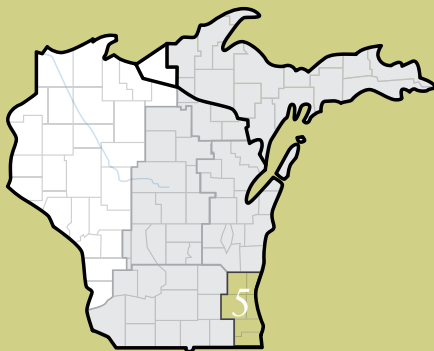




Helping to **keep the lights on**,
businesses running and
communities strong®

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



Zone 5 – Southeast Wisconsin

**KENOSHA
MILWAUKEE**

**OZAUKEE
RACINE**

**WASHINGTON
WAUKESHA**



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	\$3.8/\$4.4B

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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Southeast Wisconsin – Zone 5

Electric System Overview

Small increases expected in population, employment

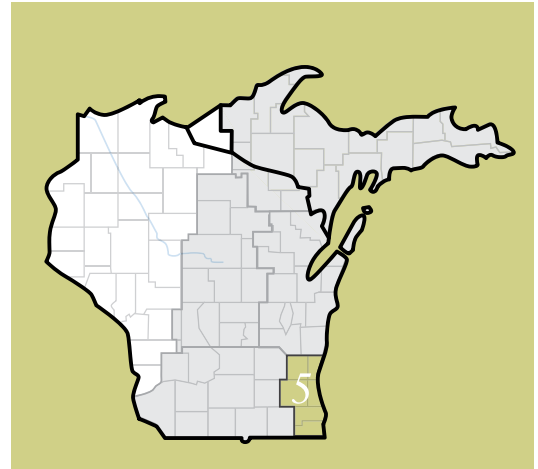
Population in Zone 5 is projected to grow 0.5 percent annually between now and 2020, and employment is projected to grow 0.8 percent in the same time period.

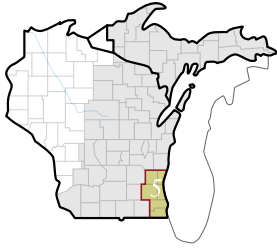
Waukesha County is projected to realize the largest increase in both population and employment.

Electricity usage growing

Peak electric demand typically occurs during the summer months. Large industrial loads in the Milwaukee metropolitan area, including Charter Steel and Miller Brewing, are among the largest electricity users in the zone.

Electric load is projected to grow approximately 1.25 percent annually through 2020.





System Limitations

Southeast Wisconsin – Zone 5

Transmission system characteristics in Zone 5

ATC delivers power in Zone 5 with various transmission facilities including:

- ▶ The southern portion of 345-kV lines from Point Beach and Edgewater,
- ▶ The Saukville, Arcadian, Granville, Oak Creek, and Racine 345/138-kV substations,
- ▶ The transmission lines emanating from the Pleasant Prairie and Oak Creek power plants,
- ▶ 230-kV facilities near Milwaukee, and
- ▶ A significant 138-kV network in the Milwaukee area, a portion of which is underground.

Apart from the analysis performed in this Assessment, there is one major area event that could impact transmission plans in Zone 5. The proposed road rebuild of the Zoo interchange is moving forward with the following in-service dates:

- ▶ Expand/update Watertown Plank area (2013),
- ▶ Expand/update Highway 100/Highway 45 area (2014), and
- ▶ Expand/update remainder of freeway (2015-2018).

The analyses of this road relocation project will likely result in new projects to reconfigure the transmission system around Bluemound and 96th Street substations. Further projects may develop depending on the Department of Transportation’s plans to rebuild the interchange. Studies are ongoing and plans will be finalized in the 2011-2012 timeframe.

Transmission system limitations in Zone 5

Key system performance issues in Zone 5 include:

- ▶ Heavy flows on aging facilities,
- ▶ Heavy flows from the west (Zone 3) resulting in heavily loaded 138-kV facilities in the western portion of Zone 5,
- ▶ Heavy market flows from and to the south, resulting in high 345-kV and 138-kV line loadings and the need to monitor potential multiple contingency conditions, and
- ▶ Sagging voltage profile in portions of Washington and Waukesha counties.

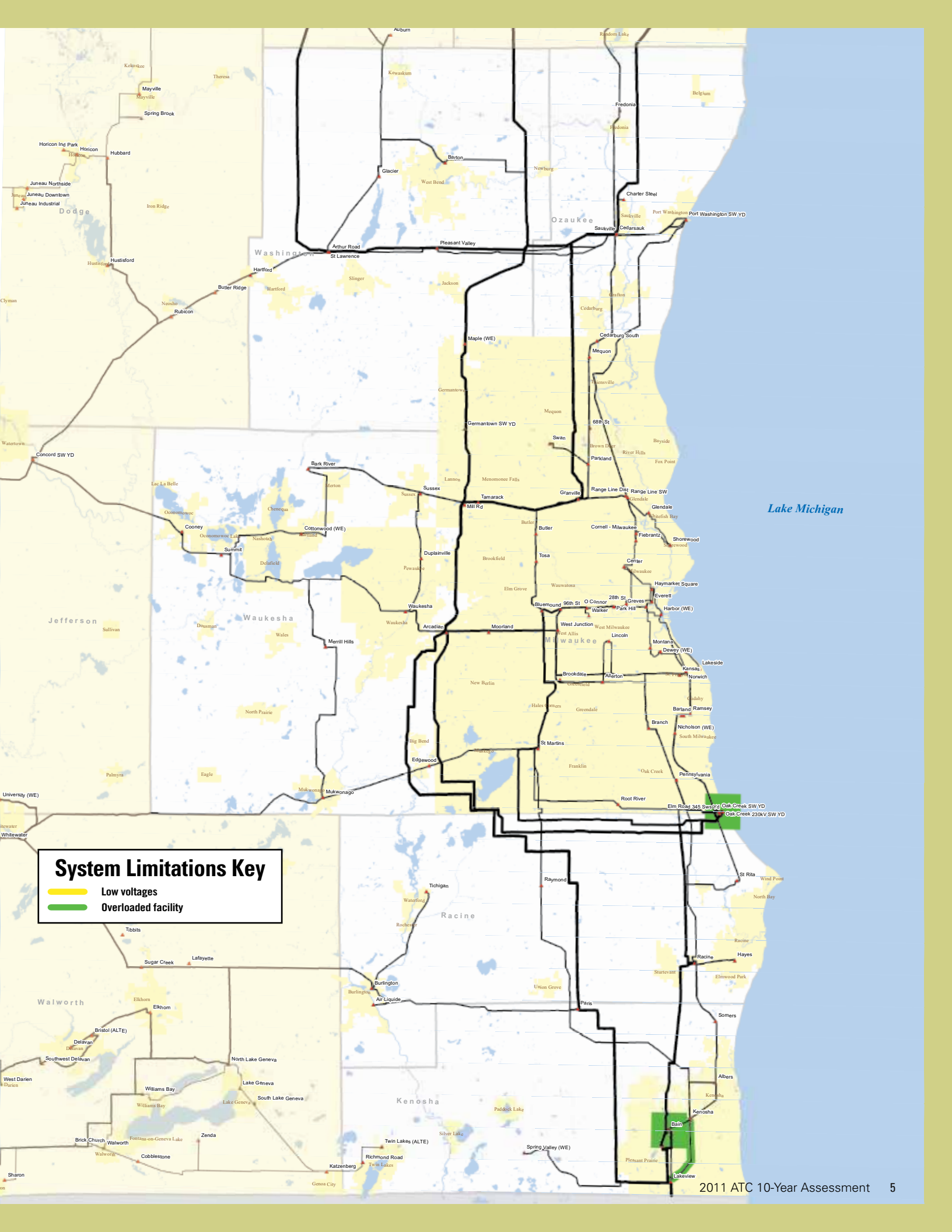
Transmission system reinforcements needed to interconnect and deliver the new generation at the Oak Creek Power Plant comprised much of the recent expansion to Zone 5. Load growth in Waukesha and Washington counties is projected to exceed the capabilities of the existing 138-kV system in those areas, signaling the need for future transmission system reinforcements.

Zone 5 includes the counties of:

**KENOSHA
MILWAUKEE**

**OZAUKEE
RACINE**

**WASHINGTON
WAUKESHA**

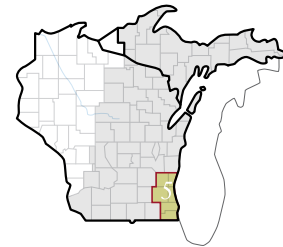


System Limitations Key

- Low voltages
- Overloaded facility

Transmission projects in Zone 5

Southeast Wisconsin – Zone 5



We have implemented three projects in Zone 5 since the 2010 Assessment, most notably the interconnection of the new 650 MW (615 MW net) generator at the Oak Creek Power Plant.

Our current plans in Zone 5 include ten 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 5, 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
Proposed projects			
1	Pleasant Prairie-Zion Energy Center 345-kV line	2014	Economics
2	Milwaukee County T-D 138-kV lines	2015	T-D interconnection
3	Arcadian-Waukesha 138-kV line rebuilds	2016	Overloads
Provisional projects			
4	Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	2019	Overloads and low voltages, provide network service
5	Replace Arcadian 345/138-kV transformers with single transformer	2020	Overloads
Asset Renewal projects			
6	Replace Bluemound 230/138-kV transformers	2011-2012	Condition and performance
7	St. Lawrence-Hartford 138-kV line rebuild	2014	Condition and performance
8	Concord-Cooney 138-kV line rebuild	2015	Condition and performance
9	Waukesha-Merrill Hills 138-kV line partial rebuild	2015	Condition and performance
10	Paris-Albers 138-kV line rebuild	2016	Condition and performance
11	Merrill Hills-Summit 138-kV line partial rebuild	2017	Condition and performance
12	Edgewood-St. Martins 138-kV line rebuild	2017	Condition and performance
13	Mukwonago-Edgewood 138-kV line rebuild	2017	Condition and performance
14	Oak Creek-Hayes 138-kV line rebuild	2019	Condition and performance

System Solutions Key

SUBSTATION KEY

- SS** **New substation**
Supports transmission system expansion
- SM** **Substation modifications**
Upgrades equipment ratings to avert facility overloads
- T** **Transformer**
Supports local growth and improves voltage levels
- C** **Capacitor bank or reactor**
Relieves low voltages or high voltages
- T-D** **T-D interconnection**
Supports local growth

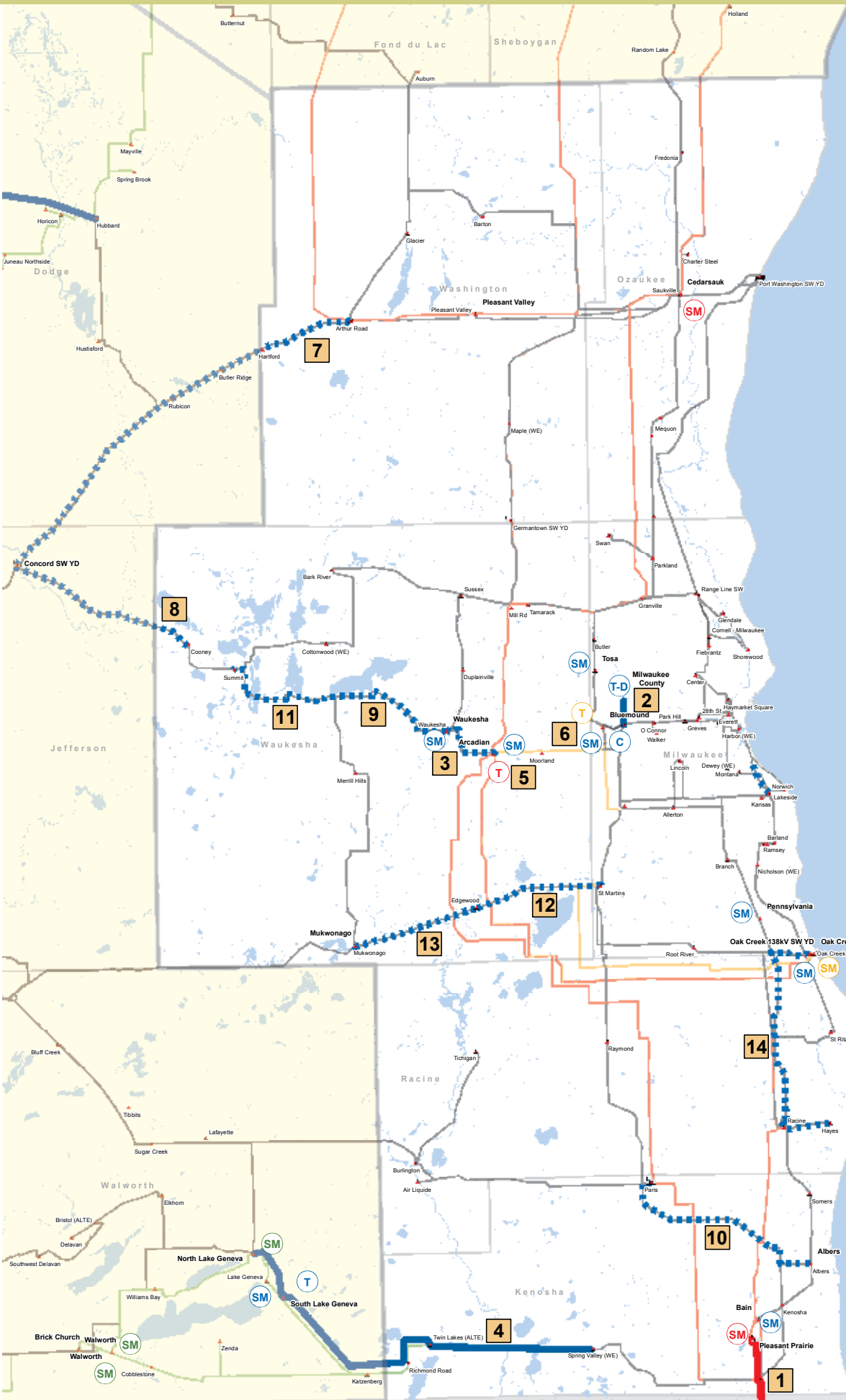
TRANSMISSION LINE KEY

- 345-kV transmission line
- ▬ 115-, 138- or 161-kV transmission line
- ▬ Rebuilt 115- or 138-kV transmission line
- ▬ Transmission line voltage conversion
- ▬ 69-kV transmission line
- ▬ Rebuilt 69-kV transmission line

EXISTING TRANSMISSION LINES KEY

- ▬ 69 kV
- ▬ 115 kV
- ▬ 138 kV
- ▬ 161 kV
- ▬ 230 kV
- ▬ 345 kV

Depending on the status of the projects shown, the transmission line additions may be for illustrative purposes only and may not reflect the actual routes.



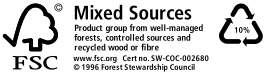
Lake Michigan

ILLINOIS

to Zion Energy Center



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

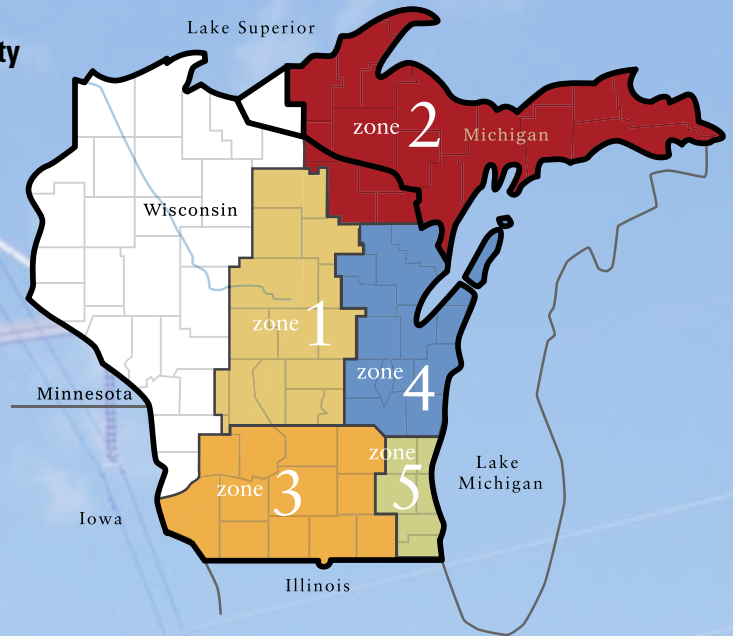
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More detailed information is available at www.atc10yearplan.com



www.atcllc.com

**Would you like a speaker from ATC to address your group?
Give us a call, toll-free, at 1.866.899.3204, ext. 6922.**

