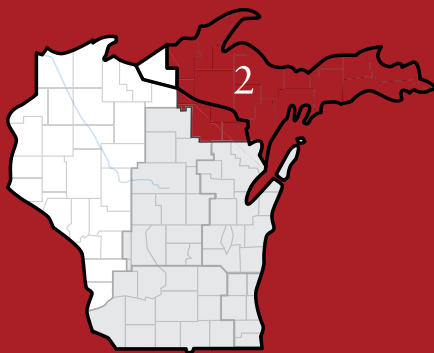




Helping to **keep the lights on**,
businesses running and
communities strong®

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



Zone 2 – Michigan's Upper Peninsula and Northern Wisconsin

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)



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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Michigan's Upper Peninsula and Northern Wisconsin – Zone 2

Electric System Overview

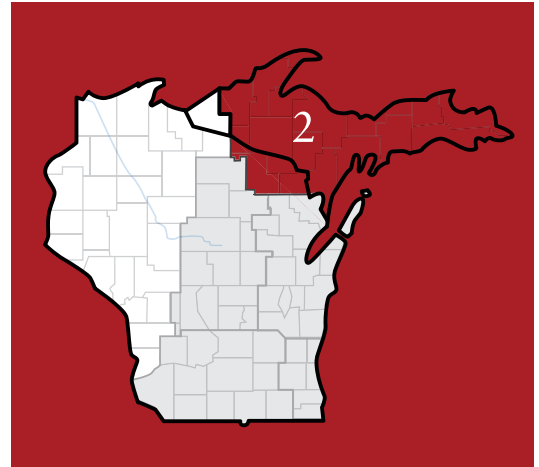
Small increases in population, employment

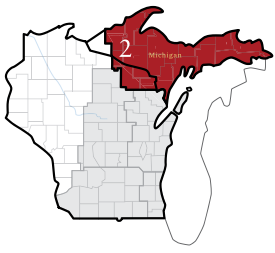
Population in Zone 2 is projected to grow about 0.2 percent annually between now and 2020, and employment is expected to grow about 0.8 percent each year in the same time period. Marquette County is projected to realize the largest increase in employment, while Luce County is projected to have the highest growth rate.

Electricity usage growing

Zone 2 typically experiences peak electric demand during the winter months. Ore mining and paper mills are the largest electricity users in the zone.

Electric load is projected to increase by 0.59 percent annually through 2020.





System Limitations Michigan's Upper Peninsula and Northern Wisconsin – Zone 2

Transmission system characteristics of Zone 2

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

- ▶ Morgan-Plains and Plains-Dead River 345-kV lines,
- ▶ Plains-Stiles 138-kV double-circuit line
- ▶ Conover-Plains 138-kV line, and
- ▶ 138-kV facilities tying the Upper Peninsula of Michigan to the Lower Peninsula.

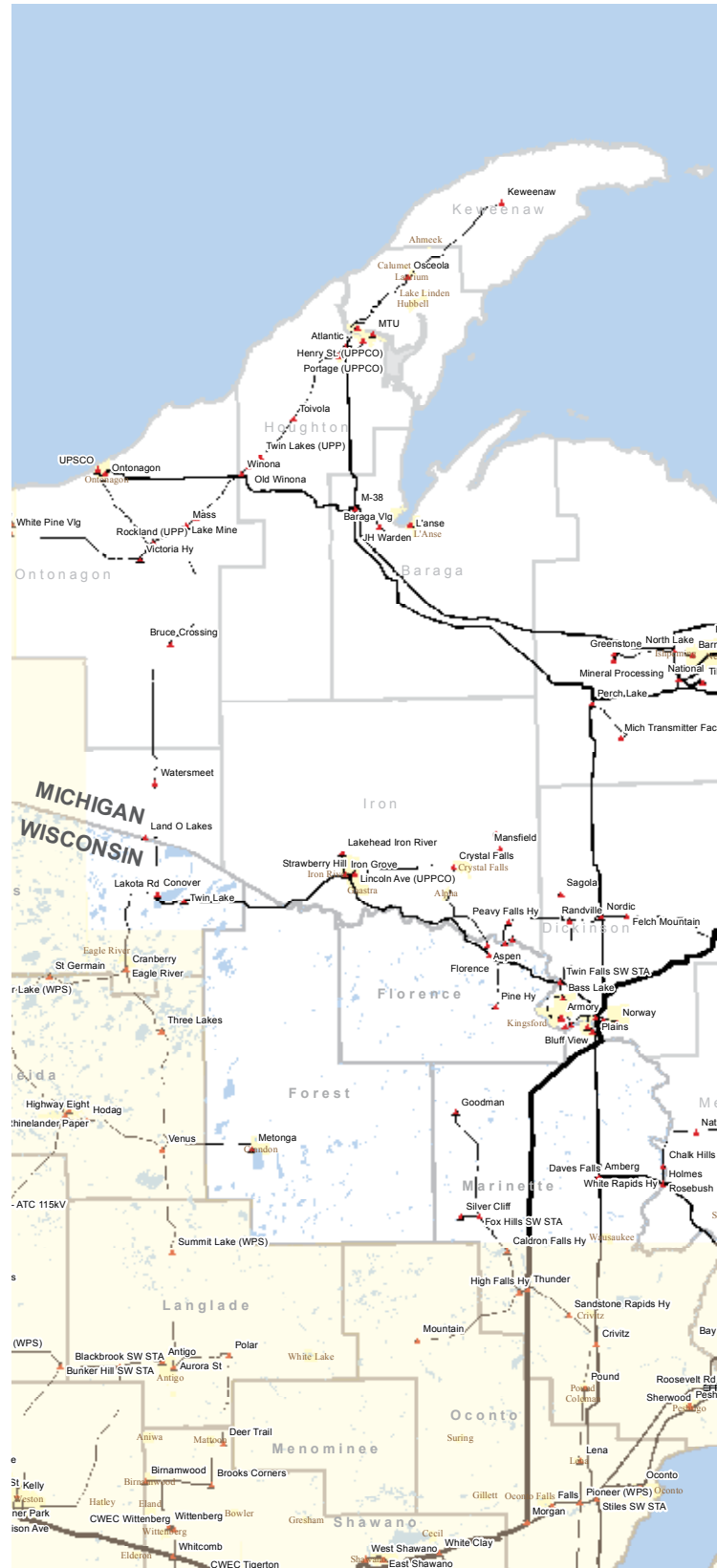
There are a number of transmission system performance issues in Zone 2 including limited ability to import or export power, generator instability, overloaded lines and equipment, low system voltages and chronic limitations to transmission service. Primary drivers of these issues include a mismatch of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

Our recently completed northern umbrella plan projects (Cranberry-Conover-Plains) began to address some of the identified issues, but efforts to upgrade the area are ongoing. To vet our planning assumptions for the intermediate- and long-term periods, we've engaged stakeholders in a collaborative process (known as the ATC Energy Collaborative – Michigan) to examine the bounds of several plausible futures. Please refer to www.atc10yearplan.com, ATC Energy Collaborative – Michigan for details.

Transmission system limitations in Zone 2

In the analysis of Zone 2, we identified low voltages, transmission facility overloads and transmission service limitations. In addition, heavily loaded facilities during off-peak periods continue to keep the system working with very small operating margins.

The potential for generation at Presque Isle Power Plant becoming unstable after certain disturbances to the transmission system has been a long-standing limitation and the reason for an automated tripping scheme in place at the plant. We are continuing to evaluate alternatives to this complex scheme. As part of the ATC Energy Collaborative – Michigan, we are also evaluating potential generation retirement scenarios. Please refer to www.atc10yearplan.com, ATC Energy Collaborative – Michigan for details.



Zone 2 includes the counties of:

ALGER, MICH.

FLORENCE, WIS.

IRON, MICH.

MARINETTE, WIS.

ONTONAGON, MICH.

BARAGA, MICH.

FOREST, WIS.
(northern portion)

KEWEENAW, MICH.

(northern portion)

(eastern portion)

CHIPPEWA, MICH.

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(eastern portion)

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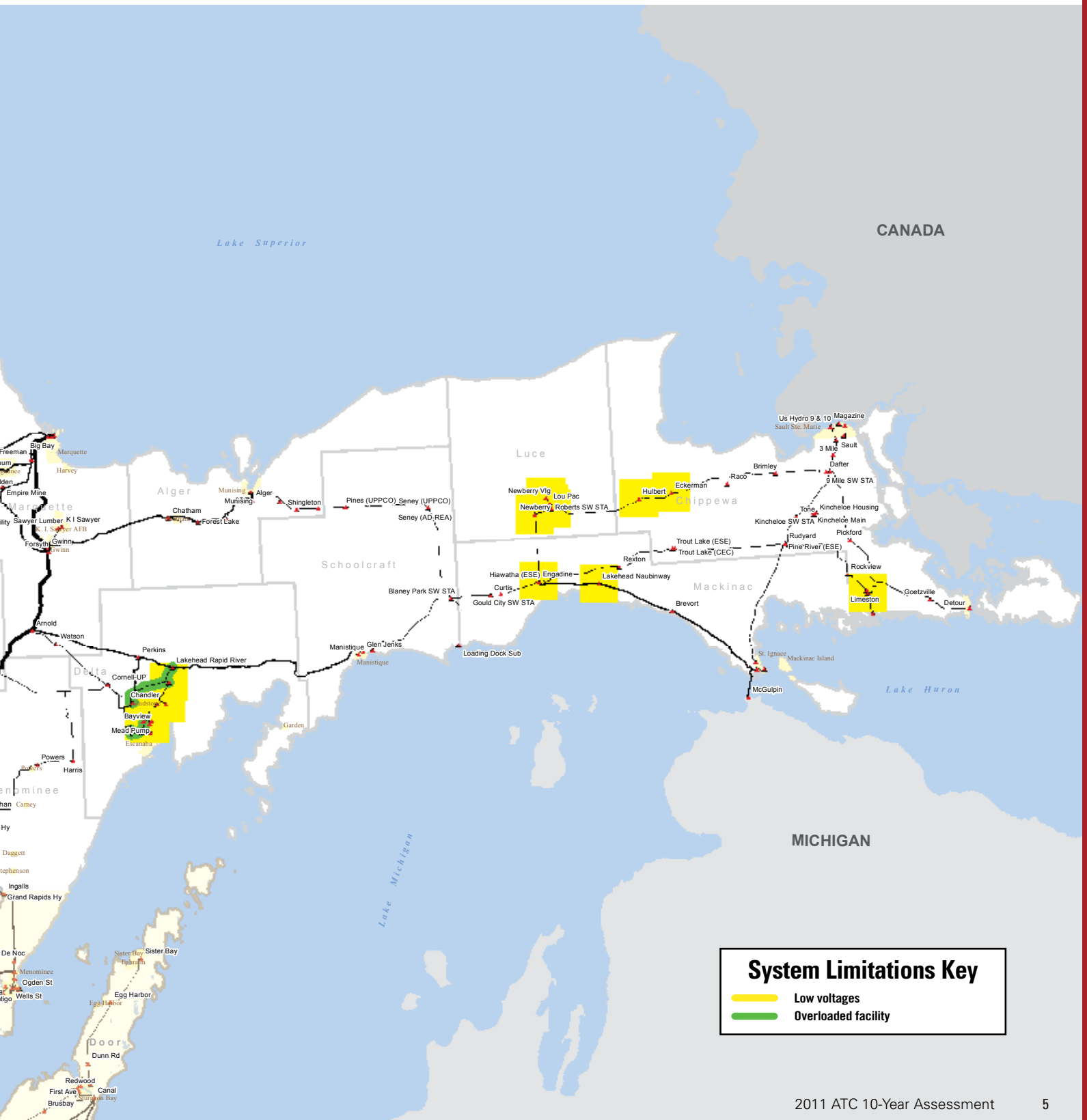
HOUGHTON, MICH.

MACKINAC, MICH.

MENOMINEE, MICH.
(northern portion)

VILAS, WIS.
(northern portion)

DICKINSON, MICH.



System Limitations Key

- Low voltages
- Overloaded facility

Transmission projects in Zone 2

Michigan's Upper Peninsula and Northern Wisconsin – Zone 2



Transmission projects in Zone 2

We have implemented two projects in Zone 2 since the 2010 Assessment, including the installation of reactors at the Straits Substation.

Our current plans in Zone 2 include 13 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 2, along with their projected year of completion and the factors driving the need for the projects, are listed at right.

We also are working on a package of projects (a Northern Plan) that coordinate with existing plans to address generation changes, load changes and developing transmission contingency issues. This plan also will affect infrastructure development in Zones 1 and 4.

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.



System Solutions Key

SUBSTATION KEY

- SS** New substation
Supports transmission system expansion
- SM** Substation modifications
Upgrades equipment ratings to avert facility overload
- 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

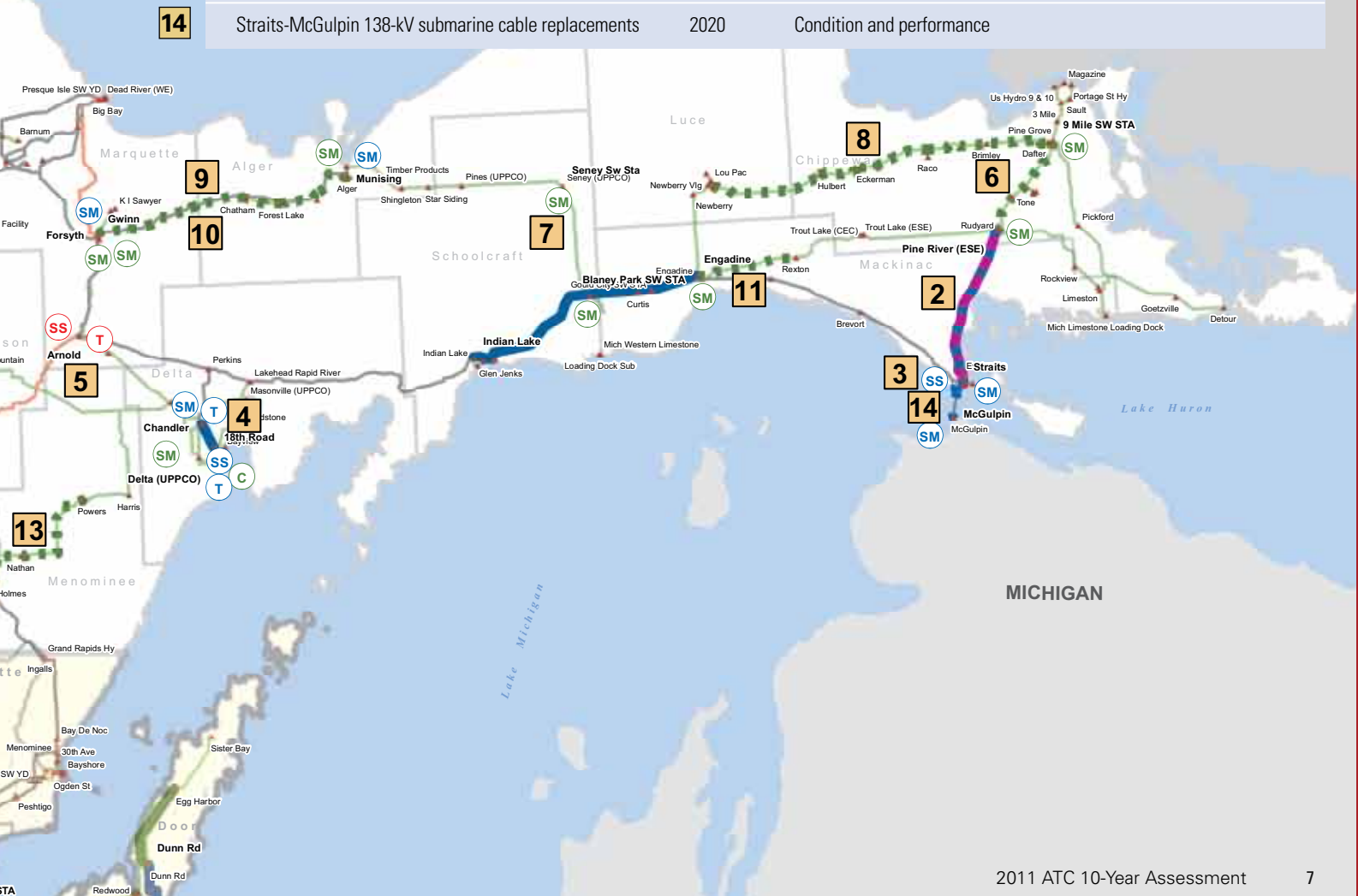
TRANSMISSION LINE KEY

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

	Project description	In-service year	Need driver
Planned projects			
1	Atlantic-M38 69-kV line rebuild	2013	Overloads, low voltages, condition and performance
Proposed projects			
2	Straits-Pine River 69-kV double circuit rebuild	2014	Overloads and low voltages
3	Mackinac 138-kV Substation; Install back-to-back HVDC flow control device	2014	Address/Control flow across eastern U.P., overloads and low voltages
4	Chandler-18th Road 138-kV double circuit lines	2014	Overloads and low voltages
5	Arnold 345-kV Substation and 345/138-kV transformer	2015	Overloads and low voltages
6	Pine River-Nine Mile 69-kV line uprate and asset renewal	2016	Overloads, condition and performance
Provisional projects			
7	Munising-Seney-Blaney Park 69-kV line uprate	2014	Overloads, low voltages, condition and performance
Asset Renewal projects			
8	Nine Mile-Roberts 69-kV line partial rebuild	2012	Condition and performance
9	Forsyth-Munising 138-kV line re-insulation	2012	Condition and performance
10	Munising-Gwinn 69-kV line partial rebuild	2012-2013	Condition and performance
11	Rexton-Hiawatha 69-kV line partial rebuild	2015	Condition and performance
12	Conover-Mass 69-kV line partial rebuild	2018	Condition and performance
13	Powers-Chalk Hill 69-kV line partial rebuild	2018	Condition and performance
14	Straits-McGulpin 138-kV submarine cable replacements	2020	Condition and performance





P.O. Box 47
Waukesha, WI 53187-0047



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

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

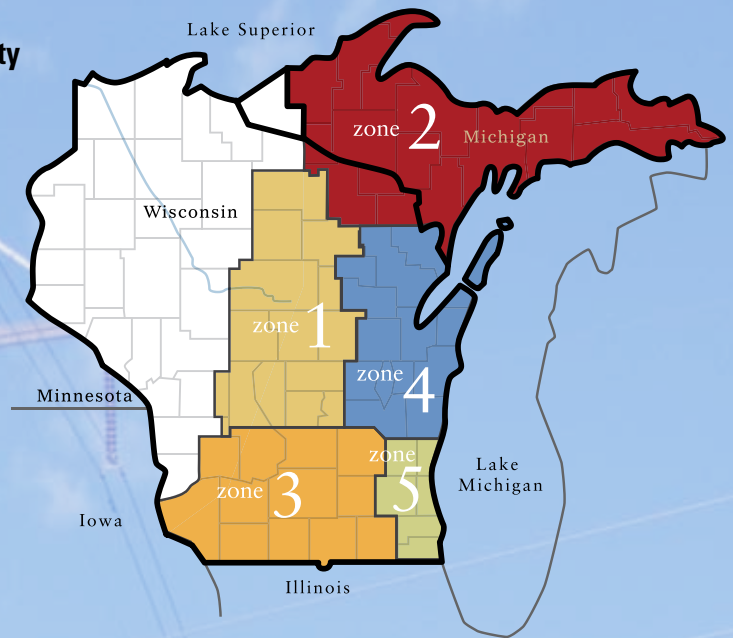
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www.atcllc.com

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

