



CITY COUNCIL/ELECTRICAL
ADVISORY COMMITTEE

August 14, 2013 – 6:00 p.m.
Regular Meeting

CITY COUNCIL

Leo Evans, Mayor
Patricia Baribeau, Mayor Pro-tem
Walter Baker, Council Member
Ronald Beauchamp, Council Member
Mark Tall, Council Member

ADMINISTRATION

James V. O'Toole, City Manager
Robert S. Richards, CMC, City Clerk
Ralph B.K. Peterson, City Attorney
Mike Furmanski, Electrical Superintendent
Michael Dewar, City Controller
Thomas Butz, Power System Engineering

ELECTRICAL ADVISORY COMMITTEE

Tim Wilson, Chairperson
Ann Bissell, Vice Chairperson
Larry Arkens, Committee Member
Glendon Brown, Committee Member
John Anthony, Committee Member
Vacant Seat
Vacant Seat

Escanaba City Council Chambers: 410 Ludington Street - Escanaba, MI 49829

Meeting Agenda

Wednesday, August 14, 2013

CALL TO ORDER
ROLL CALL
APPROVAL/ADJUSTMENTS TO THE AGENDA
CONFLICT OF INTEREST DECLARATION

PUBLIC HEARING

1. Public Hearing – Renewable Energy Plan

Explanation: The public will be given the opportunity to comment on the City of Escanaba's Renewable Energy Plan as required by PA 295.

NEW BUSINESS

1. Update - Electric Department –General Operations.

Explanation: Electrical Superintendent Mike Furmanski will update the City Council, Electrical Advisory Committee and Citizens of Escanaba on the current departmental activities.

2. Update– Operation and Maintenance of Power Plant – Pro Energy Services, Inc.

Explanation: Pro Energy Services, Inc. will update the City Council, Electrical Advisory Committee and Citizens of Escanaba on the status of the operation and maintenance of the power plant.

3. Presentation – American Transmission Company.

Explanation: Brett French, Regional Manager – External Relations, Michigan, will present an update on ATC's projects in the area.

4. Update – Power Plant Purchase Agreement.

Explanation: Administration will provide an update on the status of power plant purchase agreement between the City of Escanaba and Escanaba Green Energy, LLC.

5. Update – Energy Update.

Explanation: Administration will discuss the steps that may need to be taken regarding the future of the Escanaba Generating Station. The discussion will include factors that can impact our decisions going forward, such as the timing of the plant sale, the SSR agreement, timing of a possible referendum, timing of filing a new Attachment Y with MISO.

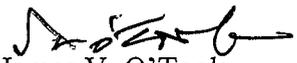
GENERAL PUBLIC COMMENT

COMMISSION/STAFF COMMENT AND ANNOUNCEMENTS

ADJOURNMENT

The City of Escanaba will provide all necessary, reasonable aids and services, such as signers for the hearing impaired and audiotapes of printed materials being considered at the meeting to individuals with disabilities at the meeting/hearing upon five days notice to the City of Escanaba. Individuals with disabilities requiring auxiliary aids or services should contact the City of Escanaba by writing or calling City Hall at (906) 786-9402.

Respectfully Submitted,


James V. O'Toole
City Manager

OFFICIAL PROCEEDINGS
CITY COUNCIL
ELECTRICAL ADVISORY COMMITTEE
CITY OF ESCANABA, MICHIGAN
Special Joint Meeting
Wednesday, July 17, 2013

Pursuit to a meeting notice posted June 21, 2013, the meeting was called to order by the Mayor Leo J. Evans at 6:00 p.m. in the Council Chambers of City Hall located at 410 Ludington Street.

Present: Mayor Leo J. Evans, Council Members, Walter A. "Pete" Baker, Patricia A. Baribeau, Ronald J. Beauchamp, and Marc D. Tall.

Absent: None

Present: Electrical Advisory Committee (EAC) Members: Chairperson Tim Wilson, Jon Anthony, Larry Arkens, and Ann Bissell.

Absent: Electrical Advisory Committee Members: Glendon Brown, Two vacancies and Power Plant Liaison

Also Present: City Manager James V. O'Toole, Electric Superintendent Mike Furmanski, City Controller Mike Dewar, City Attorney Ralph B.K. Peterson, Pro Energy Escanaba Power Plant Manager Jack Scott, Escanaba Green Energy (EGE) representative Charles DeTiege, and members of City Administration, the public, and Media.

Beauchamp moved, Tall seconded, **CARRIED UNANIMOUSLY**, to approve the agenda as submitted.

UNFINISHED BUSINESS - None

CONFLICT OF INTEREST - None

PUBLIC HEARING - None

NEW BUSINESS

Update - Electric Department –General Operations.

Electrical Superintendent Mike Furmanski updated the City Council, Electrical Advisory Committee and Citizens of Escanaba on the current departmental activities.

- Did trial runs on the LED street lights;
- Fox Power did 30 pole change outs;
- Crews busy with new work;
- Commercial services coming up.

Update– Operation and Maintenance of Power Plant – Pro Energy Services, Inc.

Pro Energy Services, Inc. updated the City Council, Electrical Advisory Committee and Citizens of Escanaba on the status of the operation and maintenance of the power plant.

- Plant did not operate month of June;
- No accidents or injuries were reported for the month of June;
- Plant is running right now, both units;
- An accident occurred this morning. Individual was treated at hospital and released.

Update – Power Plant Purchase Agreement.

Administration provided an update on the status of power plant purchase agreement between the City of Escanaba and Escanaba Green Energy, LLC.

- Escanaba Green Energy (EGE) representative Charles DeTiege provided an update on EGE's financing;
- EGE was no longer working with it's financial lender Provartis. EGE was currently working with its new lender Black Diamond Investments out of New Jersey on a \$36.5 million dollar loan;
- Loan was increased from \$30 million to \$36.5 million due to money lost with Provartis and funding delays;
- Royal Bank was doing the \$1 million dollar five year loan deposit to kick off loan;
- Royal Bank was sending Terms and Conditions for the \$1 million dollar loan this Friday. If agreed, closing date would be 30 to 45 days after it was sent back to Royal Bank;
- DeTiege thanked Tim Kobasic who met with himself and City Treasurer Bob Valentine to discuss the use of City funds to secure initial.

Discussion – Senate Bill 284 – Low-Income Energy Assistance Fund.

Administration led a discussion concerning the passage of Senate Bill 284 which created the Low-Income Energy Assistance Fund. Under the requirements of the law, the City could collect up to \$1 per month on each electric utility account which would then be used to assist low-income customers in paying their bill. However, the City can opt out provided certain conditions were met. A decision to opt out must be made by July 23, 2013.

- Charge would be \$.91 per residential site per month;
- As of today there were 5,864 residential meters, or a \$64,000 a year;
- Postage would double in price to send out utility bills;
- Would become an expense to the City of Escanaba to change our billing system;
- Can review and opt in at a later date.

After discussion, Baribeau moved, Beauchamp seconded, to opt out of the Low-Income Energy Assistance Fund.

Upon a call of the roll, the vote was as follows:

Ayes: Baribeau, Beauchamp, Baker, Tall, Evans

Nays: None

MOTION CARRIED.

Discussion – Power Plant Future.

Administration discussed the steps that may need to be taken regarding the future of the Escanaba Generating Station. The discussion included factors that could impact decisions going forward, such as the timing of the plant sale, the SSR agreement, timing of a possible referendum, and timing of filing a new Attachment Y with MISO.

- Moving forward on the new SSR Agreement and anticipating no issue;
- Administration reviewed proposed draft referendum language, which still would allow the City to sell the Power Plant.

GENERAL PUBLIC COMMENT - None

COUNCIL/COMMITTEE, STAFF REPORTS

- Manager O'Toole stated at the next regular scheduled meeting of the City Council and EAC, Brett French from ATC would be present to provide an update on the final construction plans on the Day Light Savings project coming to Escanaba;
- Heard from the community what a fine job everybody did for the Esky 150;
- Thanked the Electrical Advisory Committee for serving.

ADJOURNMENT

Hearing no further public comment, or further reports from the Electrical Advisory Committee or Council, the meeting adjourned at 6:48 p.m.

Respectfully submitted,

Robert S. Richards, CMC
City Clerk

Approved: _____
Leo J. Evans, Mayor

PH#1
cc 8/14/13

**ESCANABA
ELECTRIC DEPARTMENT
RENEWABLE ENERGY PLAN
U-16611**

June, 2013

- Based on this Renewable Energy Plan (REP) the Escanaba Electric Department (City) will have the required Renewable Energy Credits (RECs) for the REP time period of 2013-2029 thereby complying with PA 295.
- The primary source of RECs comes from the purchase of RECs from others.
- The City periodically enters into discussions with developers of renewable energy generation project. It is possible that a future source of RECs will be acquired through a specific project either owned by the City or through some other type of business arrangement with the developer.
- Earlier REPs estimated the cost of RECs for years 2012 -2015 at a cost higher than actual transacted costs. This situation caused a temporary overcharging of the City's customers. Therefore, the City stopped charging surcharges and used the surplus to purchase additional RECs or apply to future renewable energy projects. The City will not assess any more surcharges until the surplus is gone.
- The City has chosen to use the Cost of RECs method of calculating the incremental cost of compliance rather than the Transfer Price method.
- The City will not exceed the renewable energy surcharge caps specified in PA 295.
- The financial impact of this REP is expected to be minimized for the City's customers.
- The City will comply with Section 45 and 51 of PA 295 which refers to methods of notification to customers charges, if any, for costs associated with its REP.



BACKGROUND INFO
NB # 3

received
7/5/13 Jro

CC/EAC
8/14/13

MAILING ADDRESS: P.O. BOX 47 ■ WAUKESHA, WI 53187-0047
STREET ADDRESS: W234 N2000 RIDGEVIEW PARKWAY COURT ■ WAUKESHA, WI 53188-1022
PHONE: 262.832.8629 ■ FAX: 262.506.6124 ■ www.atcllc.com

June 27, 2013

Robert Richards
City of Escanaba Clerk
410 Ludington St, C10
Escanaba, MI 49829

Re: Bay Lake/Holmes to Old Mead Road 138 kV Transmission Line Project

Dear Robert Richards:

American Transmission Company has proposed to construct a new 138 kV transmission line connecting the Holmes Substation in Menominee County with the Old Mead Road Substation in Delta County to improve electric reliability in the region. ATC has designated a proposed and alternate route to be considered by the public and to be included in an application to the Michigan Public Service Commission (MPSC) later this year.

ATC has prepared and filed with the MPSC a Construction Plan that discusses the proposed and alternate routes for the transmission line. Consistent with Michigan law, ATC has attached a copy of this Construction Plan for your convenience.

Please contact me if you have any questions.

Very truly yours,

Trevor D. Stiles
Senior Counsel
ATC Management Inc.
Corporate Manager for
American Transmission Company LLC

**STATE OF MICHIGAN
BEFORE THE
MICHIGAN PUBLIC SERVICE COMMISSION**

In the matter of the application of ATC Management)
Inc. and American Transmission Company LLC for a)
certificate of public convenience and necessity for the)
construction of a transmission line between Holmes)
Substation in Menominee County and Old Mead)
Substation in Delta County, Michigan.)

Docket No. U-17272

CONSTRUCTION PLAN

1. Pursuant to the Electric Transmission Line Certification Act, 1995 PA, MCL 460.561 *et seq.*, (the Act or Act 30), §4(1), as amended, M.C.L. § 460.564(1), American Transmission Company LLC and ATC Management Inc., its corporate manager (collectively, ATC), respectfully submit this Construction Plan to the Michigan Public Service Commission (Commission). ATC is proposing to construct a new, approximately 58-mile, 138 kV transmission line and associated transmission facilities running from the existing Holmes Substation in Holmes, Michigan to the new Old Mead Road Substation in Escanaba, Michigan, as identified in the map attached as Attachment 1 (referred to as the "Holmes to Old Mead Road Project" or "Project"). Section 4 of the Act provides, in pertinent part, as follows:

(1) If an . . . affiliated transmission company . . . plans to construct a major transmission line in this state in the 5 years after planning commences, the . . . affiliated transmission company . . . shall submit a construction plan to the commission. . . .

A plan shall include all of the following:

(a) The general location and size of all major transmission lines to be constructed in the 5 years after planning commences.

(b) Copies of relevant bulk power transmission information filed by the . . . affiliated transmission company . . . with any state or

federal agency, national electric reliability coalition, or regional electric reliability coalition. . . .

(2) At the same time the . . . affiliated transmission company . . . submits a construction plan to the commission under subsection (1), the . . . affiliated transmission company . . . shall provide a copy of the construction plan to each municipality in which construction of the planned major transmission line is intended.

2. While ATC's Holmes to Old Mead Road Project does not qualify as a "Major Transmission Line" because it is designed and will be operated as a 138 kV line, ATC has elected to file an application for a certificate of public convenience and necessity (CPCN) with the Commission. Further, while ATC realizes that § 9 of the Act obviates the need to file a Construction Plan, ATC has elected to do so to provide full notice to the affected municipalities and other interested parties. Accordingly, ATC respectfully submits this Construction Plan.

3. Pursuant to § 4(1) of the Act, this submission constitutes ATC's Construction Plan for the Holmes to Old Mead Road Project generally running from and through Harris, Holmes, Meyer, Nadeau, and Spalding Townships, and the Village of Powers in Menominee County. The proposed Project will also traverse Bark River, Escanaba, Ford River, and Wells Townships, and the City of Escanaba in Delta County. In addition to the municipalities listed, ATC's Alternate Route for the Project, identified in Attachment 2, below, runs through Faithom Township in Menominee County.

4. Pursuant to § 4(1)(a) of the Act, with respect to the general location and size of transmission lines to be constructed in the 5 years after planning commences, ATC proposes to construct the Holmes to Old Mead Road Project a new, approximately 58-mile, 138 kV transmission line running from Holmes, Michigan to Escanaba, Michigan. More specifically, the proposed Project's location is described as follows:

5. The proposed Holmes to Old Mead Road Project is a new, approximately 58-mile long, 138 kV transmission line and associated facilities that terminates at ATC's Holmes Substation, located in Holmes Township, Michigan and the new Old Mead Road Substation, located in Escanaba, Michigan. The proposed Project will be co-located with 30.5 miles of an existing 69 kV overhead single circuit line and 0.8 miles of existing 138 kV overhead single circuit line, both rebuilt to overhead double circuit line configuration. The remaining 26.7 miles of the proposed Holmes to Old Mead Road Project is new 138 kV overhead single circuit line configuration. The proposed Project for either the double or single circuit line configuration will include a right-of-way (ROW) of approximately 80-100 feet to accommodate the new transmission facilities. The proposed Project begins at ATC's Holmes substation, located in Holmes Township, Menominee County, Michigan, and proceeds east, following an existing electric transmission line and property lines for approximately 1.2 miles to an intersection at County Road 356. From here, the proposed Project turns to the north and proceeds for approximately 2.8 miles to the intersection at Chalk Hill Road. At this point, the Project turns and travels to the west along Chalk Hill Road for approximately 1.6 miles to the intersection at an existing ATC electric transmission line. The proposed Project then turns and generally heads to the north and east, following the existing transmission line for approximately 24.6 miles, crossing through the Holmes, Nadeau, Meyer, and Spalding Townships, and the Village of Powers. From this point, the proposed Project generally follows existing roads and property lines to the north for approximately 2.0 miles to the intersection at an existing abandoned railroad. The Project then turns and generally heads to the east, following the abandoned railroad for approximately 19.9 miles, crossing through Spalding, Harris, Bark River, Ford River, and Wells Townships, and the City of Escanaba. From here, the proposed Project leaves the

abandoned railroad and generally travels to the east and north following existing electric transmission line for approximately 5.9 miles to its terminus at the new Old Mead Substation in the City of Escanaba, Delta County, Michigan.

In addition, to the proposed Project, ATC has identified several route options that would provide a route option to the Proposed Project route if certain permitting conditions are not obtained prior to filing the CPCN application with the State of Michigan. Specifically, these areas include a route option in Holmes Township that travels north and follows property lines from Chalk Hills Road. This route provides an option to the proposed route through an area of Federal Energy Regulatory Commission (FERC)-regulated hydro-related lands.

Additionally, ATC has included a route option along the along the portion of the Project that follows the abandoned railroad through Hannahville Indian Reservation and Tribal lands in Spalding and Harris Townships. This option would generally follow property lines to the north and east if the route through tribal lands cannot be secured.

A third route option, also along the abandoned railroad, extends south and east of the railroad to avoid existing residential congestion in Harris and Bark River Townships. This route option would only be utilized in the event that the proposed Project is unable to share the existing abandoned railroad ROW.

6. Included with this Construction Plan is Attachment 1, a map of the Proposed Route, and Attachment 2, a map of the Alternate Route.

7. Pursuant to § 4(1)(b) of the Act, ATC must include with the Construction Plan copies of relevant bulk power transmission information filed by ATC with any state or federal agency, national electric reliability coalition, or regional electric reliability coalition. ATC

annually produces a 10-Year Transmission System Assessment based on engineering studies of the transmission system looking for potential problems that may affect the future performance of the system. This assessment details ATC's annual review of its transmission system to identify and prioritize projects needed to improve the adequacy and reliability of the transmission system. ATC has attached a copy of its most recent version of the 10-Year Plan as Attachment 3. ATC maintains its current version of the assessment online at <http://www.atc10yearplan.com>.

8. Absent other considerations, complying with § 4(1)(b) of the Act would require ATC to include its 2013 FERC Form 715 — Annual Transmission Planning and Evaluation Report for ATC. FERC considers Form 715 submissions to be Critical Energy Infrastructure Information (CEII), however, and, for national security reasons, FERC has mandated special treatment for such information. ATC's Form 715 is not available on FERC's eLibrary website but is instead protected as CEII.

9. In view of the above, ATC is not attaching a copy of its 2013 FERC Form 715. Interested individuals may contact FERC's Public Information Reference Room at 202-502-8371 or toll free at 866-208-3676. If assistance is required, interested persons may contact the undersigned counsel for ATC.

10. Pursuant to § 4(2) of the Act, concurrently with ATC's submission of the Construction Plan to the Commission, ATC is providing a copy of the Construction Plan to the municipalities listed in paragraph 3, above, as well as both Menominee County and Delta County.

11. Pursuant to § 5 of the Act, ATC intends to submit an application to the Commission for a CPCN for the Holmes to Old Mead Road Project in October 2013.

12. Pursuant to § 6 of the Act, ATC intends to offer in writing to meet with the chief elected official of each affected municipality and county and to schedule and to hold a public meeting in each municipality affected by the Project.

Respectfully submitted,

AMERICAN TRANSMISSION COMPANY LLC
and ATC MANAGEMENT INC.

Sherri A.

Digitally signed by: Sherri A. Wellman
DN: CN = Sherri A. Wellman C = AD
O = MillerCanfield
Date: 2013.06.26 11:05:58 -04'00'

Dated: June 27, 2013

By: _____

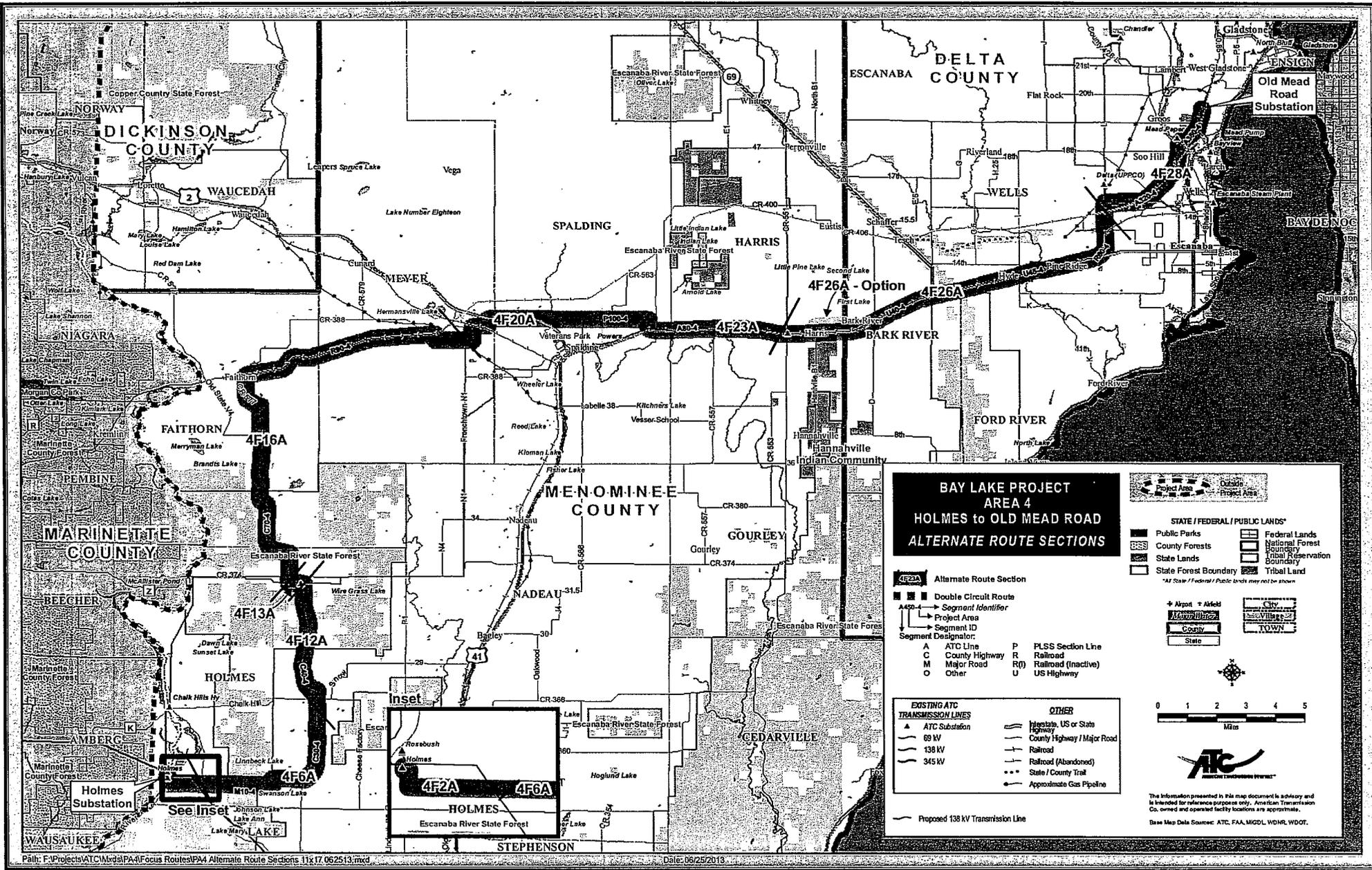
Wellman

Sherri A. Wellman (P38989)
Paul M. Collins (P69719)
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Senior Counsel
ATC MANAGEMENT INC., corporate manager for
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*Attorneys for American Transmission Company LLC and
ATC Management Inc.*

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BAY LAKE PROJECT AREA 4 HOLMES to OLD MEAD ROAD ALTERNATE ROUTE SECTIONS

STATE / FEDERAL / PUBLIC LANDS*

- Public Parks
- County Forests
- State Lands
- State Forest Boundary
- Federal Lands
- National Forest Boundary
- Tribal Reservation Boundary
- Tribal Land

*All State / Federal / Public lands may not be shown

EXISTING ATC TRANSMISSION LINES

- ATC Substation
- 69 KV
- 138 KV
- 345 KV

OTHER

- Interstate, US or State Highway
- County Highway / Major Road
- Railroad
- Railroad (Abandoned)
- State / County Trail
- Approximate Gas Pipeline

Legend:

- Alternate Route Section
- Double Circuit Route
- Segment Identifier
- Project Area
- Segment ID
- Segment Designator

| | |
|------------------|-------------------------|
| A ATC Line | P PLSS Section Line |
| C County Highway | R Railroad |
| M Major Road | R() Railroad (inactive) |
| O Other | U US Highway |

Scale: 0 1 2 3 4 5 Miles

North Arrow

ATC

The information presented in this map document is advisory and is intended for reference purposes only. American Transmission Co. owned and operated facility locations are approximate.

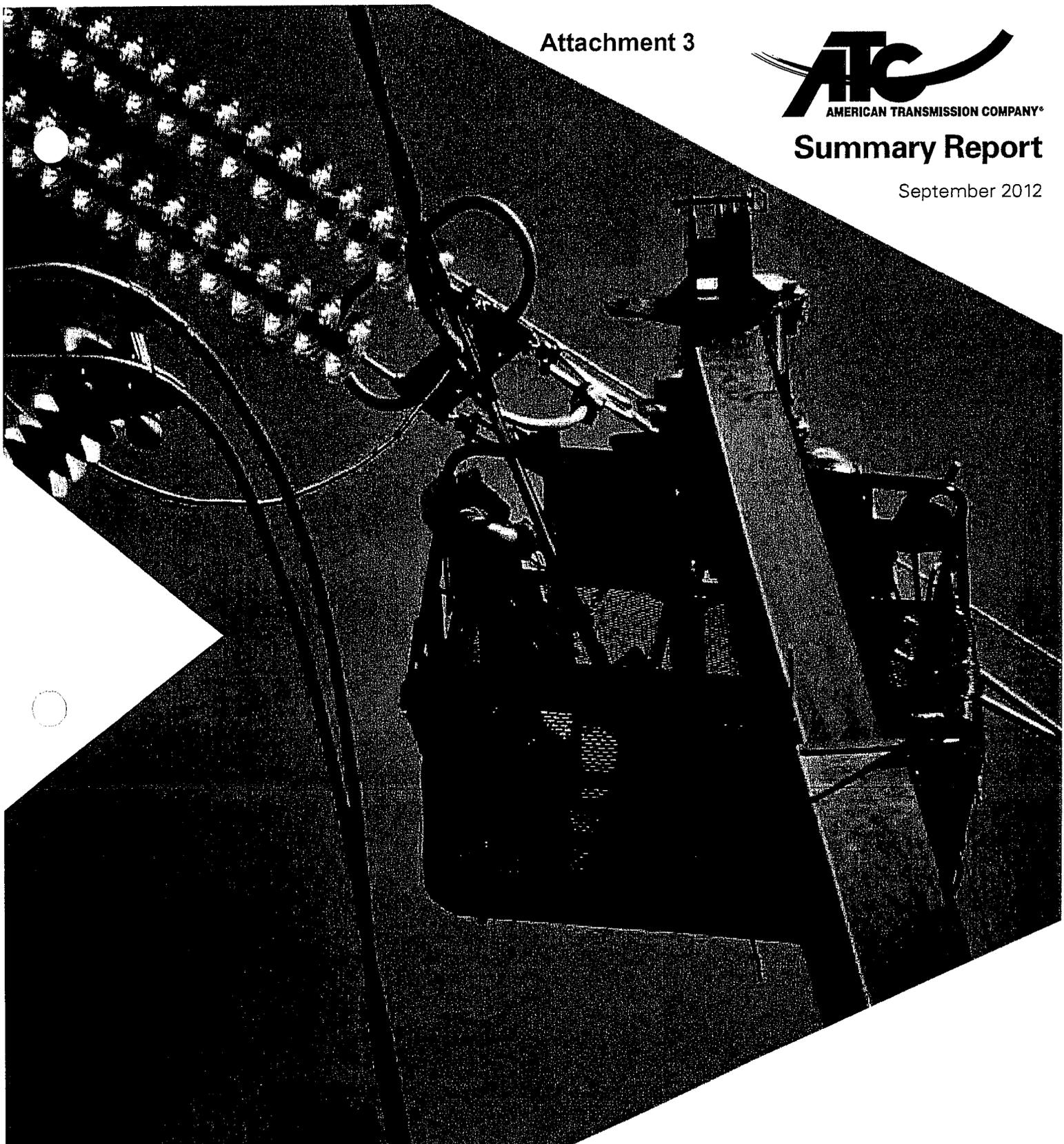
Base Map Data Source: ATC, FAA, MGLD, WDNR, WDOT.

Attachment 3



Summary Report

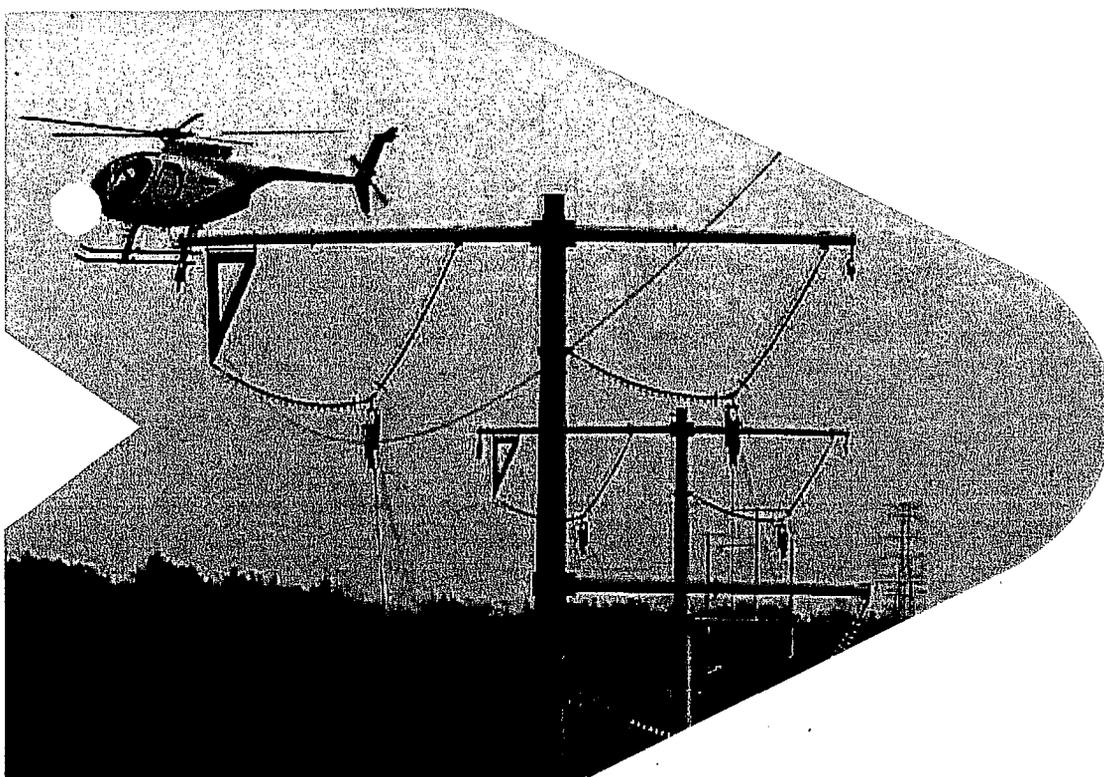
September 2012



The Future Grid

10-Year Transmission System Assessment

www.atc10yearplan.com



Regional and
inter-regional planning
achieves results

Transmission investments solve problems, save money

Since last year's report, industry stakeholders have made progress within the Midwest Independent Transmission System Operator (MISO) and with neighboring systems to more seamlessly plan transmission solutions that reduce congestion and enable public policy initiatives. Wide-scale planning methodologies that improve reliability while providing economic savings and access to renewable energy resources continue to evolve, and American Transmission Co. continues to play a leadership role.

In a major step forward, MISO approved its first portfolio of regional Multi-Value Projects in December 2011. This portfolio was developed using an 18-month value-based planning process with extensive stakeholder involvement to ensure reliability and regional economic benefits commensurate with costs while supporting energy policy mandates. MISO estimates that the average utility customer in the region will see \$23 in benefits from lowered delivered energy costs for about \$11 a year in investment – a 109-percent return. Three of these MVP proposals fall within ATC's service territory. (See page 6 for an update.)

By easing congestion on the system and providing access to lower-cost sources of generation, transmission investments help

Transmission investments The 10-year projections from past and current Transmission System Assessments

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|--------------------------------------|--------|--------|--------|---------------|----------------------|
| Specific Network Projects | \$1.3B | \$1.0B | \$1.0B | \$1.0B | \$1.9B |
| Regional Multi-Value Projects | \$0.0B | \$0.0B | \$0.7B | \$0.7B | \$0.8B |
| Asset Maintenance | \$0.5B | \$0.7B | \$0.7B | \$1.0B | \$1.1B |
| Other Capital Categories | \$0.9B | \$0.8B | \$1.0B | \$1.1B/\$1.7B | \$0.1B/\$1.0B |
| Total 10-Year Capital Cost | \$2.7B | \$2.5B | \$3.4B | \$3.8B/\$4.4B | \$3.9B/\$4.8B |

keep electric rates in check. When the Midwest wholesale energy market was established in 2005, the average locational marginal price (LMP) within our footprint was more than \$10 higher per megawatt hour than the average in neighboring states. In 2011, the LMP was only 10 cents higher. We estimate that of the 13 transmission projects we completed in 2011, 88 percent of the cost will be offset by savings in energy prices over the life of the project.

With reliability needs firmly ensconced as a priority, our planners continue to work with other industry stakeholders to identify and implement solutions for a cost-effective build-out of the regional electricity grid. Smart Grid technologies will increasingly play a role in improving the operator's ability to control the grid as well as to better integrate renewable resources.

Our planning and asset management departments are implementing a new study-based ratings methodology for overhead conductors to better manage operational risk of conductor damage and clearance problems. When ATC began operations in 2001, the company adopted the ratings methodologies of the founding utility companies. Industry benchmarking and recent best practices indicated a need for a review of those methodologies. Since weather is an important factor in the development of transmission line

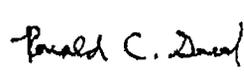
ratings, we contracted with the Electric Power Research Institute to complete a weather parameters study. The new Study-Based Ratings Methodology gives increased confidence that our rating modeling more closely represents actual field conditions.

The 2012 Assessment covers the years 2012 to 2021 and indicates a need for \$3.9 to \$4.8 billion in transmission system improvements. The total includes nearly \$2 billion in specific network projects, \$1.1 billion in asset maintenance and \$0.8 billion in Multi-Value Projects. Other capital categories can include developing projects, unspecified network projects, interconnections and infrastructure relocation.

The planning zone summaries included in this report detail specific projects identified to improve reliability, access to the market and renewable energy resources. A more comprehensive listing of these plans is available at our website www.atc10yearplan.com.



Paul Jett
Director of
Strategic Projects



Ron Snead
Director of
System Planning



Mark Davis
Director of
Asset Management

Regional and economic planning initiatives provide economic benefits, pave way for future grid

While electric reliability has been and always will be the top priority for transmission owners and operators, the interconnected grid has begun to serve other significant energy-related needs. Regional and economic planning increasingly focuses on strategic, purposeful projects that provide local and regional economic and market benefits as well as those that address other factors in play: carbon-reduction initiatives, renewable generation, regulatory changes and aging power plants.

FERC Order 1000

ATC is a participant in stakeholder discussions about MISO's compliance with the Federal Energy Regulatory Commission's Order 1000. Issued in 2011, Order 1000 requires MISO and other regional transmission organizations and transmission providers to plan for public policy requirements such as renewable portfolio standards and EPA regulations. The order requires every RTO to have cost-allocation methodologies for regional and inter-regional projects. The order also removes a right of first refusal, allowing parties other than incumbent utilities to construct certain transmission projects that provide broad benefits, with the costs shared regionally. Much of the stakeholder discussion has centered on which types of projects will be eligible for construction by other developers and how the developers will be selected for those projects. Plans for complying with the order's regional requirements are due in October 2012. The order also requires MISO to coordinate its planning with PJM and other neighboring RTOs and transmission providers, as well as develop cost-allocation methodologies with each neighbor for inter-regional projects.

Proposed inter-regional compliance plans for MISO and each neighboring region are due to FERC in April 2013.

Eastern Interconnection Planning Collaborative

A group of 26 Planning Authorities is in Phase Two of a multi-year effort to develop transmission expansion scenarios for the Eastern Interconnection. ATC has received funding from the Department of Energy and is actively participating in the collaborative.

In Phase One, the collaborative developed eight energy policy future scenarios and analyzed the generation additions and deactivations, as well as the transmission interchanges between regions associated with those scenarios. Three scenarios were selected for more detailed study in Phase Two. The possible transmission development options in Phase Two scenarios will be analyzed using North American Electric Reliability Corp. reliability criteria and traditional transmission planning tools. The scenarios also will undergo production-cost analysis. Both alternating current and direct current lines are being considered. More information on this effort can be found at www.eiponline.com.

MISO Transmission Expansion Planning

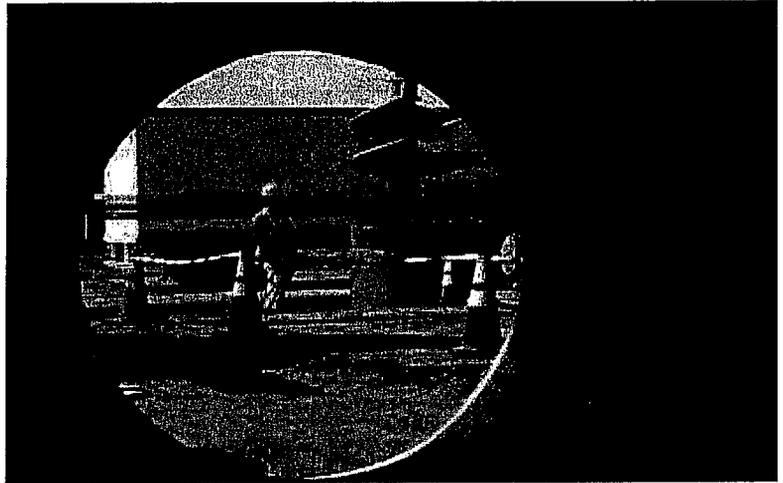
ATC participates in MISO planning studies that address long-term, short-term and targeted issues and needs. The long-term studies are primarily value-based economic studies looking into a 10- to 20-year horizon. These studies use different future scenarios agreed upon by the MISO stakeholders and measure the economic savings from proposed transmission projects. Short-term planning examines a five- to 10-year horizon and is primarily driven by transmission owners' reliability needs and compliance with NERC reliability standards.

MTEP12

Our strategic projects staff is participating in this current short-term planning review by contributing project information, helping build and review planning models, and correlating the needs identified in the MISO analyses with specific ATC projects.

Other MISO planning activities

We participate in MISO's Planning Subcommittee and Western Technical Studies Task Force, as well as in the Planning Advisory Committee to the MISO Board of Directors. We also participate in or observe other MISO planning activities that involve generation and interconnection studies.



Northern Area Study

MISO launched a Northern Area Study in June 2012 to address a number of transmission proposals and issues in Manitoba, North Dakota, South Dakota, Minnesota, Wisconsin and Michigan. The drivers for the study include:

- ▶ potential addition of generation and imports from Manitoba Hydro,
- ▶ potential generation retirements driven by EPA regulations,
- ▶ multiple transmission lines proposed by a number of transmission owners,
- ▶ potential load growth in Michigan's Upper Peninsula, northern Wisconsin and North Dakota, and
- ▶ a need to improve system reliability in the study area.

The analysis aims to identify the economic opportunity for transmission development, develop proposals to address regional needs, calculate the costs and benefits, and identify the most valuable proposal or proposals for further consideration.

Market constraints

Two of the three narrowly constrained areas within the MISO footprint are in our service area. While congestion has declined in these areas of Wisconsin and Upper Michigan – in part due to the completion of the Paddock-Rockdale 345-kV line and generation additions – congestion remains during more than 500 hours each year. We continue to work actively within the MISO planning process to identify and resolve the underlying constraints on our system and to provide better access to the wholesale energy market.

○ Major project updates

Badger Coulee

The Badger Coulee project was one of 17 Multi-Value Projects approved by the MISO board of directors in late 2011. The 150-mile, 345-kV line between the La Crosse and Dane County areas will deliver benefits to Wisconsin and the Midwest region in three important ways:

- ▶ Improving electric system reliability locally and regionally
 - Offsetting the need for about \$180 million (\$140 million in the ATC service area) in lower-voltage upgrades in western Wisconsin communities
- ▶ Delivering economic savings for Wisconsin utilities and consumers
 - Providing increased access to the wholesale energy market and improving grid efficiency
 - Could provide \$230 to \$962 million in net economic benefits over the life of the project
- ▶ Expanding infrastructure for greater use of renewable energy
 - Establishes another pathway for renewable energy into Wisconsin with connection to key load centers

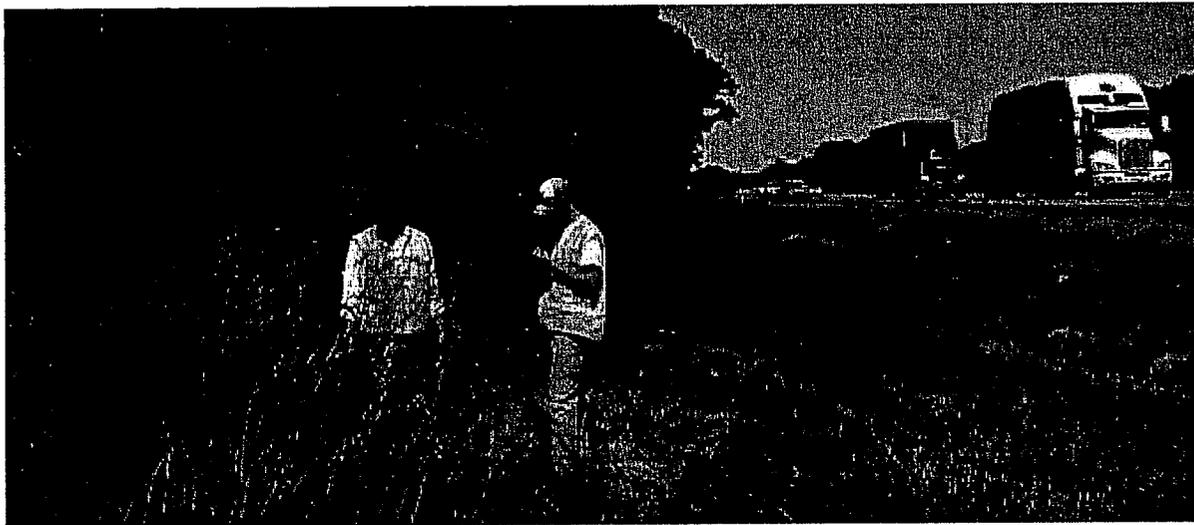
Public outreach on the project was initiated in 2010; preliminary route alternatives have been identified and an application is expected to be filed with the Public Service Commission of Wisconsin in 2013.

Pleasant Prairie–Zion Energy Center

Regulators in Wisconsin and Illinois approved the Pleasant Prairie-Zion Energy Center project earlier this year. This MVP will help relieve transmission system congestion in the region surrounding the southern tip of Lake Michigan. The project will provide savings to electric utilities and their customers by enabling the most efficient generators to supply power to the energy market, allowing utilities to buy and sell power when it is economic to do so. It also will increase electric system reliability, locally and regionally, by adding an additional high-voltage connection between Illinois and Wisconsin. Construction of the six-mile, 345-kV line will begin in late 2012 for an in-service date in 2013.

Cardinal Bluffs

Our third MVP proposal (formerly known as the Dubuque-Spring Green-Cardinal 345-kV project) will provide benefits that exceed its cost. Similar to Badger Coulee, Cardinal Bluffs will improve local and regional reliability, deliver economic benefits by providing greater access to the wholesale market, and enable Iowa to bring more renewable generation to market. This 125-mile line will run from the Cardinal Substation in the Town of Middleton, Wis., to northern Dubuque County. Public outreach for routing and siting will begin later in 2012. Regulatory applications are scheduled to be filed in 2014 to meet an in-service date of 2018.



Bay Lake

In April 2012, we announced a package of proposals to address the delicate, shifting balance between generation, load and transmission in the northern region of our system. The Bay Lake Project, as originally proposed, includes:

- ▶ a 345-kV line from a new substation in the Green Bay area to an expanded National Substation near Ishpeming, Mich.,
- ▶ a 138-kV line from the new Green Bay area substation to the Morgan Substation near Oconto Falls, Wis., and
- ▶ two 138-kV lines between the Holmes Substation in Menominee County, Mich., and the Escanaba, Mich., areas.

We requested MISO to review these projects outside the traditional MTEP process. At the time of publication, MISO has approved a portion of the proposed facilities to meet a late 2016 in-service date. For the most current information, please refer to our projects website:

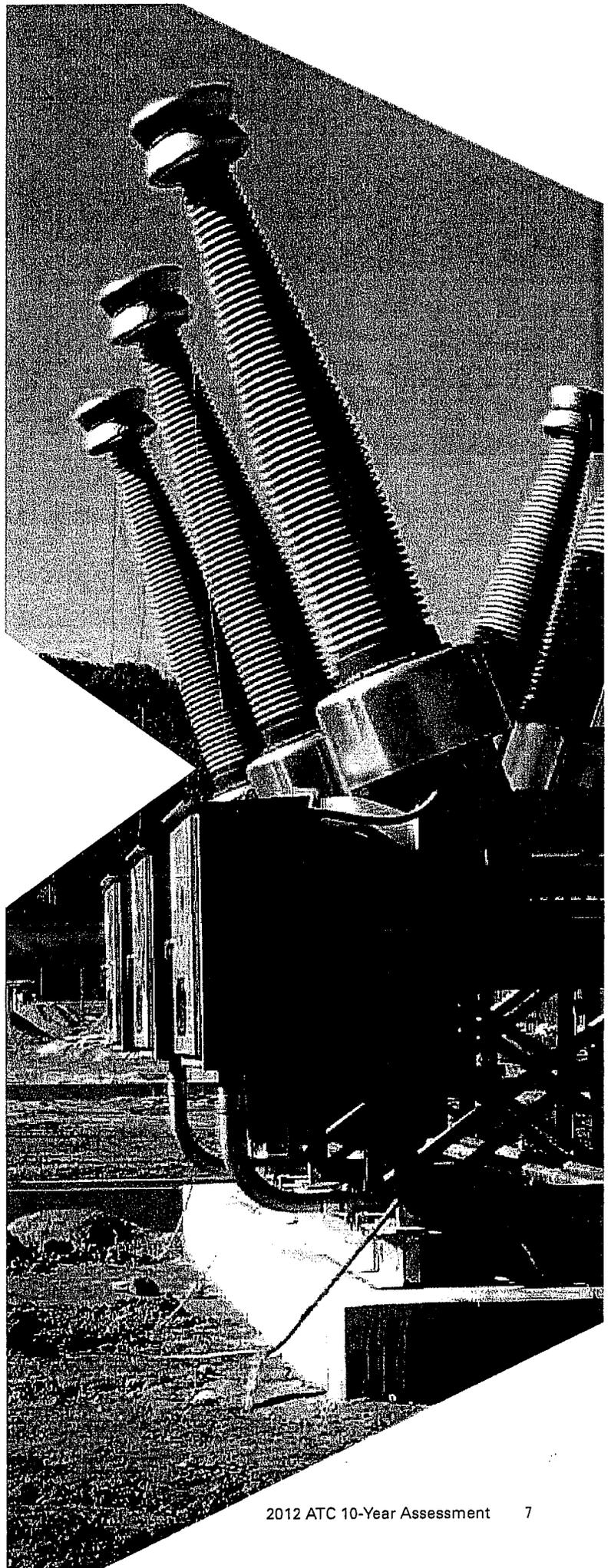
www.atc-projects.com.

Barnhart-Branch River

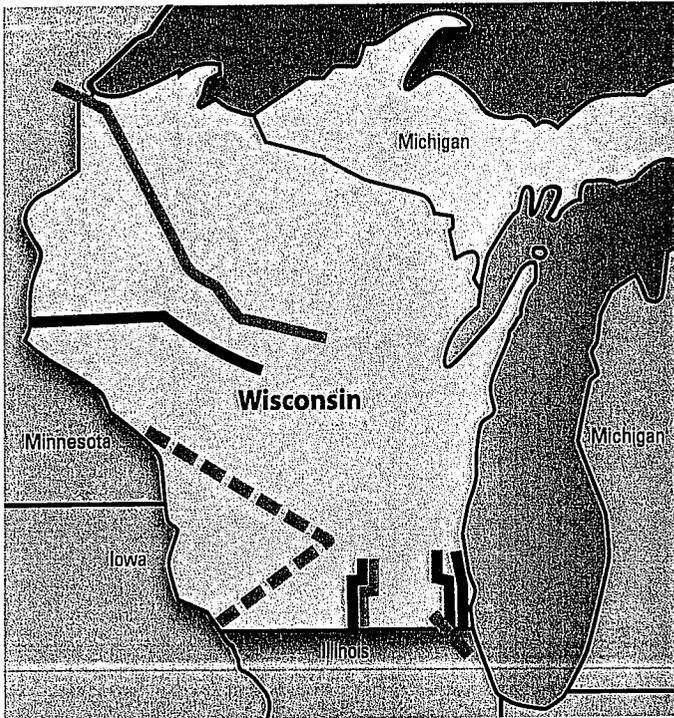
This 345-kV line and two new substations are needed to address equipment modifications and an associated increase in generating capacity at the Point Beach Nuclear Plant in Manitowoc County, Wis. The 51-mile line would significantly improve reliability of the high-voltage grid in eastern Wisconsin and connect the new Barnhart Substation in Sheboygan County with the new Branch River Switching Station in Manitowoc County. Two route alternatives were developed with public involvement, and an application will be filed with the PSC in late 2012. If approved, the facilities would be placed in service in 2018.

Straits HVDC Flow-Control

Construction began in early 2012 on a high-voltage, direct-current flow-control device near the Straits Substation in St. Ignace, Mich., to better manage power flows into and out of the Upper Peninsula. This project will enable MISO to control the flows into and out of the U.P., helping to accommodate the transmission of renewable wind energy being developed in the resource-rich region to our west. The \$130-million project is expected to go into service in 2014. Planning studies determined the flow-control device to be a less-expensive and faster solution compared to the portfolio of transmission lines studied as alternatives.



Our progress



ATC's interstate connections

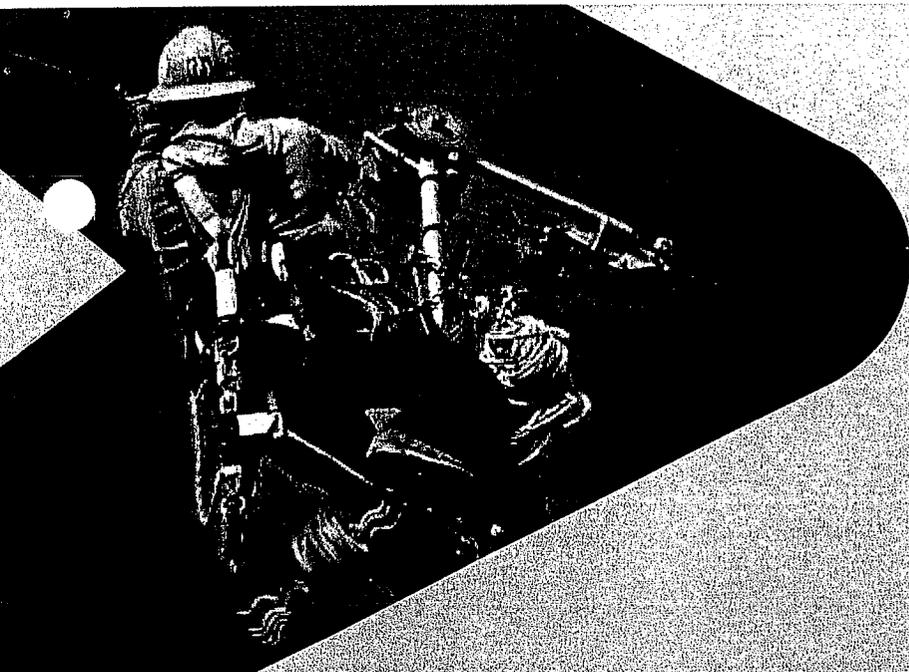
-  Interstate 345-kV transmission connections prior to 2001
-  Interstate 345-kV transmission connections added since 2001
-  Proposed MVP transmission connections

Our long-term access initiative, launched in 2005, has demonstrated that reliability projects have significant economic benefits as well. Locational marginal prices in our service territory are now aligned with those in neighboring hubs. When we began operations in 2001, our interconnections with other states were used to import power. With the increased connections to neighboring transmission facilities, our customers now have the opportunity to export power when it is economically desirable to do so.

We have invested \$2.7 billion in improvements that have enhanced system reliability in the last 11 years. Increasingly, we see those investments reflecting the trend toward more regional planning that improves broader-area reliability and strengthens the bulk electric markets. Even with this considerable investment, transmission cost remains the smallest component of a retail customer's electric bill – about 8 percent in our case. (Retail customers pay for the generation, transmission and distribution of electricity, plus fuel costs, through regulated utility rates. Generation and fuel make up the major portion of the bill, followed by distribution infrastructure.)

Effective management of existing assets complements our planning strategy for maintaining and improving reliability. Equipment life cycles and replacement plans are driven by safety, regulatory compliance, reliability performance and environmental stewardship.

Our asset management personnel have maintained top-tier reliability performance while managing a robust construction program. Our 115-kV, 138-kV and 345-kV lines operated in the top 10 percent for reliability performance in 2011, when benchmarked against 24 transmission entities. Our 69-kV lines were in the top 25 percent. While our facilities are performing well, targeted investment is needed to maintain reliability.



Major accomplishments to date

Since we were formed in 2001 as a utility solely focused on electric transmission, we have:

- ▶ upgraded more than 1,748 miles of transmission line
- ▶ improved 155 electric substations and
- ▶ built 45 new transmission lines (557 miles)

A more reliable transmission system has enabled us to

- ▶ meet a new peak load in 2011 with no customer interruption
- ▶ maintain top reliability performance
- ▶ support approximately 1,200 MW of new peak electric usage
- ▶ connect 6,048 MW of new generation at 24 sites
- ▶ increase the ability of our system to import power by 750 MW
- ▶ reduce energy losses over the 40-year lives of our completed projects at a level that equates to
 - 15-19 million megawatt hours of electricity saved (enough to power 36,000-45,500 homes each year)
 - 10-14 million tons of CO₂ emissions (associated with producing lost energy) eliminated
 - averting the need for a 124-154 megawatt generating plant to serve peak demand
- ▶ resolve problems in 18 specific areas to move power into or through our system
 - Arrowhead-Weston (Northwestern Wisconsin)
 - Blackhawk-Coley Road (Rock County)
 - Christiana-Kegonsa (Dane County)
 - Cranberry-Conover-Plains (Northern Wisconsin and Upper Peninsula of Michigan)
 - Eau Claire-Arpin (Wood County)

- Gardner Park-Central Wisconsin (Marathon and Shawano counties)
- Kewaunee (Kewaunee County)
- Manistique-Hawatha (Schoolcraft and Mackinac Mich. counties)
- Morgan-Werner West (Shawano, Waupaca, Outagamie and Oconto counties)
- North Madison-Huiskamp (Dane County)
- North Appleton-Lost Dauphin (Outagamie and Brown counties)
- North Appleton-White Clay (Outagamie and Shawano counties)
- Paddock-Rockdale (Dane and Rock counties)
- Paris-St. Martins (Kenosha, Racine and Milwaukee counties)
- Plains-Stiles (Oconto, Marinette, Menominee Wis. and Dickinson Mich. counties)
- Rhinelander area (Lincoln, Oneida and Langlade counties)
- Wempletown-Paddock (Rock County and northern Illinois)
- Whitewater-Mukwonago (Walworth and Waukesha counties)

We have made progress by actively seeking input and making our plans and proposals public. To date, ATC has:

- ▶ produced and issued 17 transmission system assessments to the public
- ▶ held dozens of major public planning and siting meetings and
- ▶ participated in thousands of interactive local, state and industry discussions, both giving and receiving information to carry out our duties and responsibilities.

What drives the need for transmission system expansion?

Economics – We evaluate the impact of transmission congestion on energy market prices and study projects to determine economic savings to offset most or all of the congestion and loss costs. An example is evaluating increased access to markets outside our footprint.

Solution: Two projects have been completed, two are planned, four are proposed, and another two provisional projects are being studied.

Renewables/Public Policy – All of the states in which we operate and most other Midwestern states have adopted renewable portfolio standards.

Solution: We are participating in several regional transmission studies to identify the transmission needed to integrate renewable generation, including wind, much of which could be located in areas remote from large load centers.

Load growth – Demand for electricity during peak usage periods is projected to grow at a rate of approximately 0.9 percent across our service territory from 2013 through 2022.

Solution: More than **110** projects are planned for assuring reliability, at least in part due to load growth.

Distribution interconnections – The transmission system is dynamic; changes in the marketplace, as well as changes in generation – new plants coming on line, older units being retired – drive the need for additional transmission-to-distribution interconnections.

Solution: **197** interconnections are planned in the next 10 years. More than **297** new or improved T-D interconnections have been made since 2001.

New generation – When a new generating facility is proposed, we conduct a system impact study and, if requested, a facilities study. If the existing transmission system is inadequate to ensure generator stability or reliable transmission service, we will determine what system expansion will be needed.

Solution: **11** generators are active in our generation queue, and many reflect the growing development of wind energy. **24** generators added since 2001 required construction of transmission facilities.

Asset renewal – Keeping transmission lines, substations and related equipment in good operating condition extends the life of the facilities, improves system performance and safety, and minimizes the potential for outages. Part of the \$3.9 to \$4.8 billion investment ATC will make over the next 10 years is dedicated to asset renewal. Major projects at substations include replacing circuit breakers, protective relays, lightning protection and transformers. Major work on transmission lines involves rebuilding or upgrading aging power lines, including the replacement of structures, conductors, insulators and other equipment.

Solution: More than **100** projects to address asset renewal needs are planned in the next 10 years.

Transmission service requests – Virtually all entities that own power plants or provide electric service to customers, or both, seek to buy and sell electricity with other entities. We evaluate those requests to determine whether the transmission system will operate reliably if the request is granted. If the request can't immediately be granted, we will identify transmission system reinforcements needed to grant the request.

Solution: More than **35** projects to meet transmission service requests have been completed since 2001.

Generator retirements – Similar to new generator requests, when a large generator is retired due to age or other reasons, we will determine how system requirements will be affected. Environmental regulations, market conditions and other factors are expected to impact retirements across the U.S. in the next 5 to 10 years.

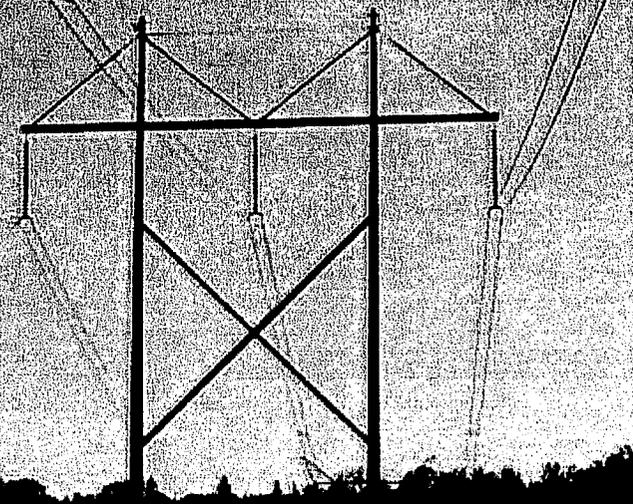
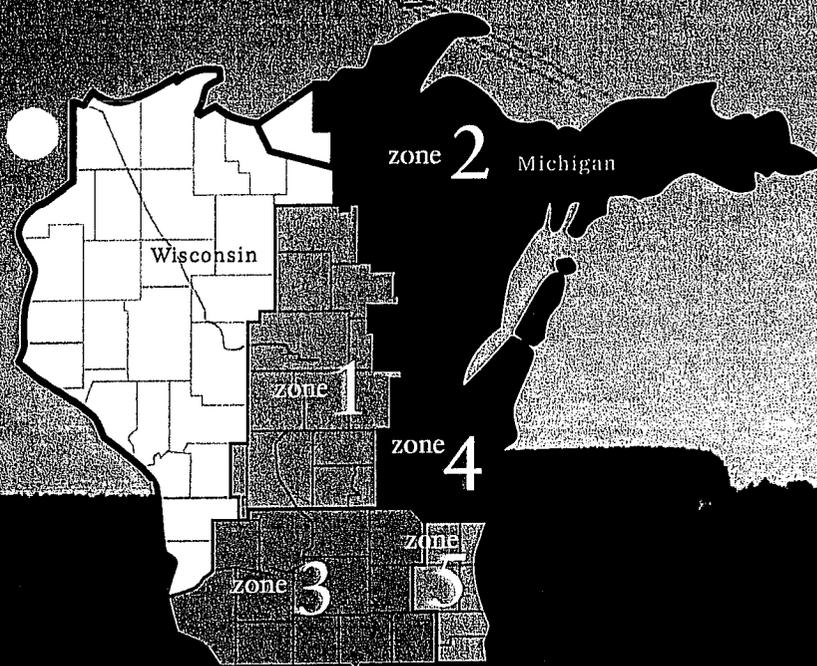
Solution: Generation uncertainties are growing due to a number of factors. We are working closely with generation owners and MISO to anticipate reliability impacts to our transmission system.

Regulatory environment – Physical and cyber security and reliability standards continue to increase, which affect planning criteria.

Solution: We are participating in the NERC standards process to help anticipate the future impacts of these changes on our planning processes and systems.

Integration of new technologies – Demand-side management, variable generation, distributed resources and smart grid technologies all require changes in how the grid is planned and operated to maintain reliability.

Solution: The type of flow-control device between Upper and Lower Michigan will be one of few utilized in the U.S.



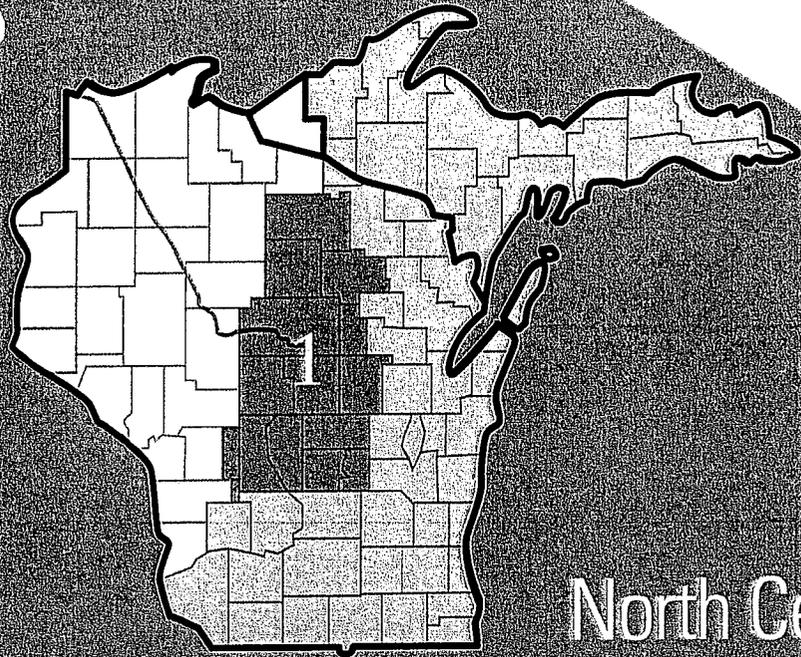
Plans and proposals for the transmission system

For planning purposes, we divide our service area into five zones representing distinct geographic or usage areas. Within each zone, we compile and assess the transmission system needs.

Project classification

Within each zone, we have recommended network and asset renewal projects to address system limitations. The network projects are classified into one of three possible categories – **Planned, Proposed or Provisional** – depending upon the stage a project may be in. These categories are consistent with those used by MISO.

| | Planned | Proposed | Provisional |
|--|--|---|--|
| Status of ATC planning activities | Studies complete | Studies not complete | Studies not complete |
| Application for regulatory approval | Application pending or issued | None | None |
| Project status | Project in construction planning phase or under construction | Project identified as preferred alternative | Placeholder project; not necessarily a preferred project alternative |
| System solution included in generation interconnection power flow models | Project included | Project not included | Project not included |



Zone 1

North Central Wisconsin

- | | | |
|--|-------------------------------------|---------------------------------------|
| ADAMS | LINCOLN | VERNON (eastern portion) |
| FOREST (southwestern portion) | MARATHON | VILAS (southern portion) |
| FOND DU LAC (northwestern portion) | MARQUETTE | WAUPACA |
| GREEN LAKE | MONROE (eastern portion) | WAUSHARA |
| JUNEAU | ONEIDA | WINNEBAGO (western portion) |
| LANGLADE | PORTAGE | WOOD |
| | SHAWANO (western portion) | |

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North Central Wisconsin – Zone 1

Transmission system characteristics in Zone 1

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

- ▶ East-west 345-kV line from Arpin Substation through Stevens Point extending to the Appleton area,
- ▶ 345-kV line extending from Wausau to northeastern Minnesota,
- ▶ 345-kV line extending from Wausau to Stevens Point to eastern Outagamie County (Highway 22),
- ▶ 115-kV network in the northern portion of the zone, and
- ▶ 138-kV and 69-kV network in the southern portion of the zone.

There are a number of transmission system performance issues in Zone 1, including overloaded lines and equipment, and low system voltages.

Transmission system limitations in Zone 1

Key system performance issues from this Assessment in Zone 1 include low voltages and thermal overloads in the southern portion of the zone. These issues will necessitate a combination of reinforcements. In addition, for the northern portion of the zone, other studies occurring in parallel with this Assessment, including Northern Area Studies performed by ATC and MISO, have identified several voltage and thermal limitations. The most severe limitations occur during off-peak periods.

Electric System Overview

Slight increases expected in population, employment

Population in Zone 1 is projected to grow at 0.7 percent annually between now and 2021. Employment is projected to grow at 1.1 percent annually between now and 2021. Marathon County will realize the largest increase in population and employment, while Adams County will have the highest growth rate.

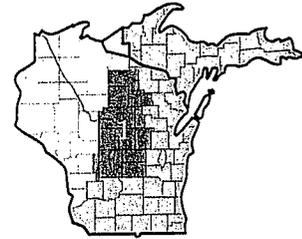
Electricity usage growing

Peak electric demand typically occurs 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.

Electric load is projected to grow approximately 0.53 percent annually through 2021.

Transmission projects in Zone 1

North Central Wisconsin – Zone 1



We have implemented one network project in Zone 1 since the 2011 Assessment, which was the construction of a new 115-kV line to the new Woodmin Substation from the Clear Lake Substation.

Our current plans in Zone 1 include 22 system reliability and economic projects between 2012 and 2026, eight of which are related to our new Study-Based Ratings Methodology, described on page 3. These projects are in various stages of development. The most notable planned, proposed, provisional and asset renewal 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 | Monroe County Council Creek 161-kV line construction | 2014 | Low voltages; economics; avoid reconfiguration during emergencies |
| | Provisional projects | | |
| 2 | Fairwater-Mackford-Prairie 69-kV line construction | 2018 | Overloads and low voltages |
| | Asset Renewal projects | | |
| 3 | Montello-Wautoma 69-kV line rebuild | 2017 | Condition and performance |
| 4 | Plover-Whiting 115-kV line rebuild | 2019 | Condition and performance |
| 5 | Coyne-Saratoga 115-kV line partial rebuild | 2020 | 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

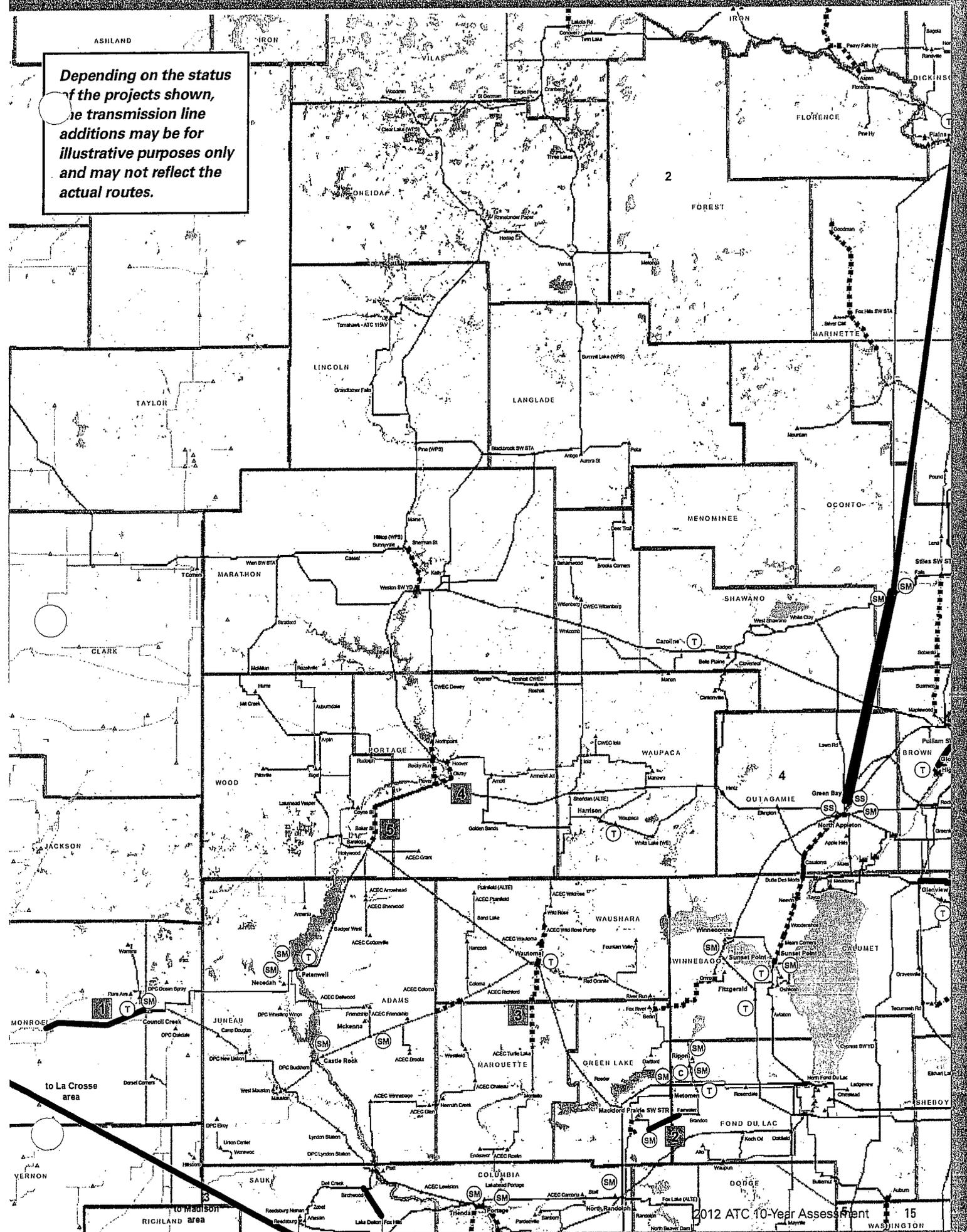
TRANSMISSION LINE KEY

- 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
- 161 kV
- 115 kV
- 230 kV
- 138 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.





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)

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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.

Transmission system limitations in Zone 2

In the analysis of Zone 2, we identified low voltages, high voltages, transmission facility overloads and transmission service limitations. In addition, other studies occurring in parallel with this Assessment, including Northern Area Studies performed by ATC and MISO, have identified several voltage and thermal limitations. The most severe limitations occur during off-peak periods.

Electric System Overview

Small increases expected in population, employment

Population in Zone 2 is projected to grow about 0.2 percent annually between now and 2021, and employment is expected to grow about 1.0 percent each year in the same time period. Marquette County, Mich., is projected to realize the largest increase in employment, while Houghton 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 0.35 percent annually through 2021. Also, locally generated electricity is declining in the area with smaller, coal-fired generators most at risk. This includes generation owned by industry, municipalities and utilities.

Transmission projects in Zone 2 Michigan's Upper Peninsula and Northern Wisconsin – Zone 2



Transmission projects in Zone 2

We have implemented three network projects in Zone 2 since the 2011 Assessment, including installing a second 138/69-kV transformer and a 138-kV ring bus at the Chandler Substation.

Our current plans in Zone 2 include 20 system reliability and economic projects between 2012 and 2026, three of which are related to our new Study-Based Rating Methodology. 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.

System Solutions Key

SUBSTATION KEY

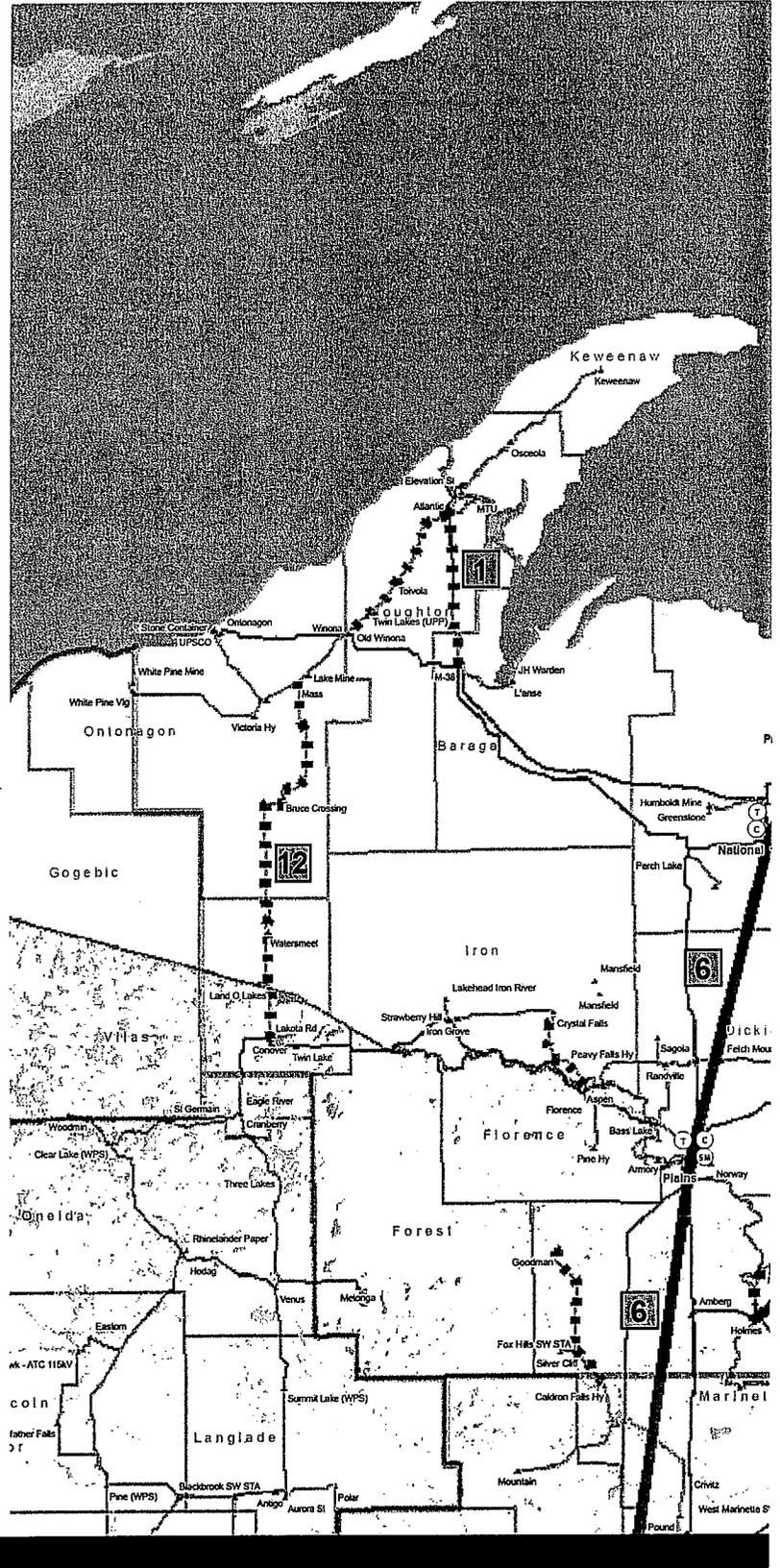
- SS **New substation**
Supports transmission system expansion
- SM **Substation modifications**
Upgrades equipment ratings to avert facility overloads
- T **Transformer**
Supports local growth and improves voltage levels
- C **Capacitor bank or reactor**
Relieves low voltages or high voltages
- T-D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

TRANSMISSION LINE KEY

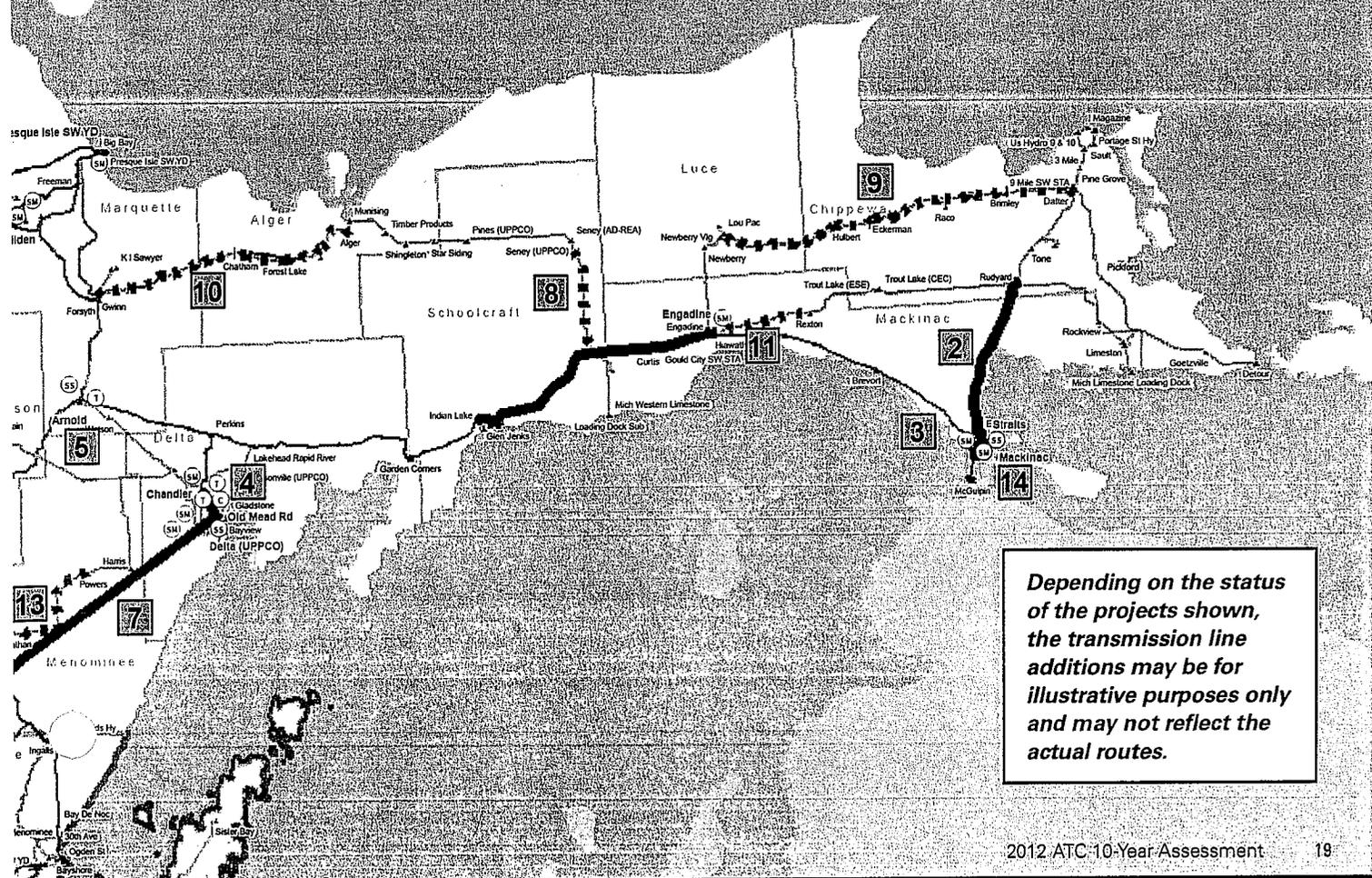
- 345-kV transmission line
- 115-, 138- or 161-kV transmission line
- Rebuilt 115- or 138-kV transmission line
- Transmission line voltage conversion
- 69-kV transmission line
- Rebuilt 69-kV transmission line

EXISTING TRANSMISSION LINES KEY

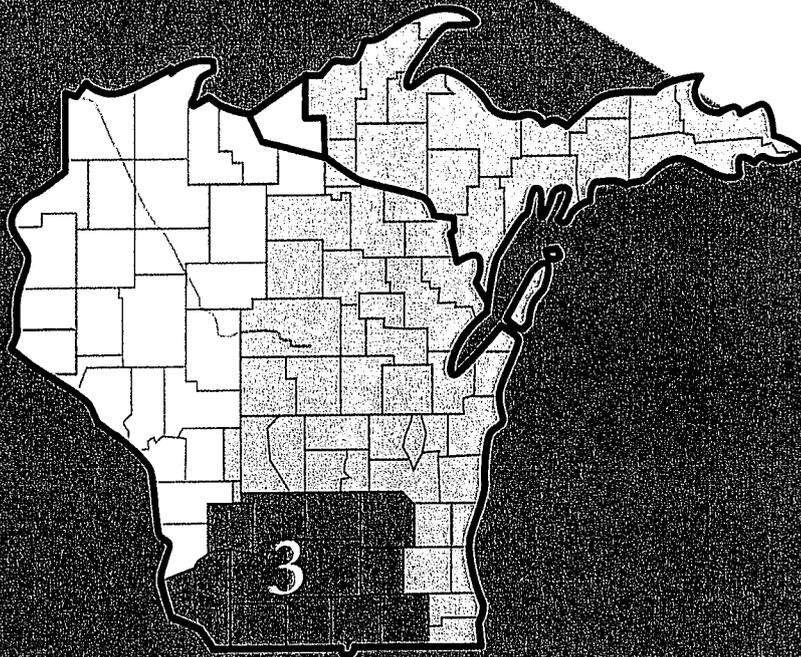
| | |
|--------|--------|
| 69 kV | 161 kV |
| 115 kV | 230 kV |
| 138 kV | 345 kV |



| | Project description | In-service year | Need driver |
|-------------------------------|---|-----------------|--|
| Proposed projects | | | |
| 1 | Atlantic-M38 69-kV line rebuild | 2013 | Overloads, low voltages, condition and performance |
| 2 | Straits-Pine River 69-kV double circuit rebuild | 2014 | Overloads and low voltages |
| 3 | Mackinac 138-kV Substation; Installation of back-to-back HVDC flow control device | 2014 | Address/control flow across eastern U.P., overloads and low voltages |
| Proposed projects | | | |
| 4 | Chandler-Old Mead Road 138-kV double circuit lines | 2014 | Overloads and low voltages |
| 5 | Arnold 345-kV Substation construction and 345/138-kV transformer | 2014 | Overloads and low voltages |
| 6 | Bay Lake-Green Bay-Morgan-Plains-National 345-kV line construction | 2016-2018 | Overloads and low voltages |
| 7 | Bay Lake-Holmes-Escanaba 138-kV project | 2016-2018 | Overloads and low voltages |
| Provisional projects | | | |
| 8 | Seney-Blaney Park 69-kV line uprate | 2015 | Overloads, low voltages, condition and performance |
| Asset Renewal projects | | | |
| 9 | Nine Mile-Roberts 69-kV line partial rebuild | 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 |



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.



Zone 3

South Central/Southwest Wisconsin and North Central Illinois

COLUMBIA

DODGE

LAFAYETTE

SAUK

CRAWFORD
(southern portion)

GRANT

JEFFERSON

WALWORTH

DANE

GREEN

RICHLAND

WINNEBAGO,
ILL.
(northern portion)

IOWA

ROCK

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

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,
- ▶ 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.

Transmission system performance issues in Zone 3 include 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, new power plants and different generation dispatch scenarios.

Transmission system limitations in Zone 3

In our analysis of Zone 3, we identified low voltages, high voltages and transmission-facility overloads. Low voltages are located in the Verona, Beloit, Hustisford and Waunakee areas. Several overloads on 138-kV and 69-kV facilities in Zone 3 are emerging concerns.

Electric System Overview

Increases expected in population, employment

Population in Zone 3 is projected to grow about 0.9 percent annually between now and 2021, and employment is projected to grow about 1.3 percent each year for the same time period. Dane County is projected to realize the largest increase in population, and Sauk County is projected to have the largest increase in employment.

Electricity usage growing

Electric load is expected to grow approximately 1.38 percent annually through 2021 for all of Zone 3.



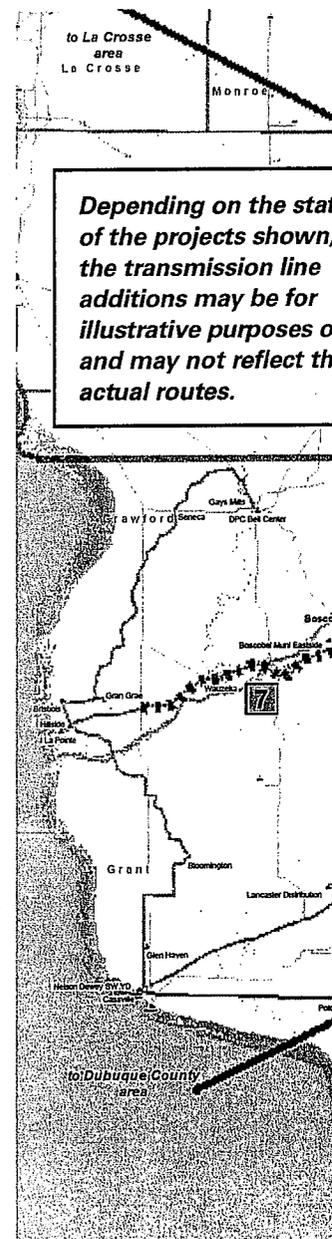
Transmission projects in Zone 3

South Central/Southwest Wisconsin and North

We have implemented two network projects in Zone 3 since the 2011 Assessment, most notably the Brodhead to South Monroe 69-kV line rebuild project.

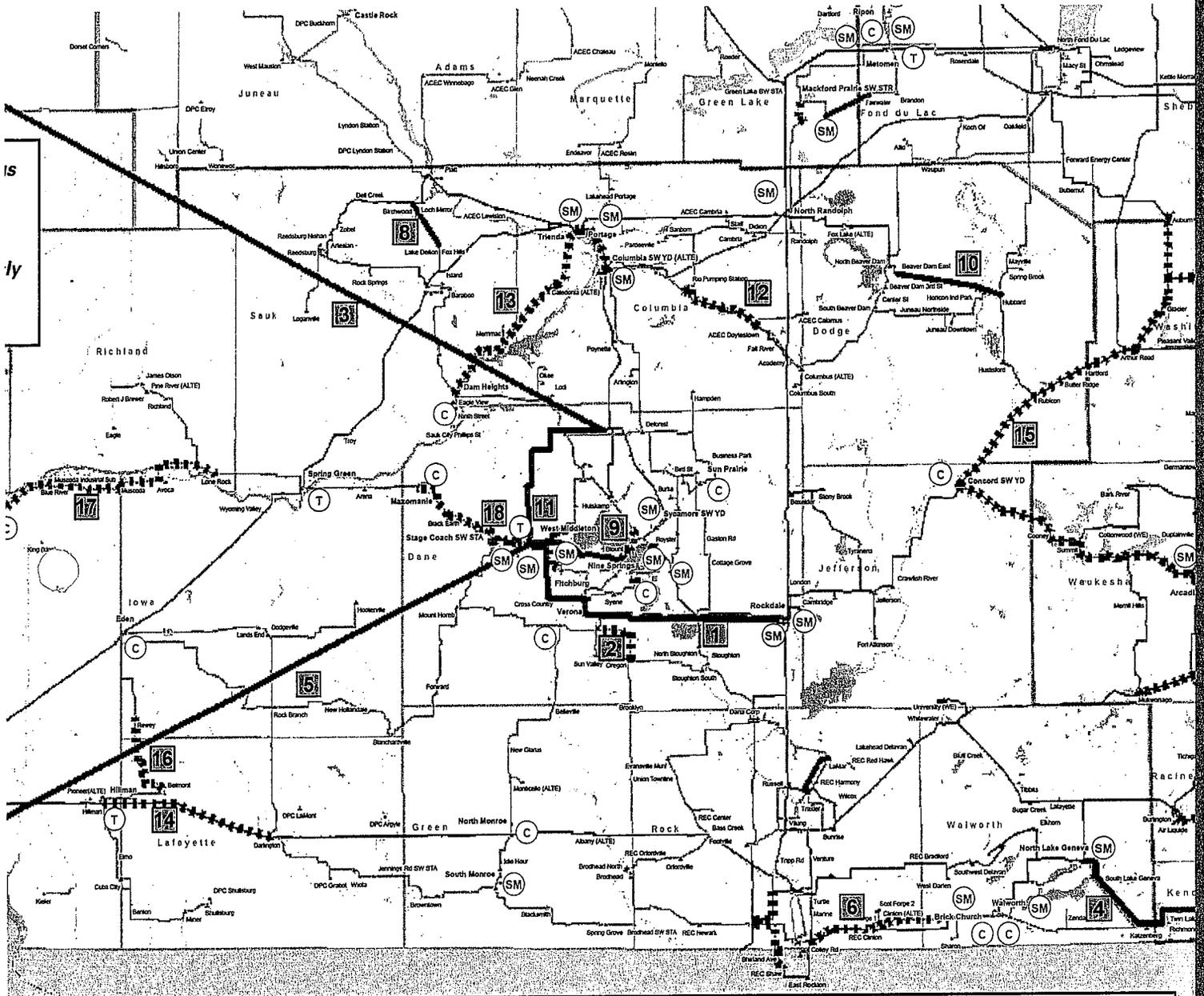
Our current plans in Zone 3 include 49 system reliability and economic projects between 2012 and 2026, 15 of which are driven by our new Study-Based Rating Methodology. These projects are in various stages of development. The most notable planned, proposed, provisional and asset renewal projects in Zone 3, along with their projected year of completion and the factors driving the need for the projects, are listed below.

| | Project description | Projected Year | Need/Driver |
|-------------------------------|---|----------------|--|
| Planned projects | | | |
| 1 | Rockdale-Cardinal 345-kV line | 2013 | Overloads and low voltages; improve transfer capability to Madison area; avert voltage collapse; lower system losses |
| Proposed projects | | | |
| 2 | Sun Valley Tap-Oregon 69-kV line rebuild | 2016 | Overloads and improve line condition and area voltages |
| 3 | Badger-Coulee-La Crosse area-North Madison-Cardinal | 2018 | Reliability, economics and public policy |
| 4 | Spring Valley-North Lake Geneva 138-kV line construction | 2019 | Overloads and low voltages; provide network service |
| 5 | Cardinal Bluffs-Dubuque County area-Cardinal 345-kV line construction | 2019 | Reliability, economics and public policy |
| Provisional projects | | | |
| 6 | Colley Road-Briok Church 69-kV line rebuild | 2018 | Overloads and low voltages |
| 7 | Gran Grace-Boscobel 69-kV line rebuild | 2019 | Overloads |
| 8 | Lake Delton-Bronwood 138-kV line construction | 2020 | Overloads and low voltages |
| 9 | Cardinal Blount 138-kV line construction | 2020 | Overloads and low voltages |
| 10 | Hubbard-East Beaver Dam 138-kV line construction | 2022 | Overloads and low voltages |
| 11 | West Middleton-Pheasant Branch 69-kV line rebuild | 2022 | Overloads and low voltages |
| Asset renewal projects | | | |
| 12 | Doylestown-Rio Pumping Station 69-kV line rebuild | 2013 | Condition and performance |
| 13 | Dam Heights-Portage 69-kV line rebuild | 2016 | Condition and performance |
| 14 | Darlington-Hillman 138-kV line rebuild | 2016 | Condition and performance |
| 15 | Concord-Rubicon-Butler Ridge-Hartford 138-kV line rebuild | 2016 | Condition and performance |
| 16 | Belmont-Rewey 69-kV line rebuild | 2018 | Condition and performance |
| 17 | Boscobel-Lone Rock 69-kV line rebuild | 2018 | Condition and performance |
| 18 | West Middleton-Stagecoach 69-kV underground cable replacement | 2019 | Condition and performance |



- SUBSTATION**
- 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

Central Illinois – Zone 3



System Solutions Key

KEY

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



Zone 4

Northeast Wisconsin

Northeast Wisconsin – Zone 4

Transmission system characteristics in Zone 4

ATC delivers power in Zone 4 with various transmission facilities including:

- ▶ Four 345-kV lines extending from the Kewaunee and Point Beach nuclear units,
- ▶ Two 345-kV lines extending from the Edgewater Power Plant,
- ▶ Four 345-kV lines connecting the Gardner Park, Werner West, Morgan and Plains Substations,
- ▶ Two 345-kV lines from North Appleton to Werner West and Fitzgerald,
- ▶ Three 345-kV lines connecting South Fond du Lac Substation to the Columbia, Edgewater and Fitzgerald Substations, and
- ▶ A 138-kV network in the Fox River Valley/Green Bay area.

Transmission system limitations in Zone 4

For the analysis of Zone 4, other studies occurring in parallel with this Assessment, including Northern Areas Studies performed by ATC and MISO, have identified several voltage and thermal limitations. The most severe limitations occur during the off-peak periods.

Electric System Overview

Increases expected in population, employment

Population in Zone 4 is projected to grow 0.8 percent annually between now and 2021. Brown County is expected to realize the largest increase in population. Employment is projected to grow 1.1 percent annually in the same time period, with the largest increase projected in Brown County.

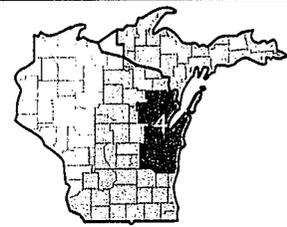
Electricity usage growing

Peak electric demand typically occurs during the summer months, although the northern portion of Zone 4 typically experiences nearly equal summer and winter peaks. Paper mills and foundries in the Green Bay and Appleton metropolitan areas are some of the largest electricity users in the zone.

Electric load is projected to grow at approximately 0.59 percent annually through 2021. Also, locally generated electricity is declining in the area with smaller, coal-fired generators most at risk. This includes generation owned by industries, municipalities and utilities.

Transmission projects in Zone 4

Northeast Wisconsin – Zone 4



We have completed two network projects in Zone 4 since the 2011 Assessment, most notably the construction of a new 138-kV line from Canal Substation to Dunn Road Substation and the installation of a 138/69-kV transformer at Dunn Road Substation.

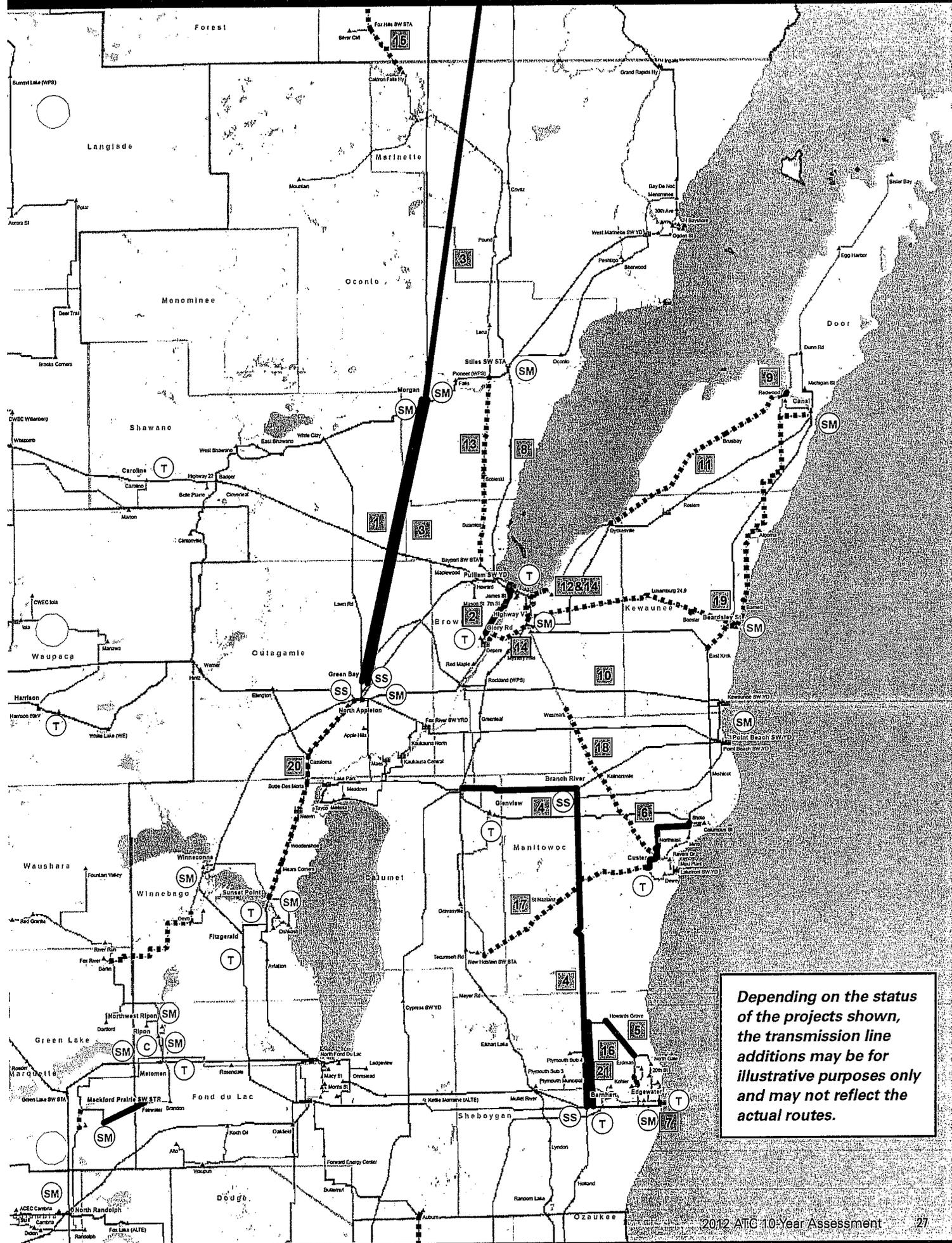
Our current plans in Zone 4 include 16 system reliability projects between 2012 and 2026, three of which are related to our new Study-Based Rating Methodology. These projects are in various stages of development. The most notable planned, proposed, provisional and asset renewal projects in Zone 4, along with their projected year of completion and the factors driving the need for the projects, are listed in the table below.

| | Project description | In-service year | Need driver |
|-------------------------------|--|-----------------|----------------------------|
| Proposed projects | | | |
| 1 | Bay Lake-Green Bay area-Morgan 138-kV line construction | 2016 | Overloads and low voltages |
| 2 | Pulliam-Glory Road 138-kV line conversion | 2016 | Overloads and low voltages |
| 3 | Bay Lake-Green Bay area-Morgan-Plains-National 345-kV line construction | 2016-2018 | Overloads and low voltages |
| 4 | Barnhart-Branch River project | 2018 | Accommodate new generation |
| 5 | Barnhart-Plymouth-Howards Grove-Erdman 138-kV line | 2018 | Accommodate new generation |
| Provisional projects | | | |
| 6 | Shore-Custer 138-kV line | 2022 | Overloads |
| Asset Renewal projects | | | |
| 7 | Replace Edgewater 138/69-kV transformers | 2013 | Condition and performance |
| 8 | Pulliam-Stiles 138-kV line shield wire replacement | 2013 | Condition and performance |
| 9 | First Avenue-Redwood 69-kV submarine cable replacement | 2015 | Condition and performance |
| 10 | North Appleton-Kewaunee 345-kV line cross-arm replacement | 2015 | Condition and performance |
| 11 | Dyckesville-Sawyer 69-kV line rebuild | 2016 | Condition and performance |
| 12 | University-Danz Avenue 69-kV underground cable replacement | 2017 | Condition and performance |
| 13 | Bayport-Sobieski-Pioneer 69-kV line rebuild | 2018 | Condition and performance |
| 14 | Oak Street-Highway V-Finger Road-Danz Ave 69-kV line rebuild | 2018 | Condition and performance |
| 15 | Caldron Falls-Goodman 69-kV line rebuild | 2019 | Condition and performance |
| 16 | Erdman-Lodestar 138-kV underground cable replacement | 2019 | Condition and performance |
| 17 | Custer-New Holstein 69-kV line rebuild | 2019 | Condition and performance |
| 18 | Wesmark-Manrap 69-kV line rebuild | 2020 | Condition and performance |
| 19 | Finger Road-Canal 69-kV line rebuild | 2020 | Condition and performance |
| 20 | North Appleton-Butte des Moirts-Neevin-Woodenshoe-Mears Corners-Sunset Point 138-kV line rebuild | 2020 | Condition and performance |
| 21 | Edgewater-Erdman 69-kV underground cable replacement | 2021 | Condition and performance |

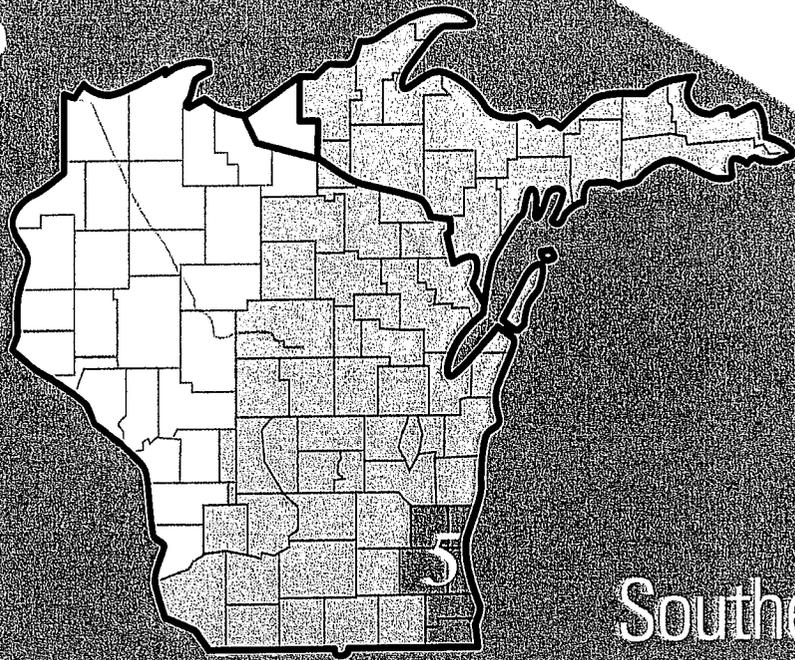
*This project is contingent on the route selected for the Barnhart-Branch River project

System Solutions Key

| | | |
|--|--|---|
| <p>SUBSTATION KEY</p> <ul style="list-style-type: none"> 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 | <p>TRANSMISSION LINE KEY</p> <ul style="list-style-type: none"> 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 | <p>EXISTING TRANSMISSION LINES KEY</p> <ul style="list-style-type: none"> 69 kV 161 kV 115 kV 230 kV 138 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.



Zone 5

Southeast Wisconsin

KENOSHA

OZAUKEE

WASHINGTON

MILWAUKEE

RACINE

WAUKESHA

www.atc10yearplan.com

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 road relocation project results in new projects to reconfigure the transmission system around Brookdale, Bluemound and 96th Street substations, as well as the construction of an 8-position ring bus at 96th Street.

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.

Electric System Overview

Small increases expected in population, employment

Population in Zone 5 is projected to grow 0.4 percent annually between now and 2021, and employment is projected to grow 1.1 percent in the same time period.

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

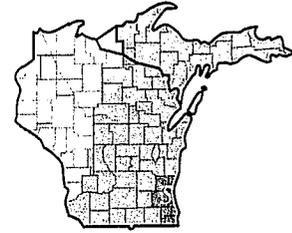
Electricity usage growing

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 1.01 percent annually through 2021.

Transmission projects in Zone 5

Southeast Wisconsin – Zone 5



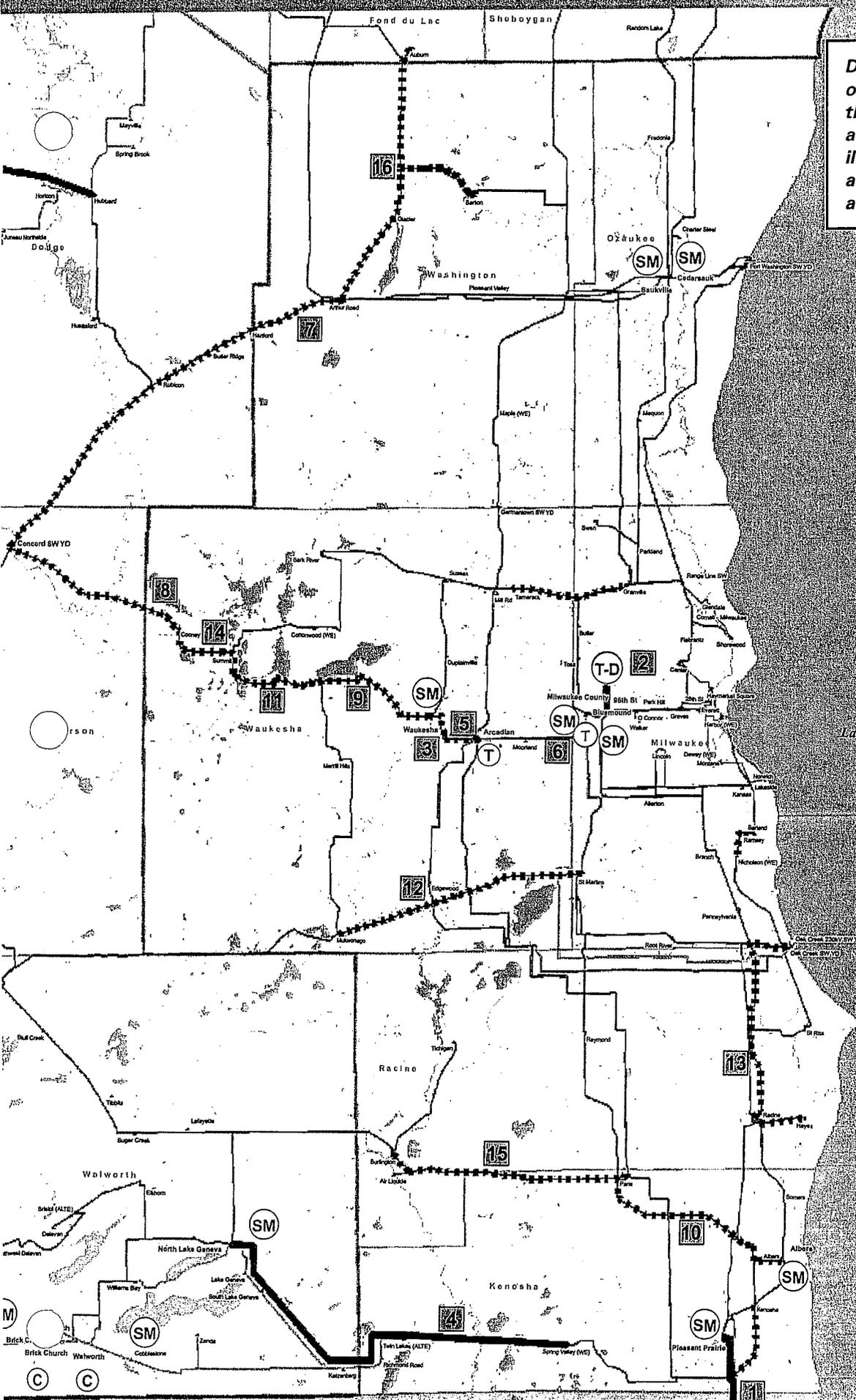
Our current plans in Zone 5 include 23 system reliability and economic projects between 2012 and 2026, 14 of which are related to our new Study-Based Rating Methodology. These projects are in various stages of development. The most notable planned, proposed, provisional and asset renewal projects in 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 construction | 2013 | Economics |
| 2 | Milwaukee County T-D 138-kV lines | 2015 | T-D interconnection |
| 3 | Arcadian-Waukesha 138-kV line rebuilds | 2016 | Overloads |
| 4 | Spring Valley-North Lake Geneva 138-kV line construction | 2019 | Overloads and low voltages provide network service |
| Provisional projects | | | |
| 5 | Replace Arcadian 345/138-kV transformers with single transformer | 2020 | Overloads |
| Asset Renewal projects | | | |
| 6 | Bluemound 230/138-kV transformer replacement | 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 | 2016 | Condition and performance |
| 10 | Paris-Albers 138-kV line rebuild | 2017 | Condition and performance |
| 11 | Merrill Hills-Summit 138-kV line partial rebuild | 2017 | Condition and performance |
| 12 | Mukwonago-Edgewood-St. Martins 138-kV line rebuild | 2017 | Condition and performance |
| 13 | Oak Creek-Hayes 138-kV line rebuild | 2019 | Condition and performance |
| 14 | Summit-Cooney 138-kV line rebuild | 2021 | Condition and performance |
| 15 | Paris-Burlington 138-kV line rebuild | 2021 | Condition and performance |
| 16 | St. Lawrence-Barton-Auburn 138-kV line rebuild | 2022 | Condition and performance |

System Solutions Key

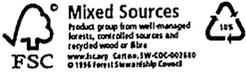
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| <p>SUBSTATION KEY</p> <p>SS New substation Supports transmission system expansion</p> <p>SM Substation modifications Upgrades equipment ratings to avert facility overloads</p> <p>T Transformer Supports local growth and improves voltage levels</p> <p>C Capacitor bank or reactor Relieves low voltages or high voltages</p> <p>T-D T-D interconnection Supports local growth</p> | <p>TRANSMISSION LINE KEY</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> Transmission line voltage conversion</p> <p> 69-kV transmission line</p> <p> Rebuilt 69-kV transmission line</p> | <p>EXISTING TRANSMISSION LINES KEY</p> <p> 69 kV 161 kV</p> <p> 115 kV 230 kV</p> <p> 138 kV 345 kV</p> |
|---|---|--|

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.





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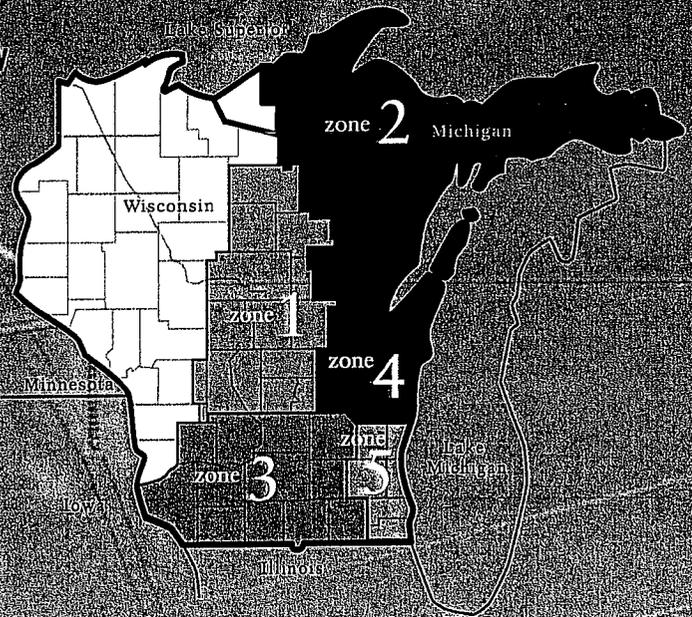
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