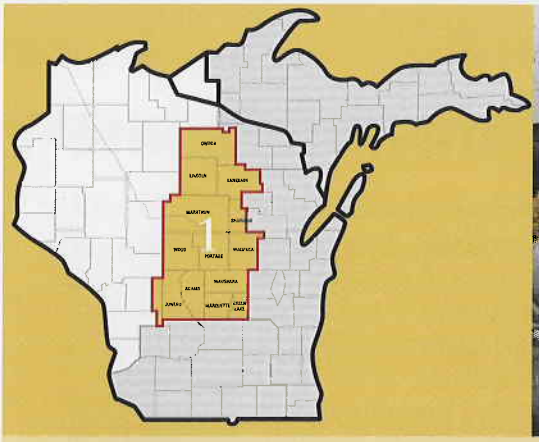


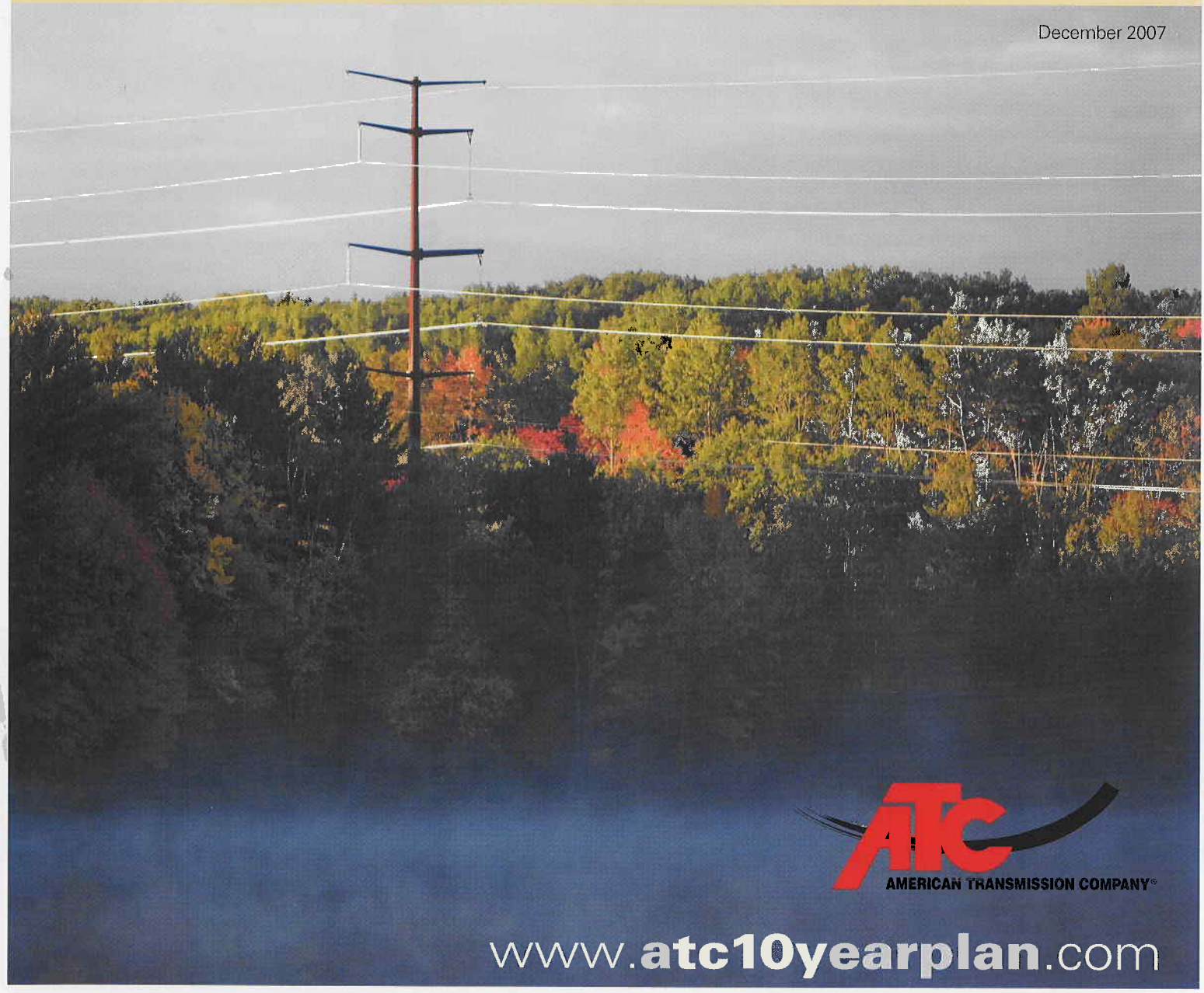
zone 1

North Central Wisconsin

2007 10-Year Transmission System Assessment **Update**

A look at electric transmission system limitations and proposed solutions for improving electric system reliability

December 2007



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www.**atc10yearplan**.com

Looking at tomorrow's electric needs today

Advances in technology powered by electricity are improving our quality of life. At the same time, they've created a dependence on and expectation for an uninterrupted supply of electricity. However, the age of the transmission system and changes in the regional wholesale electricity market are impacting the reliability of the electric system upon which people and businesses have become so dependent.

American Transmission Co. was formed in 2001 to plan, permit, build, own, operate and maintain a transmission system that meets the reliability, economic and adequacy needs of our customers. Our planners continually conduct engineering studies on the electric transmission system looking for potential problems that may affect the future performance of the system. Since 2001, ATC has produced annual assessments of the transmission system, identifying areas of need on the system and proposing solutions to those needs.

This document represents an update to our 2006 10-Year Assessment information based on further development of specific needs and projects during the past year. We did not undertake a complete set of new transmission system studies but used information from the 2006 10-Year Assessment to develop projects that will be put into service. These project changes are reflected in this summary.

As part of our technical studies, we take a comprehensive look at various factors affecting electricity utilization in the region, such as business development, employment trends, projected growth in population and electricity usage and savings from energy efficiency efforts.

We look 10 years into the future because it can take up to eight years to plan, study route options, get approvals and build new transmission lines.

Federal oversight increases

In recent years, the federal government has taken additional steps to ensure that transmission-owning utilities, like ATC, have produced and shared planning information with the public and local stakeholders. Since 2001, we have engaged in open and collaborative efforts to share information and solicit input on our plans. We believe that in making our planning efforts transparent and available to the public, the proposals for needed facilities can be more readily understood and accepted by communities that stand to benefit from them. The underlying principles of this approach are now required from utilities that own and plan for new transmission lines. An overview of our planning process is available at **www.atc10yearplan.com.**

In the years 2008 and beyond, ATC will be conducting additional public outreach, gathering input from our stakeholders early in the 10-Year Assessment process to include in our assumptions and models. We will also meet with interested stakeholders in the middle of the process to review interim results. This process is intended to provide even more openness and transparency and result in better planning.

Studies indicate need for $2.8 billion investment over 10 years

In our assessment of the electric transmission system needs through 2016, we estimate $2.8 billion in system improvements including 353 miles of new transmission lines and upgrades to 652 miles of existing lines across our service area.

The details of our studies can be found at **www.atc10yearplan.com.**

Transmission is the vital link in bringing power to

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 local electric distribution lines. A reliable transmission network provides access to many sources of power, whether they are local or regional. Having multiple paths

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North Central Wisconsin

Electric System Overview

Population, employment increasing

- Population is projected to grow 0.7 percent through 2011. From 2001 to 2006, Marathon County realized the largest increase in population, while Juneau County had the highest growth rate.
- Employment in Zone 1 is projected to grow 1.1 percent through 2011. From 2001 to 2006, Marathon County realized the largest increase in employment, while Adams County had the highest growth rate.

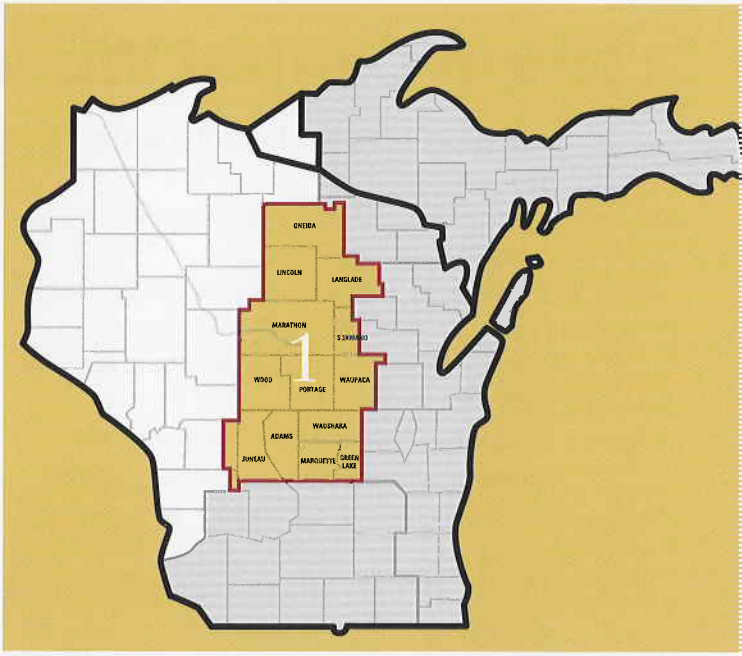
Electricity usage growing

- Peak electric demands typically occur during the summer months, with some winter peaks appearing in the northern portion. Primary electricity users in Zone 1 include a number of large paper mills and food processing plants.

  As depicted in the 2006 Assessment, electric load is projected to grow approximately 2.4 percent annually through 2015.
- Electric load is projected to grow approximately 2.4 percent annually through 2015.

Transmission projects completed or under way address electric needs

- **Arrowhead-Weston project** – This 345-kilovolt transmission line is under construction between Wausau, Wis., and Duluth, Minn. The 140-mile portion of this line between Gardner Park (Weston) and Stone Lake was completed in 2006. The entire 220-mile line is expected to be in service in 2008 and will improve reliability, help increase electric import capability and reduce the impact of system disturbances.
- **Gardner Park-Hilltop project** – A rebuild of an 11-mile, 115-kilovolt line was completed prior to the summer of 2007 to prevent electric system overloads and to support the addition of a new generator at Weston Power Plant.
- **Venus-Metonga project** – This 115-kilovolt transmission line between Monico and Crandon, Wis. was completed prior to the summer of 2007 to improve electric reliability and resolve local electric distribution voltage and capacity problems.



- **Gardner Park-Highway 22 (Central Wisconsin) project** – Construction is underway on a new 50-mile 345-kV line between the Gardner Park Substation near the Weston Power Plant and a new substation in central Shawano County to be named Highway 22. The 345-kilovolt line is needed to support output of Weston Power Plant and strengthen reliability.
- **Cranberry-Conover project** – The PSCW approved our application to construct this new 115-kilovolt transmission line between the southern boundary of Eagle River to just east of Conover. This project is currently under construction.

Our 2007 10-Year Transmission System Assessment Update outlines 17 additional projects to ensure electric system reliability in North Central Wisconsin. The following pages describe the system limitations in North Central Wisconsin and our planned, proposed and provisional projects to address those limitations.

communities

to get power from producers to consumers lessens the chance that they will experience service interruptions. Multiple major transmission lines also give power generators and local utilities the flexibility to access regions where they can sell and buy electricity to control overall costs for everyone.

North Central Wisconsin

Transmission system characteristics in Zone 1

ATC delivers power in Zone 1 with various transmission facilities including:

- an east-west 345-kV line extending west from the Appleton area to west of Stevens Point,
- a 345-kV line extending from the Weston Power Plant to Stevens Point,
- a 345-kV line extending northwest from the Weston Power Plant to just south of Hayward,
- a 115-kV network in the northern portion of the zone and
- a 138-kV and 69-kV network in the southern portion of the zone.

There are a number of forecasted transmission system performance issues in Zone 1 including generator instability, voltage instability, overloaded lines and equipment, low system voltages and the inability to import more power from neighboring states. Driving these issues are steady or rapid load growth in certain areas, ATC customer needs to import additional power and the construction of a new power plant in the Wausau area.

Transmission system limitations in Zone 1

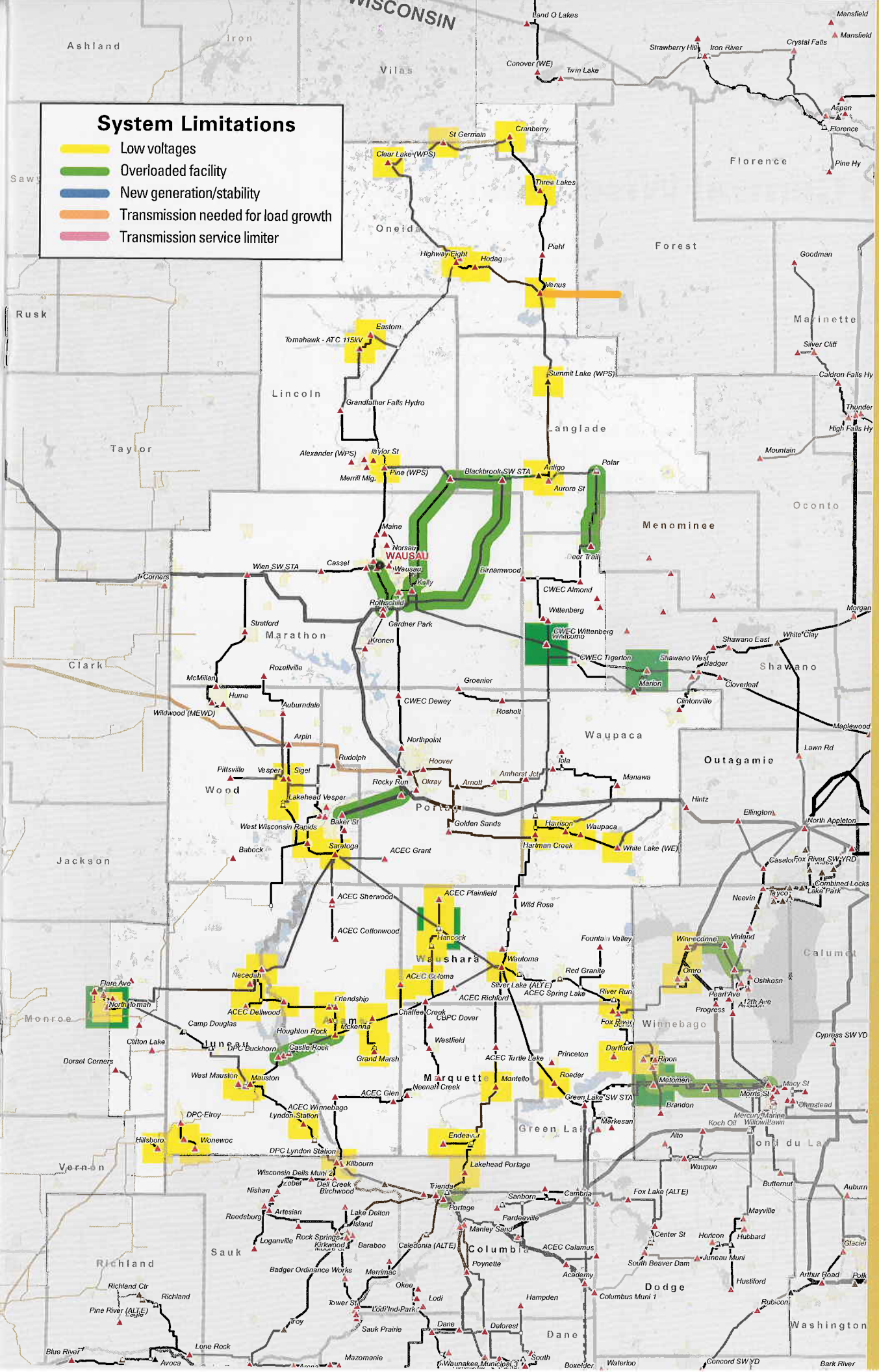
In the analysis of the year 2007 for Zone 1 performed for the 2006 Assessment, we identified low voltages, transmission facility overloads and potential generator instability. In addition, when power imports from Minnesota are high, heavily loaded facilities continue to result in the system operating with very little margin.

The most notable low voltages occur in the area north of Wausau toward the Michigan border (the Rhinelander Loop). The most notable facility overloads occur on 115-kV lines, also in the Rhinelander Loop. We are implementing a number of projects to reinforce the Rhinelander Loop. A new transmission line providing a new source to the area will be needed in 2008, and an additional source is anticipated to be needed beyond the 2020 timeframe.

Accommodating new generation under construction at the Weston Power Plant will require significant system reinforcements in Zone 1. Low voltages and overloaded facilities in and around the Wausau area and in the Berlin-Ripon area will necessitate a combination of reinforcements.

Zone 1 includes the Wisconsin counties of:

- Adams
- Forest (southwestern portion)
- Fond du Lac (northwest portion)
- Green Lake
- Juneau
- Langlade
- Lincoln
- Marathon
- Marquette
- Monroe (eastern portion)
- Oneida
- Portage
- Shawano (western portion)
- Vernon (eastern portion)
- Vilas (southern portion)
- Waupaca
- Waushara
- Winnebago (western portion)
- Wood

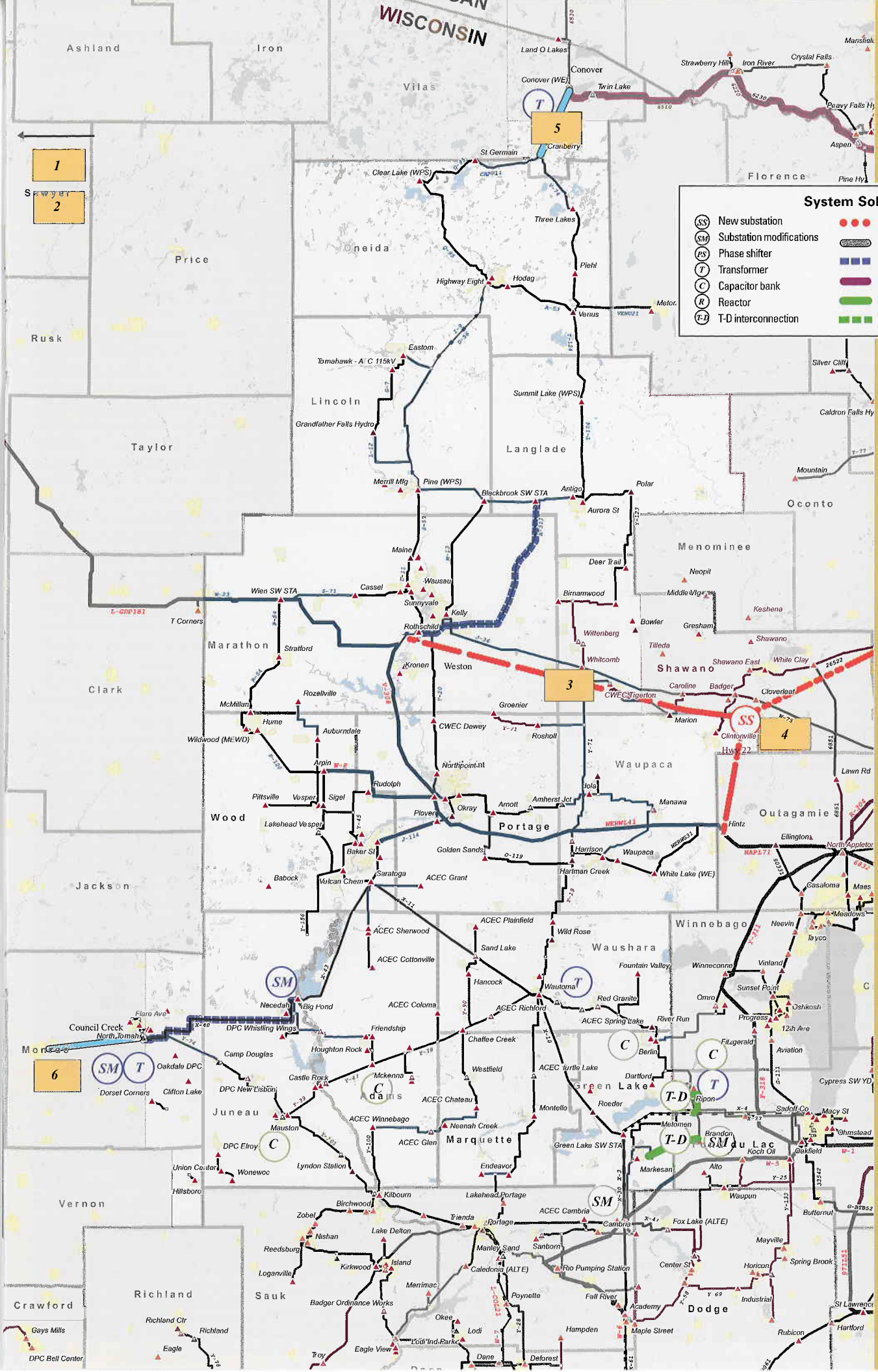

System Limitations
Low voltages
Overloaded facility
New generation/stability
Transmission needed for load growth
Transmission service limiter
WISCONSIN
Ashland
Iron
Vilas
Land O Lakes
Conover (WE)
Twin Lake
Strawberry Hill
Iron River
Crystal Falls
Mansfield
Mansfield
Aspen
Florence
Pine Hy
Florence
Forest
Oneida
Cranberry
St Germain
Clear Lake (WPS)
Three Lakes
Piehl
Highway Eight
Hodag
Venus
Goodman
Marinette
Silver Cliff
Caldron Falls Hy
Thunder
High Falls Hy
Mountain
Rusk
Eastom
Tomahawk - ATC 115kV
Lincoln
Grandfather Falls Hydro
Summit Lake (WPS)
Langlade
Taylor
Alexander (WPS)
Taylor St
Merrill Mfg.
Pine (WPS)
Blackbrook SW STA
Antigo
Aurora St
Polar
Oconto
Menominee
Maine
Norsaug
WAUSAU
Wausau
Kelly
Cassel
Wien SW STA
Corners
Rothschild
Gardner Park
Kronen
Birnamwood
CWEC Almond
Wittenberg
CWEC Wittenberg
Whitcomb
CWEC Tigerton
Shawano East
White Clay
Shawano West
Badger
Marion
Cloverleaf
Clintonville
Morgan
Stratford
Marathon
Clark
McMillan
Rozellville
Hume
Auburndale
Wildwood (MEWD)
Groenier
CWEC Dewey
Rosholt
Arpin
Northpoint
Rudolph
Hoover
Pittsville
Vesper
Sigel
Rocky Run
Okray
Arnott
Amherst Jct
Iola
Manawa
Waupaca
Maplewood
Lawn Rd
Outagamie
Wood
Lakehead Vesper
Portage
Baker St
West Wisconsin Rapids
Babock
Saratoga
ACEC Grant
Golden Sands
Harrison
Waupaca
Hartman Creek
White Lake (WE)
Hintz
Ellington
North Appleton
Casalon
Fox River SW YRD
Combined Locks
Lake Park
Tayco
Neevin
Jackson
ACEC Sherwood
ACEC Plainfield
Wild Rose
ACEC Cottonwood
Hancock
Waushara
Wautoma
Silver Lake (ALTE)
ACEC Spring Lake
Red Granite
Fountain Valley
Winneconne
Vinland
Calumet
Omro
Oshkosh
Pearl Ave
12th Ave
Progress
River Run
Fox River
Winnebago
Flare Ave
North Tomah
Necedah
ACEC Dellwood
Friendship
ACEC Richford
Chaffee Creek
CBPC Dover
Monroe
Camp Douglas
Clifton Lake
Dorset Corners
Lyndon Station
DPC Buckhorn
Castle Rock
Houghton Rock
McKenna
Grand Marsh
Westfield
ACEC Turtle Lake
Princeton
Dartford
Ripon
Cypress SW YD
Metomen
Macy St
Morris St
Ohmstead
Brandon
Green Lake SW STA
Markesan
Mercury Marine
Willow Lawn
Koch Oil
Alto
Waupun
Fond du Lac
Green Lake
Marquette
Mauston
West Mauston
Montello
Roeder
Neenah Creek
ACEC Glen
ACEC Winnebago
DPC Elroy
Wonewoc
Hillsboro
Endeavor
DPC Lyndon Station
Kilbourn
Lakehead Portage
Wisconsin Dells Muni 2
Dell Creek
Birchwood
Nishan
Trienda
Portage
Sanborn
Cambria
Fox Lake (ALTE)
Butternut
Auburn
Mayville
Vernon
Reedsburg
Artesian
Lake Delton
Island
Pardeeville
Manley Sand
Center St
Horicon
Hubbard
Glacier
Juneau Muni
Loganville
Rock Springs
Kirkwood
Baraboo
Caledonia (ALTE)
Columbia
ACEC Calamus
Sauk
Richland
Badger Ordinance Works
Merrimac
Poynette
South Beaver Dam
Academy
Hustiford
Arthur Road
Polk
Richland Ctr
Richland
Pine River (ALTE)
Okee
Lodi
Tower St
Lodi Ind Park
Troy
Sauk Prairie
Dane
Deforest
Hampden
Columbus Muni 1
Dodge
Rubicon
Washington
Blue River
Lone Rock
Avoca
Mazomanie
Waunakee Municipal 3
South
Boxelder
Waterloo
Concord SW YD
Bark River

North Central Wisconsin

We have implemented eleven projects in Zone 1 since the 2006 Assessment, most notably the construction of the 140-mile Gardner Park-Stone Lake 345-kV line. Studies conducted for prior assessments indicate the potential for generation at Weston Power Plant becoming unstable if certain disturbances on the transmission system occur. The expansion of the Weston Substation, in conjunction with the construction of the new Gardner Park Substation and the Gardner Park-Highway 22 345-kV line, remedies this issue.

Our current plans in Zone 1 include more than 20 projects between 2007 and 2016. These projects are in various stages of development. The most notable planned, proposed and provisional projects in Zone 1, 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
	Planned projects		
1	Arrowhead-Stone Lake-Gardner Park 345-kV line (under construction)	2008	Improves reliability, helps increase import capability, reduces reliance on operating guides, lowers system losses
2	Stone Lake 345/161-kV Substation (under construction)	2008	Improves operation of Arrowhead-Gardner Park line, improves reliability in northwestern Wisconsin
3	Gardner Park-Central Wisconsin 345-kV line (under construction)	2009	Needed to deliver output of Weston 4 generation
4	Highway 22 345-kV Substation (under construction)	2009	Needed to deliver output of Weston 4 generation
5	Cranberry-Conover 115-kV line (under construction)	2008	Along with Conover-Plains 138-kV line upgrade (Zone 2), addresses low voltages/voltage collapse in Rhinelander Loop area, improves Wisconsin-Michigan UP transfer capability, improves voltages in western UP
	Provisional projects		
6	Monroe County-Council Creek 161-kV line	2012	Addresses low-voltage situation in the area, improves import capability, avoids need to reconfigure system during emergencies


WISCONSIN
Ashland
Iron
Vilas
Land O Lakes
Conover
Conover (WE)
Twin Lake
Strawberry Hill
Iron River
Crystal Falls
Mansfield
Peavy Falls Hy
Aspen
Florence
Pine Hy
Cranberry
St Germain
Clear Lake (WPS)
Three Lakes
Oneida
Price
Rusk
Piehl
Highway Eight
Hodag
Venus
Meter.
Eastom
Tomahawk - A C 115kV
Lincoln
Summit Lake (WPS)
Grandfather Falls Hydro
Taylor
Langlade
Silver Cliff
Caldron Falls Hy
Mountain
Merrill Mfg
Pine (WPS)
Blackbrook SW STA
Antigo
Polar
Aurora St
Oconto
Menominee
Maine
Deer Trail
Neopit
Wausau
Cassel
Wien SW STA
Birnamwood
Middle Vlge
Sunnyvale
Kelly
Keshena
T Corners
Rothschild
Bowler
Gresham
Wittenberg
Shawano
Marathon
Stratford
Tilleda
Whitcomb
Kronen
Weston
Shawano East
White Clay
Caroline
Badger
Cloverleaf
Clark
Rozellville
McMillan
CWEC Tigerton
Groenier
Marion
Hume
Auburndale
CWEC Dewey
Rosholt
Clintonville
Hwy 22
Wildwood (MEWD)
Arpin
Northpoint
Waupaca
Lawn Rd
Rudolph
Pittsville
Vesper
Sigel
Jole
Amherst Jct
Manawa
Okray
Arnott
Plover
Wood
Lakehead Vesper
Portage
Hintz
Outagamie
Ellington
North Appleton
Baker St
Golden Sands
Harrison
Waupaca
Hartman Creek
White Lake (WE)
Jackson
Babock
Vulcan Chem
Saratoga
ACEC Grant
Casaloma
Maes
Meadows
ACEC Plainfield
Winnebago
Neevin
Tayco
ACEC Sherwood
Wild Rose
Sand Lake
Waushara
ACEC Cottonville
Fountain Valley
Winneconne
Vinland
Hancock
Wautoma
Sunset Point
Omro
Red Granite
Necedah
Big Pond
ACEC Coloma
ACEC Richford
Oshkosh
Progress
ACEC Spring Lake
River Run
Flare Ave
Council Creek
North Tomah
DPC Whistling Wings
Friendship
Chaffee Creek
12th Ave
Fitzgerald
Aviation
Houghton Rock
Berlin
Camp Douglas
Oakdale DPC
Westfield
ACEC Turtle Lake
Dartford
Cypress SW YD
Castle Rock
Mckenna
Dorset Corners
Clifton Lake
DPC New Lisbon
Adams
ACEC Chateau
Montello
Roeder
Ripon
Sadoff Co
Macy St
Juneau
Mauston
ACEC Winnebago
Neenah Creek
Melomen
Brandon
Johnstead
DPC Elroy
ACEC Glen
Marquette
Green Lake SW STA
Koch Oil
Oakfield
Union Center
Wonewoc
Lyndon Station
Endeavor
Markesan
Alto
Hillsboro
Vernon
Kilbourn
Lakehead Portage
Waupun
Birchwood
ACEC Cambria
Butternut
Zobel
Trienda
Portage
Cambria
Fox Lake (ALTE)
Nishan
Lake Delton
Mayville
Reedsburg
Manley Sand
Sanborn
Center St
Spring Brook
Island
Kirkwood
Caledonia (ALTE)
Rio Pumping Station
Horicon
Loganville
Merrimac
Richland
Crawford
Sauk
Poynette
Fall River
Industrial
Badger Ordinance Works
Academy
Dodge
St Lawrence
Okee
Richland Ctr
Richland
Lodi
Maple Street
Hartford
Gays Mills
Eagle
Lodi Ind Park
Hampden
Rubicon
DPC Bell Center
Eagle View
Troy
Dane
Deforest
1
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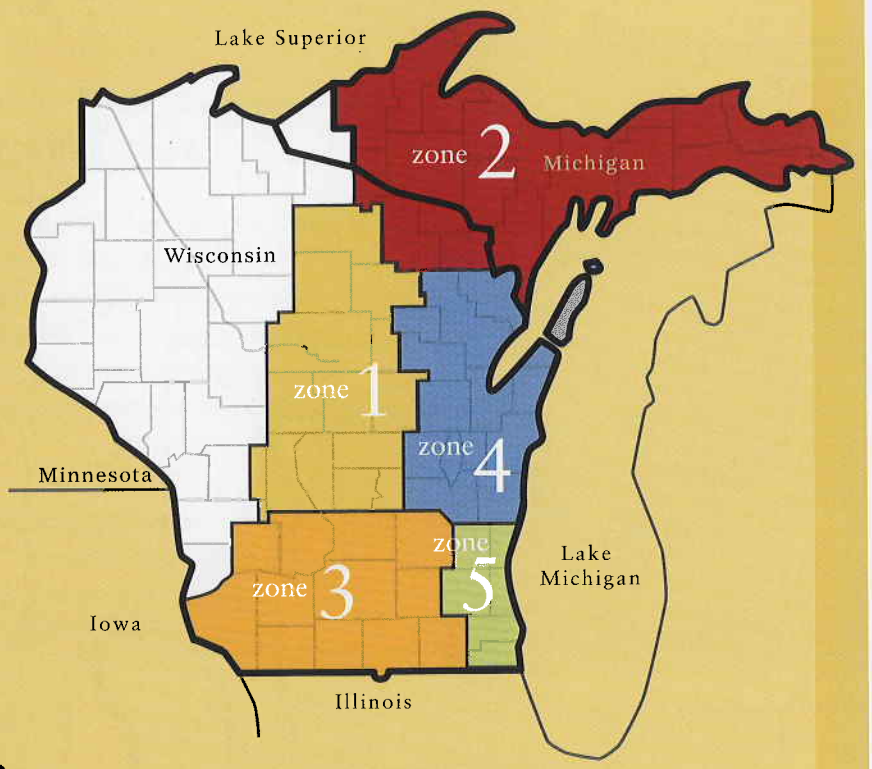
System Solutions
New substation
Substation modifications
Phase shifter
Transformer
Capacitor bank
Reactor
T-D interconnection
345-kV transmission line
115-, 138- or 161-kV transmission line
Rebuilt 115- or 138kV transmission line
Transmission line voltage conversion
69-kV transmission line
Rebuilt 69-kV transmission line

ATC at a glance

- Formed in 2001 as the first multi-state, **transmission-only utility.**
- Owner and operator of approximately **9,100 miles of transmission line and 480 substations.**
- Meeting electric needs of approximately **five million people.**
- Transmission facilities in **66 counties** in Wisconsin, Michigan and Illinois.
- **$1.8 billion** in total assets.
- **Seven offices** in the communities of Cottage Grove, De Pere, Madison, Waukesha and Wausau, Wis.; Kingsford, Mich.; and Washington DC.



As a public utility, we have duties and responsibilities to:

- Operate the transmission system reliably,
- Assess the ability of the system to adequately meet current and future needs,
- Plan system upgrades to meet those needs in the most efficient, effective and economic ways,
- Construct upgrades in time to meet those needs,
- Maintain the transmission equipment and surroundings to minimize opportunity for failures.

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Helping to **keep the lights on,**
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