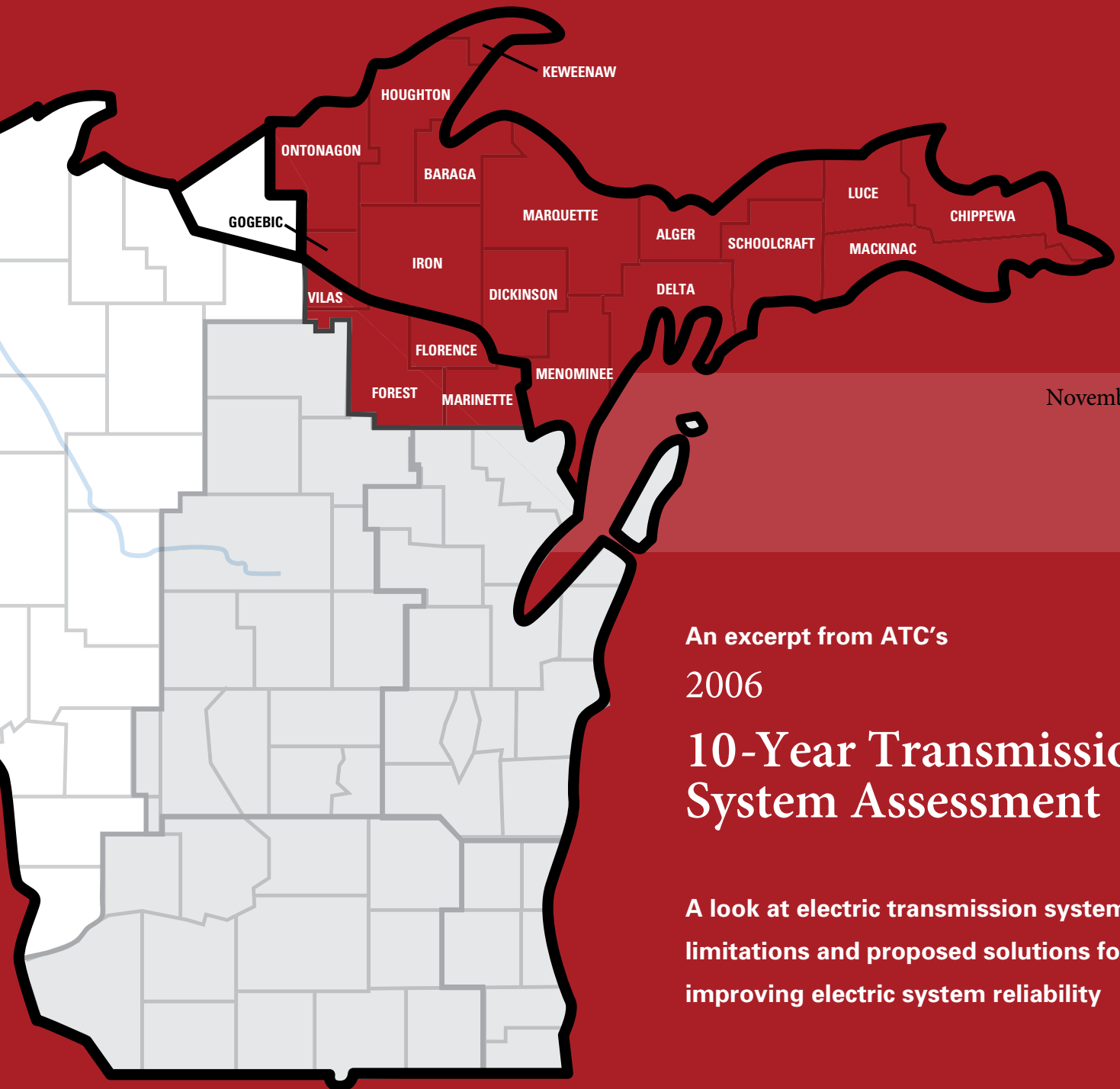




Zone 2 – Michigan's Upper Peninsula and Northern Wisconsin



November 2006

An excerpt from ATC's
2006

10-Year Transmission System Assessment

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

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, it's created a dependence on and expectation for an uninterrupted supply of electricity. We rarely notice how plugged in we are...unless the lights go out.

At ATC, we are helping to keep the lights on, businesses running and communities strong. However, the age of the electric 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.

To address the issues, ATC continually conducts engineering studies on the electric transmission system looking for potential problems that may affect the future performance of the system. 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, population and projected growth in electricity usage.

Our findings are summarized in an annual 10-Year Transmission System Assessment, which identifies and begins to prioritize future projects needed to improve the adequacy and reliability of the electric transmission system. 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.

Studies indicate need for \$3.1 billion investment over 10 years

In our assessment of the electric transmission system needs through 2016, we estimate \$3.1 billion in system improvements including 360 miles of new transmission lines and upgrades to more than 840 miles of existing lines across our service area. Summarized in this booklet are highlights of the electric transmission system issues in Michigan's Upper Peninsula and Northern Wisconsin.

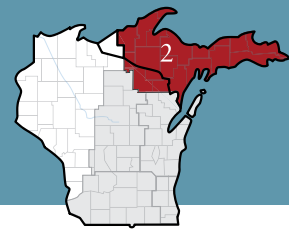
For complete information from our 2006 10-Year Assessment, go to: www.atc10yearplan.com

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 local electric 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. 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.



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Zone 2 – Michigan’s Upper Peninsula and Northern Wisconsin

Electric System Overview

Population, employment increasing

- Population in Zone 2 is projected to grow 0.3 percent annually through 2011. From 2001 to 2006, Vilas County realized the largest increase in population and the highest growth rate.
- Employment in Zone 2 is projected to grow 1.4 percent annually through 2011. From 2001 to 2006, Marquette County realized the largest increase in employment, while Forest County had the highest growth rate.

Electricity usage growing

- Zone 2 typically experiences peak electric demands during the winter months. Ore mining and paper mills are the largest electricity users in the zone.
- Electric load is projected to grow 0.4 percent annually through 2015.

Transmission projects completed or under way address electric needs

- **Plains-Stiles transmission line rebuild** – In 2006, we completed the rebuild of 110 miles of 138-kilovolt transmission lines in Oconto and Marinette counties in Wisconsin, and Menominee and Dickinson counties in Michigan that are more than 80 years old. The lines were operating at their limits and often were overloaded, limiting the transfer of power between northeastern Wisconsin and the Upper Peninsula of Michigan.

Our 2006 10-Year Transmission System Assessment outlines 40 additional projects to ensure electric system reliability in Michigan’s Upper Peninsula and Northern Wisconsin. The following pages describe the system limitations in Michigan’s Upper Peninsula and Northern Wisconsin, and our planned, proposed and provisional projects to address those limitations.

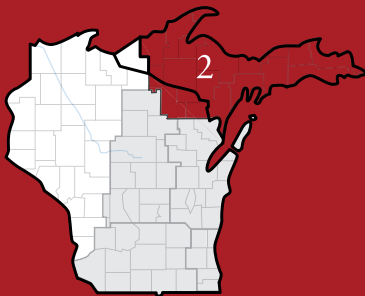
Zone 2 – Michigan’s Upper Peninsula and North

Transmission system characteristics in Zone 2

ATC delivers power in Zone 2 with various transmission facilities including:

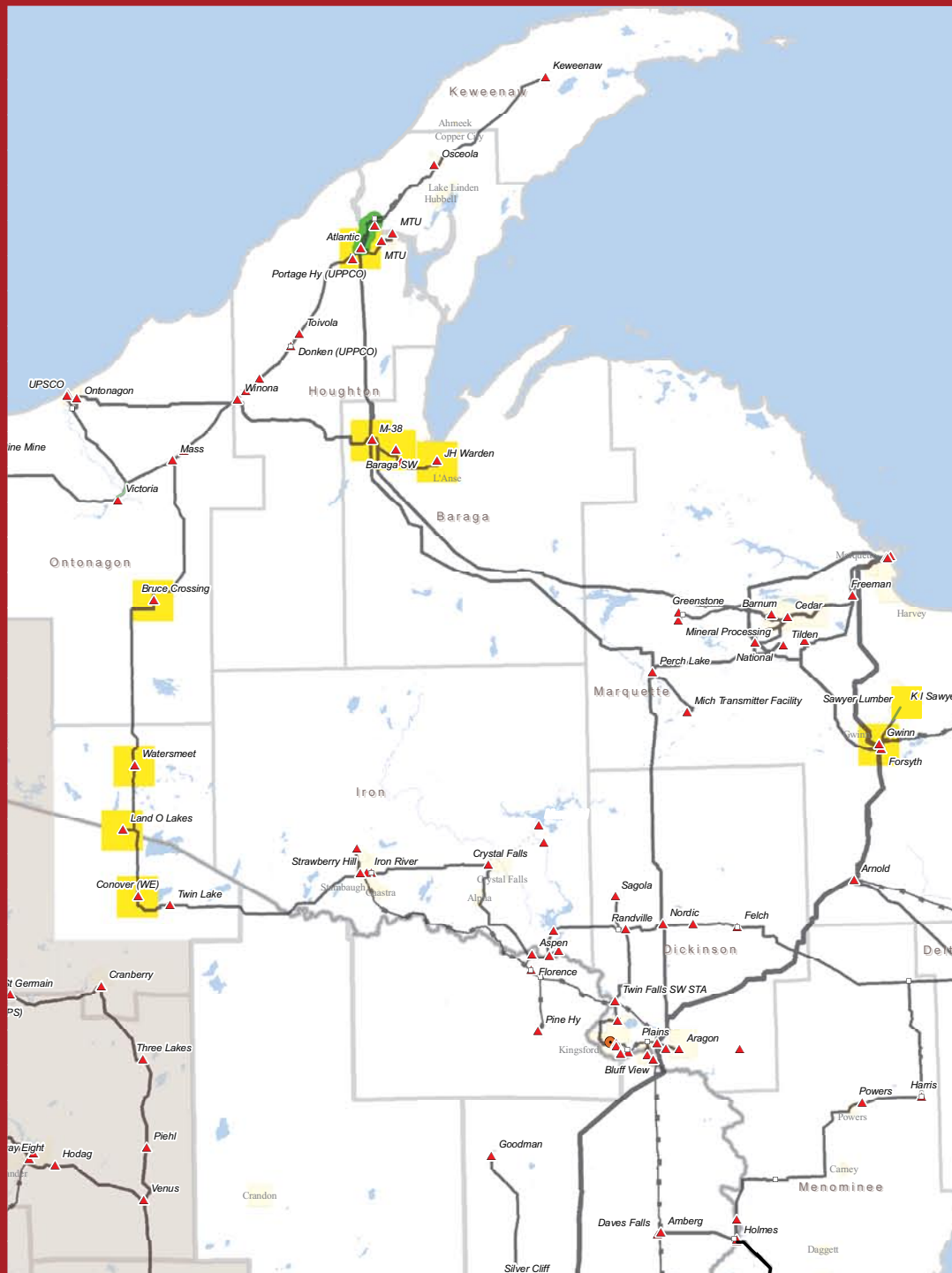
- a north-south 345-kV line extending from near Marquette to the Iron Mountain area and southwest to the Oconto area,
- 138-kV lines from Arnold to the Manistique area,
- a 138/69-kV network in the western portion of the zone and
- a 69-kV network in the eastern portion of the zone.

There are a number of transmission system performance issues in Zone 2 including limited ability to import or export power, generator instability, overloaded lines and equipment, low system voltages and the chronic limitations to transmission service. Primary drivers of these issues include a mismatch of low-cost generation to load in the Upper Peninsula and aging facilities in poor or obsolete condition.



Zone 2 includes the counties of:

- Alger, Mich.
- Baraga, Mich.
- Chippewa, Mich.
- Delta, Mich.
- Dickinson, Mich.
- Florence, Wis.
- Forest, Wis. (northern portion)
- Gogebic, Mich. (eastern portion)
- Houghton, Mich.
- Iron, Mich.
- Keweenaw, Mich.
- Luce, Mich.
- Mackinac, Mich.
- Marinette, Wis. (northern portion)
- Marquette, Mich.
- Menominee, Mich. (northern portion)
- Ontonagon, Mich. (eastern portion)
- Schoolcraft, Mich.
- Vilas, Wis. (northern portion)



ern Wisconsin

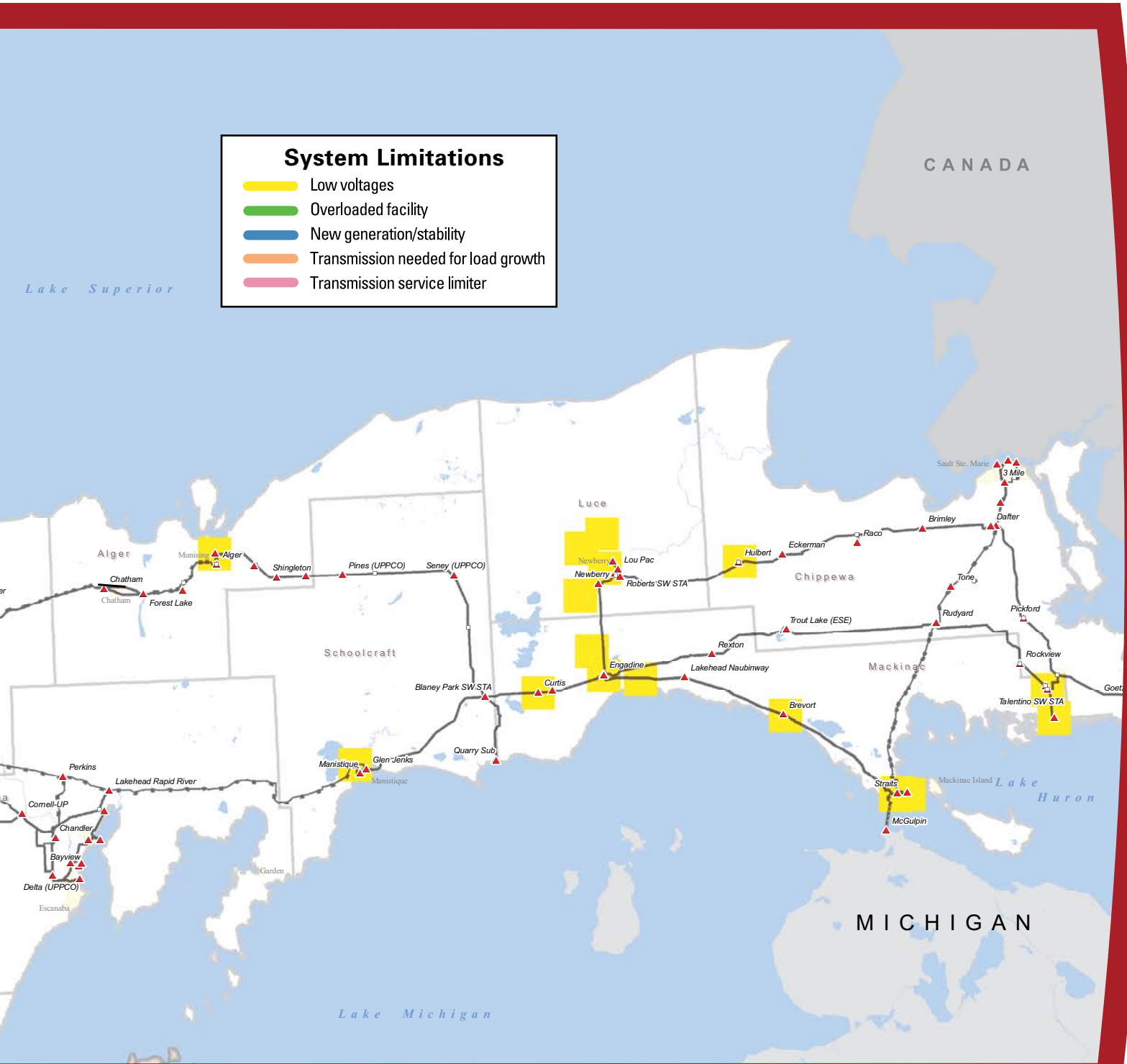
Transmission system limitations in Zone 2

In the 2007 analysis of Zone 2, we identified low voltages, transmission facility overloads and transmission service limitations. In addition, heavily loaded facilities during off-peak periods, especially when the Ludington Pumped Storage Facility in Lower Michigan is pumping, continue to keep the system working with very small operating margins.

Areas in the western and far eastern Upper Peninsula are most vulnerable to low voltages. The most notable areas experiencing

transmission service limitations include the Plains-Stiles 138-kV line and the Hiawatha-Indian Lake 69-kV line. Both of these lines were addressed for the near term with projects completed in 2006.

The potential for generation at Presque Isle Power Plant becoming unstable after certain disturbances on the transmission system has been a long-standing limitation and the reason for an automated tripping scheme in place at Presque Isle. We are evaluating alternatives to this complex scheme.

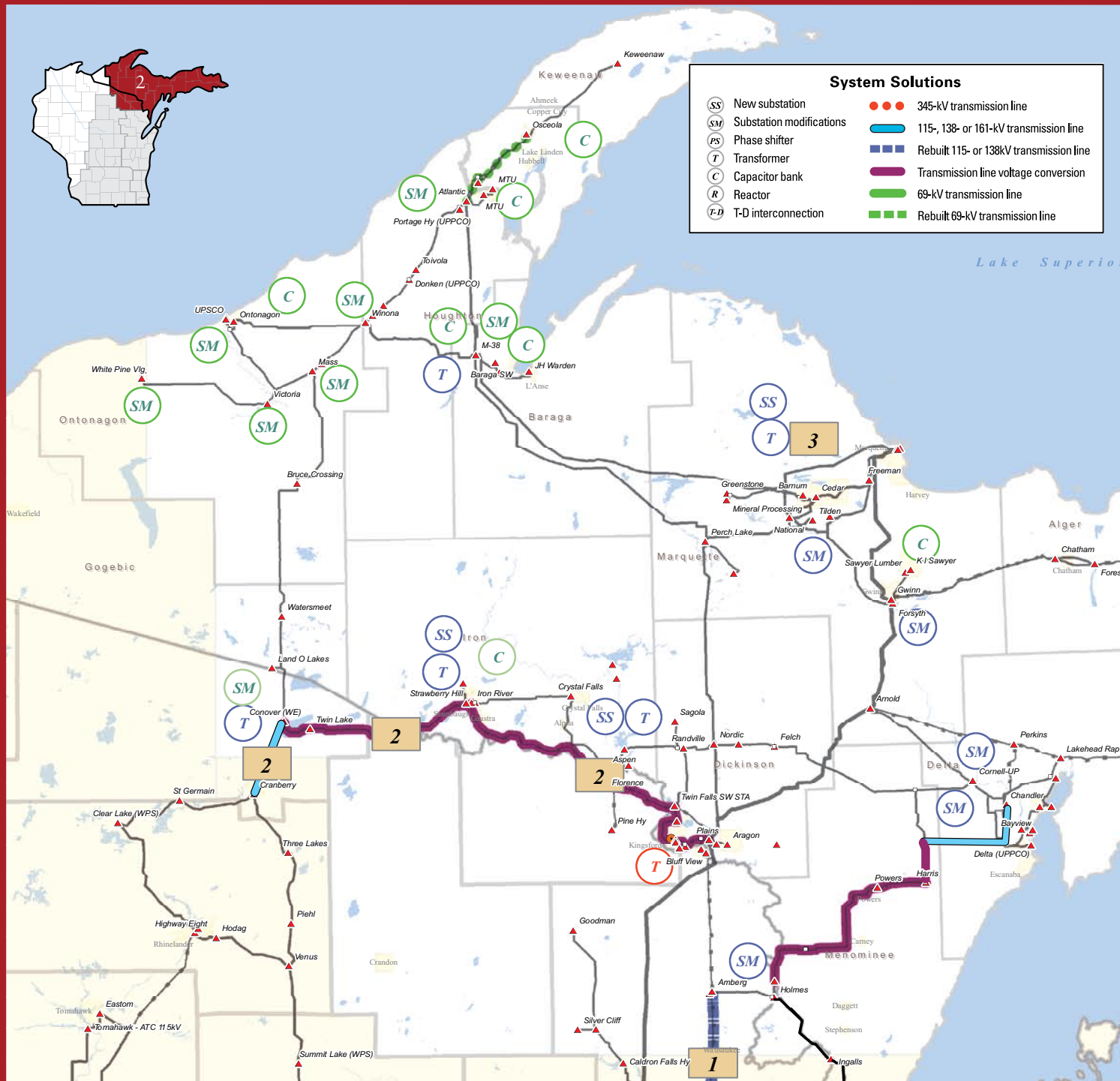


Zone 2 – Michigan’s Upper Peninsula and North

Transmission projects in Zone 2

ATC completed one project in Zone 2 since the 2005 Assessment Update. This involved rebuilding the Hiawatha-Indian Lake 69-kV line to double-circuit 138-kV standards. Initially, one circuit is being operated at 69 kV, but a project to convert both circuits to 138-kV operation is being considered for the 2010 timeframe

Our current plans in Zone 2 include more than 40 projects between 2006 and 2016 to address issues. These projects are in various stages of development. The most notable planned, proposed and provisional projects in Zone 2, along with their projected year of completion and the factors driving the need for the projects, are listed at right. In-service years designated as “TBD” mean we are developing the appropriate project completion date.

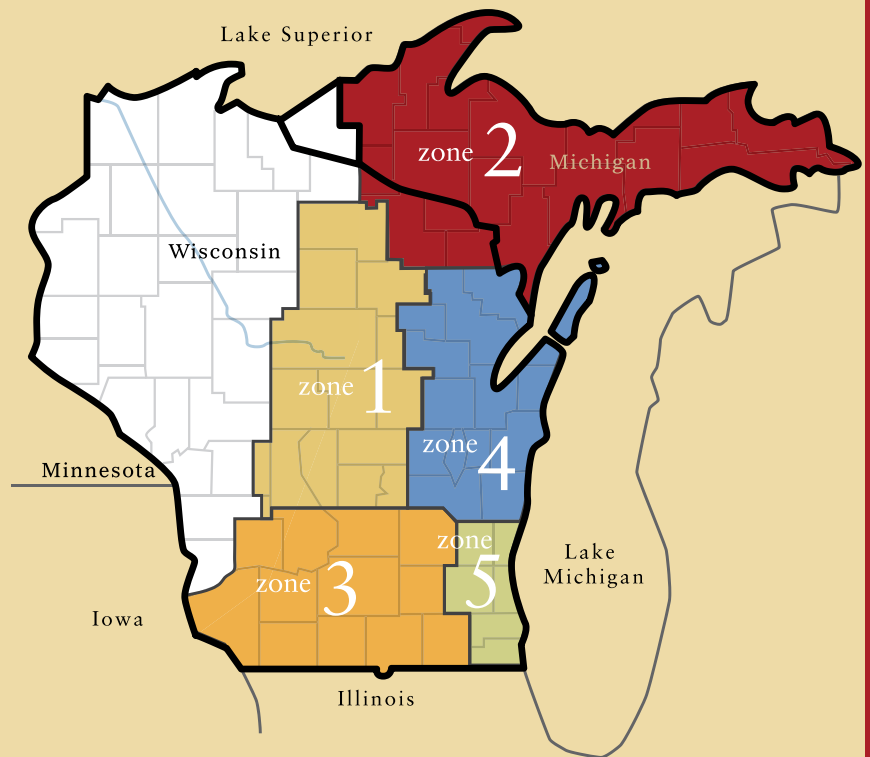


	Project description	In-service year	Need driver
Planned projects			
1	Stiles-Amberg double-circuit 138-kV line rebuild	2006	Improves reliability, helps increase import capability, reduces reliance on operating guides, lowers system losses
2	Cranberry-Conover 115-kV line and Conover-Iron River-Plains rebuild & conversion to 138 kV	2008	Part of Cranberry-Conover project (Zone 1) for Rhinelander Loop, improves voltage profile in the area, addresses aging facilities with condition issues
Proposed projects			
3	Relocate Cedar Substation (North Lake)	2008	Improves reliability in the area, addresses aging facilities in poor condition
4	Hiawatha-Pine River 69-kV line rebuild & conversion to 138 kV	2009	Addresses potential overloads of existing lines in the area, addresses aging facilities in poor condition, improves voltage profile in the area, accommodates future expansion in the area
Provisional projects			
5	Convert Hiawatha-Indian Lake double-circuit 69-kV line to 138-kV operation	TBD	Addresses chronic transmission service limitation, improves voltage profiles in the area, enhances value of another provisional project
6	Replace the existing Straits Substation (Mackinac)	TBD	Improves reliability in eastern UP, addresses substation facilities in poor condition, provides for future expansion
7	Blaney Park-Munising 69-kV line rebuild & conversion to 138 kV	2012	Addresses low voltages in the area, improves stability of Presque Isle generation, addresses aging facilities in poor condition



ATC at a glance

- Formed in 2001 as the first multi-state, **transmission-only utility**.
- Owner and operator of approximately **8,900 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.
- **\$1.5 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.



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

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