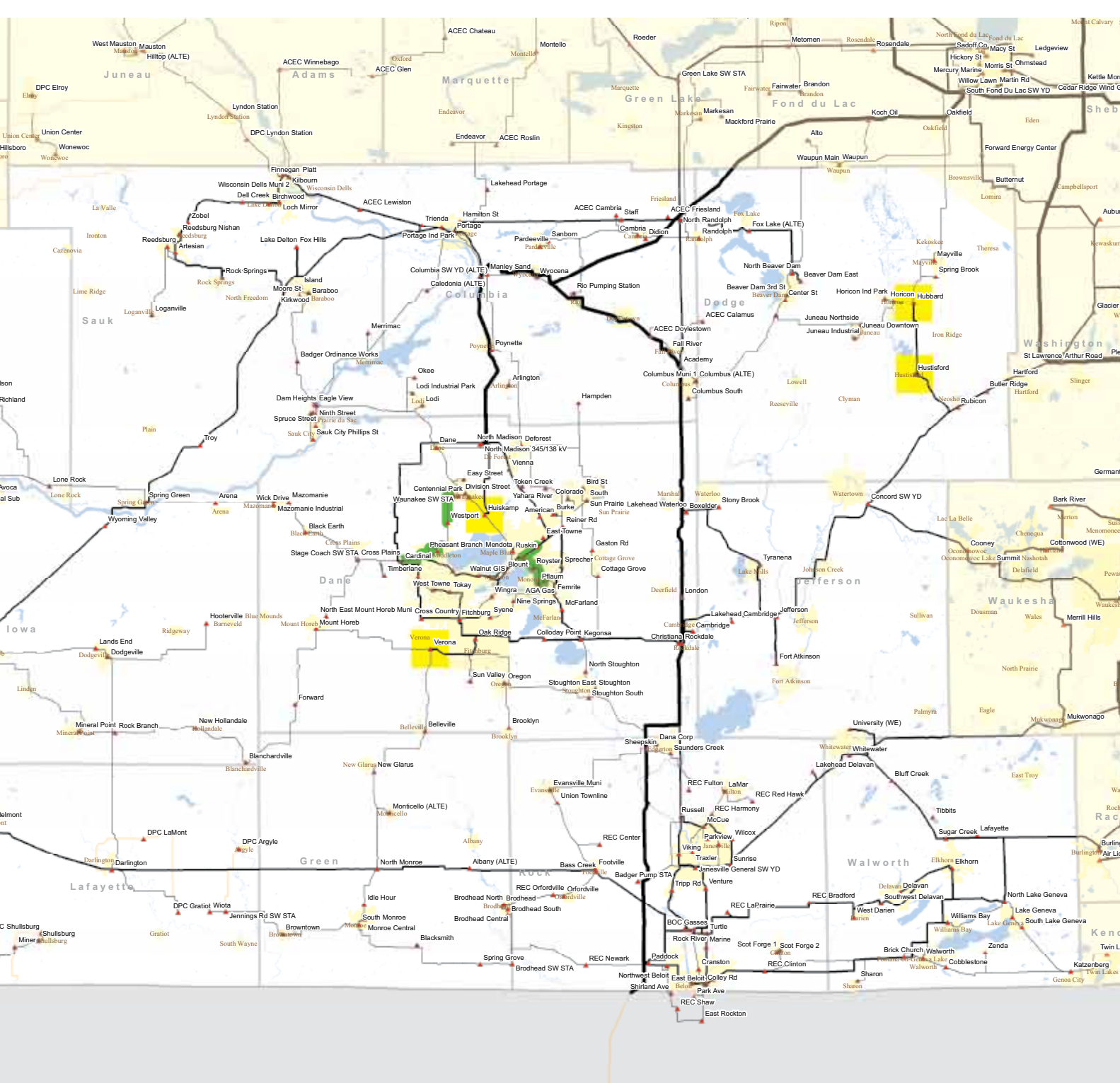
**Zone 3 includes the counties of:**

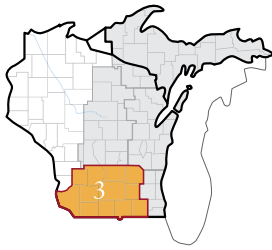
<b>COLUMBIA</b>	<b>GREEN</b>	<b>ROCK</b>
<b>CRAWFORD</b> (southern portion)	<b>IOWA</b>	<b>SAUK</b>
<b>DANE</b>	<b>LAFAYETTE</b>	<b>WALWORTH</b>
<b>DODGE</b>	<b>JEFFERSON</b>	<b>WINNEBAGO, ILL.</b> (northern portion)
<b>GRANT</b>	<b>RICHLAND</b>	

**System Limitations Key**

- Low voltages
- Overloaded facility

# Central Illinois – Zone 3





## Transmission projects in Zone 3

# South Central/Southwest Wisconsin and North

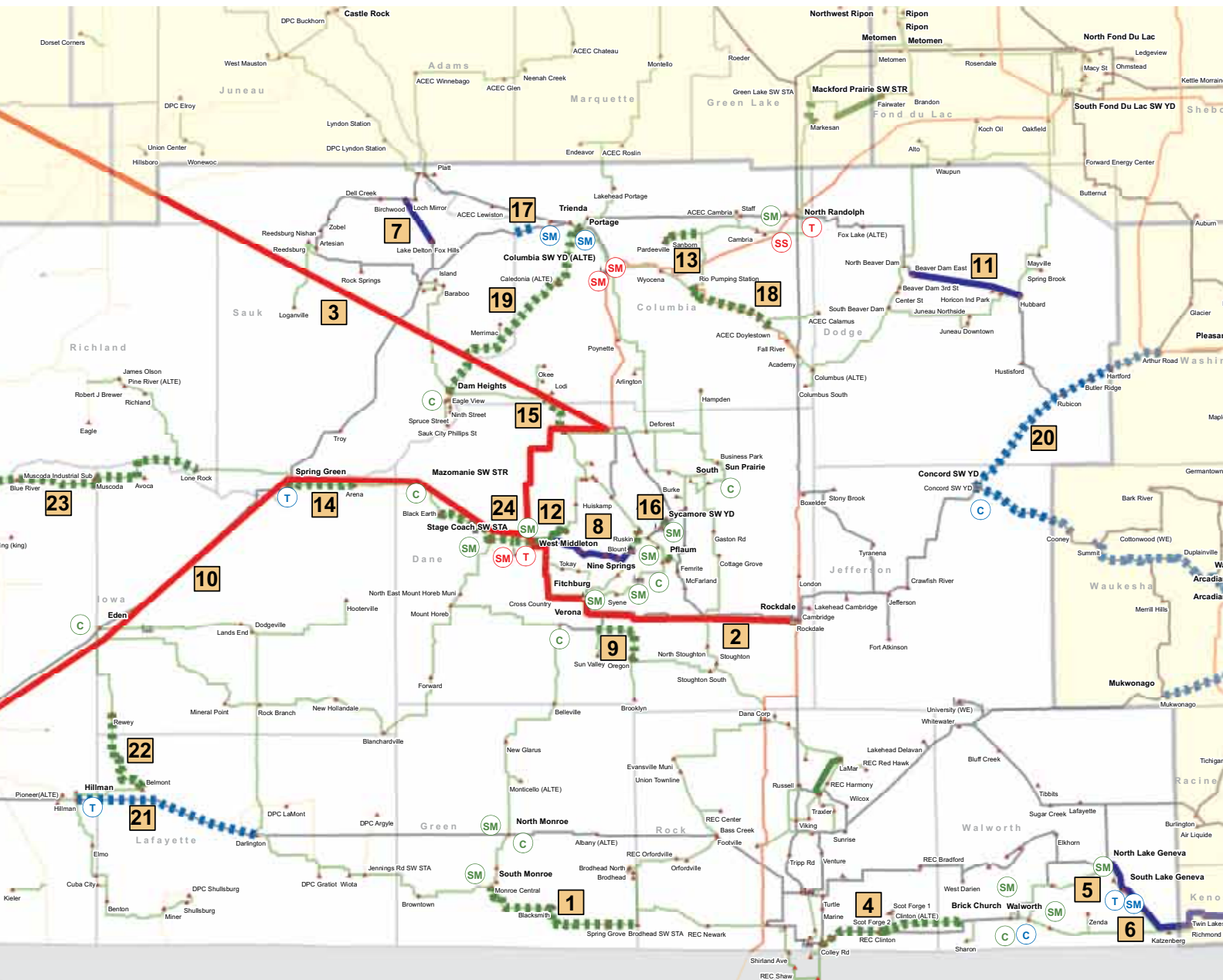
We have implemented 11 projects in Zone 3 since the 2010 Assessment, most notably the Bass Creek 138/69-kV transformer project and the Blount-Ruskin underground cable project.

Our current plans in Zone 3 include 35 system reliability and economic projects between 2011 and 2025. These projects are in various stages of development. The most notable planned, proposed, provisional and asset renewal projects in Zone 3, along with their projected year of completion and the factors driving the need for the projects, are listed below.

	Project description	In-service year	Need driver
<b>Planned projects</b>			
1	Brodhead-South Monroe 69-kV line rebuild	2011	Overloads and low voltages
2	Rockdale-West Middleton (Cardinal) 345-kV line	2013	Overloads and low voltages, improve transfer capability to Madison area, avert voltage collapse, lower system losses
<b>Proposed projects</b>			
3	Badger Coulee 345-kV line	2018	Policy benefits
<b>Provisional projects</b>			
4	Colley Road-Brick Church 69-kV line rebuild	2018	Overloads and low voltages
5	North Lake Geneva-South Lake Geneva 138-kV line	2018	Overloads and low voltages
6	Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	2019	Overloads and low voltages, provide network service
7	Lake Delton-Birchwood 138-kV line	2020	Overloads and low voltages
8	Cardinal-Blount 138-kV line	2020	Overloads and low voltages
9	Sun Valley Tap-Oregon 69-kV line rebuild	2020	Improve line condition and area voltages
10	Dubuque-Spring Green-Cardinal 345-kV line	2020	Policy benefits
11	Hubbard-East Beaver Dam 138-kV line	2022	Overloads and low voltages
12	West Middleton-Pheasant Branch 69-kV line rebuild	2022	Overloads and low voltages
<b>Asset Renewal projects</b>			
13	Pardeeville Tap-North Randolph/Rio 69-kV line partial rebuild	2011	Condition and performance
14	Spring Green-Stagecoach 69-kV line partial rebuild	2011	Condition and performance
15	Dane-Dam Heights 69-kV line partial rebuild	2012	Condition and performance
16	Sycamore-East Towne 69-kV underground cable replacements	2012	Condition and performance
17	Kirkwood-Trienda 138-kV line partial rebuild	2012	Condition and performance
18	Doylestown-Rio Pumping Station 69-kV line rebuild	2013	Condition and performance
19	Dam Heights-Portage 69-kV line rebuild	2016	Condition and performance
20	Concord-Rubicon-Butler Ridge-Hartford 138-kV line rebuild	2016	Condition and performance
21	Darlington-Hillman 138-kV line rebuild	2016	Condition and performance
22	Belmont-Rewey 69-kV line rebuild	2018	Condition and performance
23	Boscobel-Lone Rock 69-kV line rebuild	2018	Condition and performance
24	West Middleton-Stagecoach 69-kV underground cable replacement	2019	Condition and performance



# Central Illinois – Zone 3

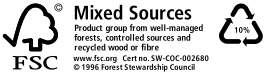


## System Solutions Key

<p><b>KEY</b></p> <p><b>C</b> Capacitor bank or reactor Relieves low voltages or high voltages</p> <p><b>T-D</b> T-D interconnection Supports local growth</p>	<p><b>TRANSMISSION LINE KEY</b></p> <p>●●● 345-kV transmission line</p> <p>▬ 115-, 138- or 161-kV transmission line</p> <p>▬ Rebuilt 115- or 138-kV transmission line</p> <p>▬ 69-kV transmission line</p> <p>▬ Rebuilt 69-kV transmission line</p>	<p><b>EXISTING TRANSMISSION LINES KEY</b></p> <p>▬ 69 kV</p> <p>▬ 115 kV</p> <p>▬ 138 kV</p> <p>▬ 161 kV</p> <p>▬ 230 kV</p> <p>▬ 345 kV</p>
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P.O. Box 47  
Waukesha, WI 53187-0047



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### ATC AT A GLANCE

- Formed in 2001 as the first multi-state, **transmission-only utility**
- Owner and operator of approximately **9,440 miles of transmission line and 515 substations**
- Meeting electric needs of more than **five million people** in 72 counties in four states: Wisconsin, Michigan, Minnesota and Illinois
- \$2.9 billion** in total assets

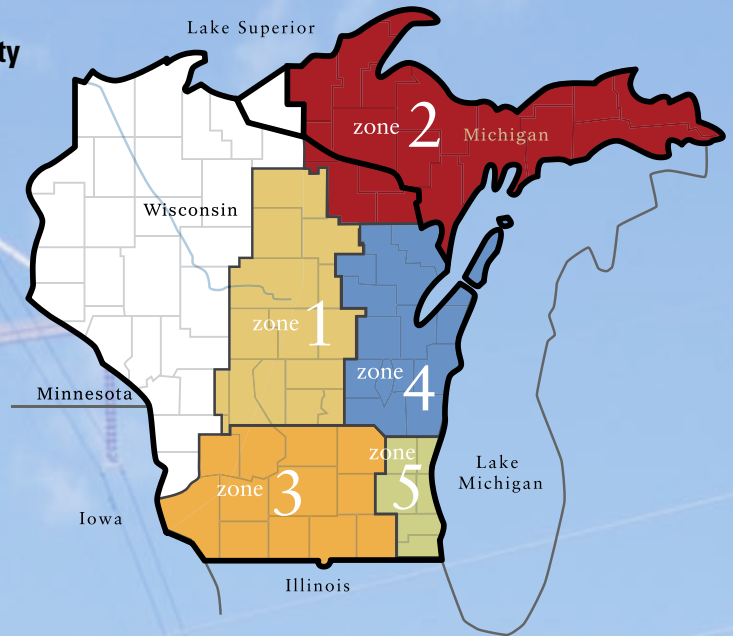
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More detailed information is available at [www.atc10yearplan.com](http://www.atc10yearplan.com)



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