2012 10-Year Assessment
www.atc10yearplan.com

Regional planning

ATC is involved in various regional planning efforts that address regional, inter-regional and Eastern Interconnection-wide needs that could impact our transmission system. There continues to be proposed legislation at the national level that call for significant changes such as enhanced renewable portfolio standards and green-house gas emission reductions. While Wisconsin's Clean Energy Jobs Act was not passed into law in 2010, ATC continues to undertake internal analyses and participate in regional studies to anticipate future demands on the transmission system from enhanced renewable standards and to identify facilities that will potentially be required.

Eastern Interconnection Planning Collaborative (EIPC)

ATC is among the NERC-registered Planning Authorities in the Eastern Interconnection that form "Eastern Interconnection Planning Collaborative". The EIPC group consists of 26 Planning Authorities. The DOE has granted an award for $16 million to the group to develop transmission expansion options for the Eastern Interconnection under different scenarios. The project is divided into two phases. Phase 1 was completed at the end of 2011. In Phase 1, a Stakeholder Steering Committee with representatives from state regulatory bodies, transmission owners, generation owners (including renewables), end users, demand-side businesses, other suppliers, transmission-dependent utilities, public power entities and non-governmental entities was established. They developed eight macroeconomic future scenarios and 72 sensitivities. The modeling in Phase 1 of the study involves macroeconomic impacts of the stakeholder defined futures, the generation resource additions and retirements created by the futures and an initial indication of how much transmission might need to increase to accommodate the new and retired generation. This information was used to choose three scenarios for which detailed transmission expansion options are being developed in Phase 2. The three futures chosen include Business As Usual, incorporating the latest EPA proposed rules, a 30% national Renewable Portfolio Standard implemented regionally, and a Combined Policy future including reducing economy-wide carbon emissions by 42% by 2030, meeting 30% of the nation's electricity requirements from renewable resources by 2030 and significant deployment of energy efficiency measures, demand response, distributed generation, smart grid and other low-carbon technologies. At the conclusion of Phase 1, the DOE elected to move the project to Phase 2

Phase 2 of the project involves developing more detailed transmission expansion options for the three scenarios described above. The transmission option development includes more traditional power flow modeling to ensure the proposed options will meet NERC reliability criteria. This includes a variety of reliability tests. It will also involve production cost analysis of each of the options developed for the scenarios. Both Alternating Current (AC) and High Voltage Direct Current (HVDC) lines are being considered. ATC is an active participant in the EIPC and is one of eight sub-awardees of the DOE funding grant. The project will conclude at the end of 2012. More detailed information on the project can be

found at http://www.eipconline.com.

Regional Transmission Assessments
ATC is a member of two regional reliability organizations, the Midwest Reliability Organization (MRO) and the Reliability*First* Corporation (RFC). ATC participates in regional transmission assessments conducted by the MRO Transmission Assessment Subcommittee (TAS), and the RFC Transmission Performance Subcommittee (TPS). ATC also participates in the Coordinated Seasonal Assessments (CSA) conducted by MISO.

MISO Market Constraints –
There are three Narrow Constrained Areas (NCAs) identified in the MISO footprint and two of them are associated with ATC. An NCA is defined as "An electrical area that has been identified by the Independent Market Monitor (IMM) that is defined by one or more Binding Transmission Constraints that are expected to be binding for at least five hundred (500) hours during a given year within which one or more suppliers are pivotal."[1]. The two NCAs associated with ATC are Wisconsin and Upper Michigan System (WUMS) and Northern WUMS.
Congestion in WUMS declined in 2010 compared to prior years, in part due to the addition and enhancement of key transmission facilities, such as the Paddock-Rockdale line placed in service in 2010, as well as new generation additions. The congestion is now often from north to south from WUMS to Com Ed. However, congestion remained above 500 hours. Although there have been a number of transmission projects in WUMS, MISO's Independent Market Monitor (IMM) still expects that the constraints that define the WUMS NCA to surpass the 500-hour criteria during the next 12 months

Generation Deliverability – MISO uses an aggregate "deliverability" test, which, rather than studying a specific generator-to-load path, requires showing that the output of a resource is deliverable to the "aggregate" MISO energy pool without overloading the transmission system. If the resource passes the deliverability test, it is able to be designated as a Network Resource by a load serving entity with MISO. This deliverability analysis is performed as part of the generator-transmission interconnection process.

MISO Planning Process
The MTEP process has adopted an approach that investigates transmission expansions for the long term, short term and for targeted issues/needs. The MISO footprint is divided into three sub-regions for planning purposes: western, central and eastern. The ATC footprint falls within the western sub-region. The long-term studies are primarily value-based economic studies looking into the ten- to twenty-year horizon. Conceptual transmission overlays are proposed based on a value/economic view of future years utilizing an array of assumptions. This approach is often considered a "top-down" approach. The short-term

[1] Excerpt from MISO Transmission Expansion Plan 2008, Section 8.

planning looks into the five- to ten-year horizon and is thus primarily driven by Transmission Owners' reliability needs and compliance with NERC reliability standards. To date, the projects that address short-term reliability needs have been proposed to the MISO by individual Transmission Owners. Need drivers and alternatives are then verified through the MTEP process and studies. This approach is often considered a "bottom-up" approach. The targeted studies investigate specific issues and the time frame can be between long- and short-term. The short-term and targeted studies typically follow a one-year planning cycle. The long-term economic studies thus far follow a two-year planning cycle.

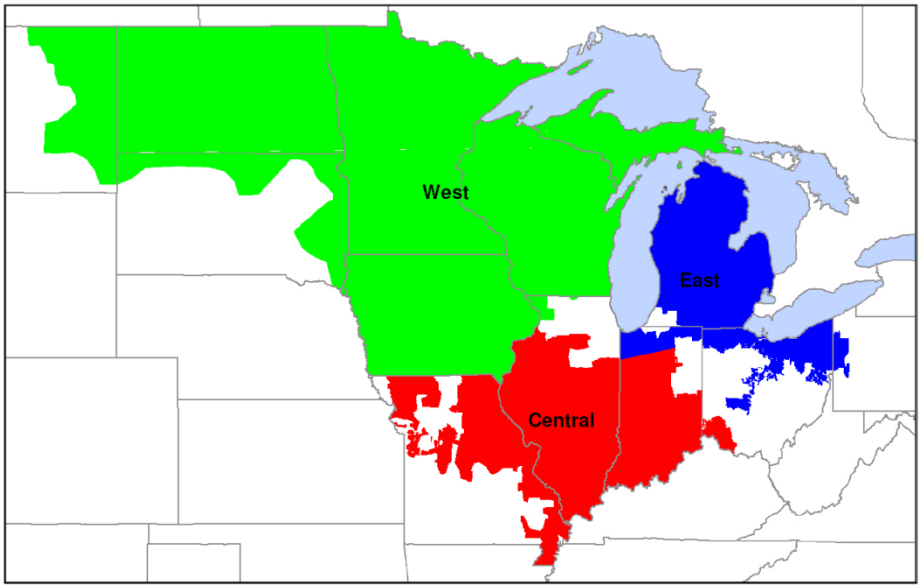

Figure RP-2: Map from MTEP10 Final Report

MISO Transmission Expansion Plan 2012 (MTEP12) reliability studies

The ATC Strategic Projects staff participates in the MISO MTEP12 bottom-up reliability studies to ensure correct representation of our projects. These activities include:

- ❑ Ensuring ATC's project information is in the MISO project database,
- ❑ Participating in building/reviewing the annual MTEP models,
- ❑ Correlating the needs identified in the MISO analyses with the specific ATC projects,
- ❑ Reviewing and commenting on MTEP study results to ensure successful inclusion of the ATC projects in MTEP Appendix A in a timely manner,
- ❑ Actively participating in the Northern Area Study, the Cross Border Top Congested Flowgate study and other targeted studies
- ❑ Ensuring the appropriate cost allocation is identified for those ATC projects eligible for regional cost sharing,
- ❑ Answering questions related to ATC projects at the West Sub-regional Planning Meetings (SPMs) and other stakeholder forums, and

- ❑ Providing suggestions/comments that help improve the MTEP process.

MISO Transmission Expansion Plan Cost Allocation Types

The MISO Business Practice Manual (BPM) allows for cost sharing of projects through their annual MTEP reliability study. This cost allocation methodology can be broken down into the project types below:

- Baseline Reliability Projects (RECB1)
- Transmission Access Projects (TAP)
  - Generator Interconnection Projects (GIP)
  - Transmission Delivery Service Projects
- Market Efficiency Projects (RECB2)
- Multiple Value Projects (MVP)
- Other Projects
  - Not one of the above. Projects that are not cost shared.

Each cost allocation type listed above has different criteria that a project must meet in order to receive the cost sharing associated with that type. More detailed information on the criteria and cost sharing percentages can be found on the MISO website.

MISO Transmission Expansion Plan 2012 (MTEP12) ATC Projects targeted for Regional Cost Sharing

MTEP Project ID	Project Name	Cost Allocation Type	Estimated Project Cost	MISO Approval Date
3125	2nd Arnold Transformer	Baseline Reliability Project (RECB1)	$16,000,000	Expected in Dec 2012
3679	Green Bay to Morgan 345 kV project and Menominee Co to Delta Co 138 kV line	Baseline Reliability Project (RECB1)	$280,000,000	August 2012
1270	Rebuild Arcadian-Waukesha 138 kV lines	Baseline Reliability Project (RECB1)	$15,000,000	Expected in Dec 2012

Other MISO planning activities

Our Strategic Projects staff also participates in other MISO planning activities such as the Planning Sub-committee and Planning Advisory Committee. Our involvement includes taking part in various technical and policy discussions and providing feedback concerning

the future direction of MTEP activities. ATC also actively participates in other groups including, but not limited to the MISO Interconnection Process Task Force and observes closely several generation interconnection studies included in the System Planning Analysis (SPA) and Definitive Planning Phase (DPP) group studies.

MTEP11 Candidate Multi-Value Project (MVP) Study

As part of MTEP11, MISO hosted a Candidate MVP Study, which would allow MISO to study a portfolio of projects for MVP cost allocation. Seventeen projects were chosen to make up the Candidate MVP Portfolio studied in the MTEP11 process. These 17 projects have been listed and mapped below:

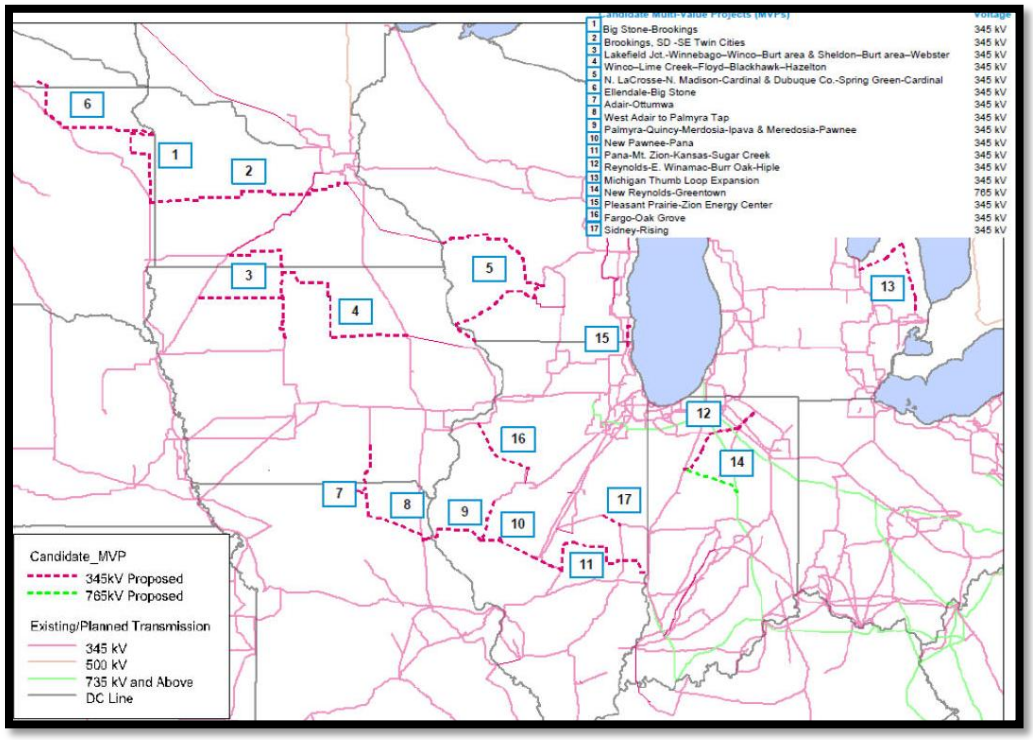

Figure RP-3: Candidate MVP Portfolio map for MTEP11[2]

ATC had 2 Candidate MVP Projects included in the portfolio list above (#5 and #15). More details on ATC's projects can be found within the 10-Year Assessment report. MISO put together a task team to complete the study and ATC's Strategic Projects

[2] This map is from the MISO homepage under the Candidate MVP Portfolio Study at https://www.midwestiso.org/Planning/Pages/MVPAnalysis.aspx

engineers actively participated in the meetings and results review. The portfolio as a whole was looked at to see that each project met one of the three criteria for being designated an MVP project.

To be designated as an MVP, a project must meet one of the three following criteria:

1. must be needed to meet a public policy mandate,
2. must provide economic benefits, including regional benefits, sufficient to meet a 1:1 benefit/cost ratio when you compare twenty years of the costs paid by consumers for the project and twenty years of the benefit,
3. must solve a reliability issue and provide economic benefits as described above and specifically includes those costs for lower voltage projects that would not need to be built if a larger regional project were built.

MISO's Board of Directors Approved the MVP portfolio as designated in the map above for build out in December 2011. To read the final MVP Report or find out more information on the MVP Analysis completed by MISO please go to: https://www.midwestiso.org/Planning/TransmissionExpansionPlanning/Pages/MTEP11.aspx

Badger-Coulee (formerly known as North La Crosse- North Madison-Cardinal) 345-kilovolt project

In addition to MISO's evaluation of the Badger Coulee project we have determined that a 345-kilovolt transmission line from the La Crosse area to the greater Madison area would provide multiple benefits to the state of Wisconsin, including improved electric system reliability, economic savings for utilities and energy consumers, and access to additional renewable energy. As it finalizes its evaluation of the multiple benefits of the project, ATC will continue the public outreach efforts on the proposed Badger Coulee Transmission Line in the 150-mile area from La Crosse to Madison to explore route options for the new line. Since Badger Coulee line has been chosen as a Multi-Value Project under MISO's cost- allocation methodology it will greatly reduce the cost of the line to our customers.

ATC's studies indicate that the Badger Coulee Transmission Line Project is a multi-benefit project that would deliver benefits to Wisconsin and the Midwest region in three important ways:

Improve electric system reliability locally and regionally

- Offset the need for approximately $180 million ($140 million in the ATC service area) in lower-voltage upgrades in western Wisconsin communities

Deliver economic savings for Wisconsin utilities and electric consumers

- Provide increased access to the wholesale energy market and improve grid efficiency
- Could provide $230 to $962 million in net economic benefits over the life of the project

Expand infrastructure for greater use of renewable energy

- Establish another pathway for renewable energy into Wisconsin with connection to key load centers

ATC currently expects to file an application to build the line with the Public Service Commission of Wisconsin in 2013. If approved by the PSC, construction on the new line would begin in 2015 to meet an in-service date of 2018. Transparency and stakeholder engagement have been hallmarks of our planning process from our company's inception. While planning studies for this project continue, we will engage local officials and residents as well as other interested parties on the routing and siting issues again this fall. Because transmission line planning, siting and construction can take between five to 10 years, we want to ensure adequate time for public discussion and input.

For more information or to be emailed updates please visit www.BadgerCoulee.com

Cardinal Bluffs (Formerly known as Dubuque-Spring Green-Cardinal) 345-kilovolt project

The Cardinal Bluffs 345-kV project is also part of MISO's first approved Multi-Value Project Portfolio and has been under study by ATC for the past few years. As part of our analysis on Western WI Reliability needs, a 345-kV transmission line from Dubuque County to Cardinal was found to show benefits for Wisconsin. This line is approximately 104 miles long and has an expected in-service date of 2018. The combination of the Badger Coulee and Cardinal Bluffs 345-kV projects performed the best across all aspects of the reliability analyses. This combination provides additional benefits beyond any of the single 345-kV options and it provides the highest level of transfer capability for wind generation in Minnesota and Iowa. This combination also provided the most net economic benefits across most futures.

Renewable Investment Benefit

Badger Coulee, Cardinal Bluffs and the other projects in western Wisconsin will enable higher-capacity wind generation in Iowa, Minnesota, North Dakota and South Dakota to move more freely to loads to the east, including Wisconsin. Because renewable energy standards require a certain amount of energy (kWh) to be produced, there is the potential

for significant capital cost savings if wind generation is built in higher wind capacity areas than in lower wind capacity areas. We have developed and tested with stakeholders and MISO a process for calculating the value of this benefit, and the dollar savings are included in the savings for both the Badger Coulee 345-kV line and the Cardinal Bluffs 345-kV project.

Pleasant Prairie-Zion Energy Center 345 kV line
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 late this year for an in-service date in 2013.

More information on this project can be found at:
http://www.atc-projects.com/SE-PLPZEC.shtml

CapX2020 (Capacity Expansion - by the year 2020)
ATC also pays close attention to the CapX2020 effort, which is a joint initiative of 11 transmission-owning utilities in Minnesota and the surrounding region. Their objective is to expand the electric transmission grid to ensure reliable and affordable service. CapX2020 includes the following transmission projects:

- ❑ Fargo – St. Cloud – Monticello 345-kilovolt line,
- ❑ Hampton – Rochester – La Crosse 345-kilovolt line,
- ❑ Brookings County – Hampton 345-kilovolt line (Candidate MVP #2),
- ❑ Bemidji – Grand Rapids 230-kilovolt line.

The CapX2020 group filed an application with the Public Service Commission of Wisconsin for the Wisconsin portion of the Hampton – Rochester – La Crosse 345-kilovolt line on and an order was issued by the PSCW in May 2012.

Portions of the CapX2020 projects also will require approvals by federal officials and by regulators in North Dakota and South Dakota. More information about the CapX2020 projects and updates can be found on the CapX2020 Web site at www.capx2020.com.