



# 10-Year Assessment

An annual report summarizing proposed additions and expansions to the transmission system to ensure electric system reliability.

# 2010

September 2010 10-Year Assessment  
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## *2010 10-Year Assessment Executive Summary*

After nearly 10 full years of operation and \$2.2 billion in new and upgraded infrastructure investment, reliability remains our top priority. But looking forward, we see an increasing need for an expanded regional transmission system. Consequently, our planning focus has broadened to consider projects that provide economic and public policy benefits as well. Several factors, including the emerging wholesale market and federal and state policy, play a larger role in our planning process today than they did when we first began operation in 2001.

The majority of the grid's regional interconnections were made in the late 1950s through the early 1970s to accommodate local reliability needs. Nationally, the transmission system was not designed to accommodate the expanded energy flows required by the current wholesale market place.

Renewable portfolio standards also call for a more robust regional grid to move power from wind-rich areas west of Wisconsin to population centers where the electricity is consumed. The changed market place and increasing importance of renewable energy sources necessitate a broader view of the system, which influences planning policies and studies.

Since our inception, load growth and operational issues were the primary drivers for transmission improvements, and planning studies were conducted accordingly. Today, finding a way to build the system to allow states to meet their renewable energy standards and getting the full benefit of the Midwest ISO market for ATC customers have become more significant transmission needs. We continue to collaborate with customers and other stakeholders to plan best-value projects that meet system needs and provide multiple benefits.

Because of the changing conditions, we are including a new section in this year's assessment to discuss emerging projects, including the larger regional needs and the impact they are having on our planning efforts.

The 2010 Assessment covers the years 2010 to 2019, and for the second year, we have included asset renewal projects through the full 10-year horizon. Our studies indicate \$3.4 billion in necessary transmission system improvements. The total includes \$1.0 billion for transmission network upgrades, \$0.7 billion for regional multi-benefits projects, along with \$1.7 billion in interconnection and asset renewal projects, infrastructure replacement and relocation, and other smaller network reliability improvements.

The planning zone summaries in this report detail the specific projects identified for improved reliability, access to the market as well as renewable energy resources. A more comprehensive description of these plans is available at our web site [www.atc10yearplan.com](http://www.atc10yearplan.com).

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## Capital cost

Based on this 2010 Assessment, the total cost estimate for needed transmission system improvements is about \$3.4 billion over the next 10 years (through 2019). The total \$3.4 billion in projects, expressed in constant (inflation adjusted) year dollars, can be broken down into the following categories.

Category	2009 10-year capital estimate in billions	2010 10-year capital estimate in billions
10-Year Assessment projects	\$0.97	\$0.98 <sup>1</sup>
Asset Renewal	\$0.70	\$0.70
Generator interconnections	\$0.17	\$0.20
Distribution interconnections	\$0.17	\$0.25
Protection & control	\$0.07	\$0.11
Network	\$0.09	\$0.05
Unspecified network projects	\$0.26	\$0.30
Other <sup>2</sup>	\$0.11	\$0.08
<b>Net expenditures</b>	<b>\$2.54</b>	<b>\$2.67</b>
Regional multi-benefits projects	\$0.00	\$0.75
<b>Total expenditures</b>	<b>\$2.54</b>	<b>\$3.42</b>

<sup>1</sup> \$0.98 billion includes Point Beach network upgrades and Bain-Zion. Projects were not studied for reliability standards in the 2010 Assessment but are expected to be candidates for inclusion in the 2011 Assessment.

<sup>2</sup> Other includes Administration & General, Asset Acquisition, Asset Contribution, and Infrastructure Relocation.



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The total cost trends of the last five assessments and updates are as follows:

	Nov 2006	Nov 2007	Oct 2008	Oct 2009	Sept 2010
10-Year Assessment Projects	\$1.7B	\$1.4B	\$1.3B	\$1.0B	\$1.0B
Other Capital Expenditures	\$1.4B	\$1.4B	\$1.4B	\$1.5B	\$1.7B
Regional multi-benefits projects	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7B
Total 10-Year Capital Cost	\$3.1B	\$2.8B	\$2.7B	\$2.5B	\$3.4B

In the 2010 Assessment, we project an increased total cost estimate for all needed transmission system improvements over a rolling 10-year period. Although the proportionate share of cost of projects specifically detailed in the assessments has been relatively constant, the overall total is increasing mainly as a result of the addition of the two large regional multi-benefits projects: La Crosse-Madison (Badger Coulee) and the Dubuque-Spring Green-Madison 345-kV project.

Other issues that can influence the total 10-year cost up or down as each future assessment is completed include the following factors:

- Addition of regional multi-benefits projects that provide reliability, economic and public policy benefits,
- Completion of prior projects,
- Changing load forecast,
- Changes in generation and distribution interconnection projects,
- Improved resource planning to manage construction projects,
- Changes in mandatory reliability standards,
- Additional projects that are driven by economic benefits, and
- Changing equipment and labor costs.

This report only reflects the estimated costs of the projects included in the 10-year Assessment. It does not address the responsibility of customer groups for the revenue requirements associated with the projects, or any cost sharing that would occur as a part of the Midwest Independent System Operator’s approved tariffs on cost allocation.

Referring to the breakdown of the 2010 total cost, unspecified network projects are defined as those projects that may shift into the 10-year timeframe because of factors listed earlier.



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This \$300 million represents anticipated costs from projects not defined in the assessment, but potentially driven by some combination of the following issues that we continue to analyze:

- Reliability impacts to our customers, both short- and long-term
- Regional impacts to our customers,
- Economic impacts to our customers, and
- Multiple outage impact solutions.

Future assessments will continue to define these unspecified projects as issues are further defined in the continuing planning process.

Table 2010 Financial outlines the costs of network and economic assessment projects and ATC construction projects overall.

### **Reliability for renewable energy: helping states meet their renewable goals**

In addition to providing updated need and project information, the 2010 Assessment presents information regarding our involvement in regional and inter-regional transmission system studies that support wind generation development. Please refer to Regional Planning for more information.

Developments in the Upper Midwest and the Eastern Interconnection could affect us and/or our customers. Among the more relevant of these include renewable portfolio standards, transmission initiatives being investigated by the Midwest ISO, and wind generation developments. The latest developments are summarized below.

- Midwest ISO Regional Generation Outlet Study I and II (RGOS)*  
The Midwest ISO initiated the RGOS as a targeted study to identify a set of regionally coordinated transmission projects that interconnect and deliver new wind generation based on renewable portfolio standards in an 11-state region. Phase I of this effort focused on renewables needed in the western portion of the Midwest ISO (North Dakota, South Dakota, Illinois, Iowa, Minnesota and Wisconsin).

The Phase I RGOS report was finalized in March 2010. The report developed 12 transmission expansion options that could deliver the renewables required by the four states. Eight of these transmission expansion options were 345-kV options and four were 765-kV options. Two regional projects that ATC is actively studying – the La Crosse-Madison 345-kV line and a Dubuque-Spring Green-Madison 345-kV project – were part of all of the 345-kV solutions MISO developed.

RGOS II - the Midwest ISO kicked off Phase II in May 2009 prior to completion of Phase I and continues to develop regional transmission alternatives needed to meet new or



expanded renewable portfolio standards in a larger geographic region covering 11 Midwestern states. The effort is looking at the transmission needed to support 40,000 megawatts of wind generation in this area. Midwest ISO, working with transmission owners and stakeholders, has developed three transmission expansion designs - a mostly 345-kV design, a 345-kV design with High Voltage Direct Current (HVDC) lines, and a 765-kV design. The final report for this study is due out later this year. Please refer to the Regional Planning section for more information.

□ *Upper Midwest Transmission Development Initiative (UMTDI)*

The governors of five states (North Dakota, South Dakota, Minnesota, Iowa and Wisconsin) launched this initiative in September 2008. The goal is to promote regional electric transmission investment and cost sharing that supports these states' commitment to cost-effective renewable generation while maintaining reliability. A major input that is supporting this effort is the RGOS Phase I transmission planning, described above. UMTDI used this as the basis for making choices as to which transmission corridors should initially be considered. We, along with other transmission owners and stakeholders in these five states, have been participating in both the UMTDI and Midwest ISO efforts.

UMTDI is currently reviewing the RGOS Phase I report to determine which identified projects should be recommended to the Governors of the five states. The Midwest ISO, in a separate effort, is developing a cost-allocation methodology for Multi-Value Projects – regional projects designed to move renewable generation and to provide reliability and economic benefits as well. This cost-allocation methodology was filed with the Federal Energy Regulatory Commission (FERC) in July 2010. UMTDI has decided to rely on Midwest ISO's efforts for determining the appropriate cost allocation of any regional, renewable multi-benefits projects they choose for further study and implementation.

□ *SMARTransmission Study*

The currently underway Strategic Midwest Area Renewable Transmission (*SMARTransmission*) Study is a collaborative effort among ATC, Electric Transmission America (a transmission joint venture of subsidiaries of American Electric Power and MidAmerican Energy Holding Co.), Exelon, Xcel Energy and NorthWestern Energy Corp. to identify potential extra-high voltage (345-, 500- and 765-kilovolt) projects that could be needed to move wind power within an eleven-state region from the Dakotas to Ohio, including areas covered by the RTOs of SPP, MISO and PJM.

As part of this study, transmission alternatives have been identified to move 56,000 megawatts of wind within the 11-state region identified. This amount of wind would be sufficient to meet a minimum 20 percent renewable portfolio standard in all of the states and higher RPSs for those states that have mandated higher standards. Eight



transmission designs were studied to determine their reliability performance and two designs were chosen for economic analysis. Stakeholders have been involved in the study throughout its progress. The study will be completed in the summer 2010.

The outcome of the *SMARTransmission* Study in combination with other studies currently being performed by the Midwest ISO will be used as input to the regional transmission planning processes and result in transmission projects being identified for further study and possible implementation.

### **Planning for a reliable future**

Since publishing last year's assessment, in addition to the economics-driven Paddock – Rockdale 345-kV project described below, we've energized a number of components that provide reliability benefits to our customers.

- ❑ Jefferson-Tyrannena-Stony Brook – Construction was completed on a new 14-mile 138-kilovolt line that supports a new customer interconnection and addresses low voltages and thermal overloads.
- ❑ Conover – Plains conversion to 138 kilovolt – This 73-mile voltage conversion addresses long-term reliability issues of the Rhinelander Loop, provides substantial voltage support to the 69-kilovolt system in the western portion of the Upper Peninsula and addresses potential long-term condition issues due to the age of the existing 69-kilovolt system.

### *T-D interconnections*

Another aspect of reliability involves customers' distribution and/or generator interconnections. Several unanticipated large, end-use customer interconnections continue to develop within our service territory. Type, size and location of such interconnections have varied throughout the year. Many require an expedited response to determine if the system is equipped to support the unanticipated load.

Since publishing last year's assessment, in addition to the Jefferson-Tyrannena-Stony Brook 138-kilovolt line described above, we've energized several projects to interconnect new customers, including:

- ❑ Brandon – Fairwater – Construction was completed on a new 4-mile 69-kilovolt line that supports a new customer interconnection in the area.
- ❑ Oak Ridge – Verona – Construction was completed on a new 6-mile 138-kilovolt line that supports a new customer in the area.

For more information, see [T-D Interconnections](#).





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## *Generator interconnections*

While natural gas generation dominated new energy proposals in recent years, new proposals now focus on wind generation. Currently, 17 proposals to install more than 2,500 megawatts of wind turbines in Wisconsin are in the Midwest ISO generation queue.

Generator interconnection studies have been performed for significant modifications at the Point Beach Nuclear Plant. These modifications will prepare the unit for years of continued reliable base load operation as well as provide a large amount of additional generating capacity. Our studies indicate that the additional output from these generating units and the substantial equipment modifications will result in overloads and system instability if the transmission system in the area is not reinforced. The reinforcements identified by the reliability assessment include the following transmission projects:

- ❑ Construct a new 345/138-kilovolt substation (tentatively named North) near the northern intersection of the Point Beach – Sheboygan Energy Center 345-kilovolt and the Forest Junction – Howards Grove 138-kilovolt lines,
- ❑ Construct a new 345/138-kilovolt substation (tentatively named East) near the intersection of the Edgewater – South Fond du Lac 345-kilovolt and the Howards Grove – Holland 138-kilovolt lines,
- ❑ Convert the existing double-circuit line (345/138-kV) between Forest Junction and the new North Substation and between the new North and East substations to double-circuit 345-kilovolt lines (approximately 51 miles), and
- ❑ To keep the existing Plymouth and Howards Grove substations networked, a new 138-kilovolt line is proposed between the new “East” and Erdman Substations (approximately 13 miles), including looping into the Plymouth and Howards Grove Substations.

The Point Beach upgrade projects listed above did not meet the criteria of having an executed interconnection agreement in time for specific inclusion into this 10-Year Assessment for modeling and analyses purposes. It is anticipated that these requirements will be met for upcoming Assessment(s), therefore the cost was included in the 10-year capital forecast.

Since publishing last year’s assessment, we’ve energized a 650-megawatt (615-megawatt net) addition to the Oak Creek Power Plant. The second 615-megawatt (net) unit is scheduled to be in service in 2010.

For more on generation developments in Wisconsin and Michigan’s Upper Peninsula, see [Generation Interconnections](#).



### **Engaging the public in our plans**

Our approach to transmission planning is built upon two critical foundations – comprehensive engineering analyses and collaboration with stakeholders.

We are continually assessing and reassigning the needs of existing and anticipated system users, individually and collectively, according to accepted industry system performance criteria and practices. Our goal is to initially determine, and then evolve over time, the best set of transmission projects to address those needs.

In addition to identifying reliability-based projects to address system needs, we are engaging stakeholders to identify the most important economic benefit projects. Through collaboration with stakeholders, projects to connect our system to renewable energy from the west and to relieve congestion around southern Lake Michigan have been identified for economic analysis in 2010. Seven alternatives have been identified to connect our system to renewable resources in the west, including multiple variations of a La Crosse – Madison area 345-kilovolt circuit, a low-voltage alternative to this path, a 765-kilovolt by-pass of this path, and a Dubuque, Iowa, to Madison area 345-kilovolt alternative. Both the La Crosse-Madison area 345-kV and the Dubuque, Iowa-Madison 345-kV lines have been identified by the Midwest ISO as “likely” Multi-Value Projects, eligible for cost sharing across the entire MISO area. MISO will determine which projects will be deemed Multi-Value Projects in 2011.

The economic analysis studies of these seven project alternatives will determine the economic benefits that each alternative may provide to the ATC footprint. This information can be combined with the results of other studies to determine which project alternatives merit further investigation.

In order to relieve congestion around southern Lake Michigan, a 345-kilovolt circuit connection southeast Wisconsin to northeast Illinois will be studied as well as an underwater High Voltage Direct (HVDC) line connecting Wisconsin and Michigan. ATC is working with stakeholders to identify alternatives for these analyses and will be performing studies in 2010/2011.

This process also uses pre-analysis stakeholder input and is described more thoroughly in the [Economic Analysis](#) section.





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Besides those described in the Reliability for renewable energy section described above, several collaborative efforts are underway and are described below:

❑ *ATC Energy Collaborative-Michigan*

Even with significant upgrades to transmission infrastructure in the Upper Peninsula in recent years, operational challenges remain due to the delicate balance among generation, load, market flows and transmission that currently exists.

To verify our planning assumptions for the intermediate (three- to five-year) and long-term (10- to 15-year) periods before future projects are proposed, we engaged U. P. stakeholders during 2008 in a collaborative process to examine the bounds of several plausible futures. We developed a set of core transmission system needs across the Upper Peninsula, and we are continuing to work with stakeholders on a plan that will provide continued reliability and more operational flexibility. This plan may impact the Lower Peninsula of Michigan and Canada, as well as the U.P. and northern Wisconsin.

In 2010, we began the analyses of an additional high-retirements scenario as part of this Collaborative, which will determine the potential impact if generation is retired in the U.P. Please refer to our U.P. Collaborative section for more details.

❑ *Eastern Interconnection Planning Collaborative (EIPC)*

The EIPC consists of a group of 26 Planning Authorities, working with the Department of Energy to develop conceptual Eastern Interconnection-wide transmission plans. ATC is an active participant in EIPC, which submitted a bid to perform Eastern Interconnection-wide planning in response to a DOE funding opportunity in the fall of 2009. The DOE accepted the bid of the EIPC and will provide \$16 million toward the development of transmission designs to meet a number of stakeholder- specified scenarios. The scenarios will be developed by a Stakeholder Steering Committee with input from any interested parties throughout the process. A contract will be signed in 2010 and the first report is due in June 2011. More information can be found at [www.eipconline.com](http://www.eipconline.com).

❑ *Eastern Wisconsin Collaborative* – An effort to identify, prioritize and coordinate the evaluation and analysis of performance challenges in eastern Wisconsin. The first phase has reviewed congestion and reliability issues in southeastern Wisconsin. Reliability analysis has not indicated the need for additional reliability upgrades over and above what was identified in our normal Assessment process. Market congestion analysis has led to the development of some smaller upgrades in this area and the identification of an economic project need in the Racine-Bain-Zion Energy Center (IL) corridor.



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Area upgrades identified to date are as follows:

- Uprate the Pleasant Prairie – Zion 345-kilovolt line (2010),
- Install a 345-kilovolt wave trap at Zion Substation (2010), and
- Construct a Bain – Zion 345-kilovolt line (future).

The Eastern Wisconsin Collaborative effort is ongoing and our progress will be outlined in future assessments.

## Asset renewal

Our asset management department works closely with planning to maintain and improve system reliability. Focused on life-cycle management of our transmission system, asset renewal is the “replacement strategy” of the asset life cycle. Asset renewal is driven by public and worker safety, regulatory compliance, reliability performance and environmental stewardship.

We benchmark our transmission line performance with 26 other operators that comprise nearly half of the nation’s grid. Our 115- and 138-kV lines were best in class, and the 69-kV lines were in the top ten percent. While the lines generally perform well, targeted investment will be required to maintain reliability as a number of facilities have been identified as near end of life, or have components that are at end of life.

While the top goal is always public and worker safety, two of the major objectives for our Asset Management department are to minimize the total life-cycle cost and to manage the risk of aging infrastructure. Knowing and managing the costs and risks help us identify the best-possible system improvements that serve multiple purposes and reduce overall cost. This year’s assessment includes approximately \$700 million in asset renewal work, which includes maintenance and protection projects. Please refer to our [Asset Renewal](#) section and the [2010 Asset Renewal Financial Table](#) for details.

## Improved access to market helps lower costs

The infrastructure improvements we have made in the last 10 years have eased constraints on our system and allowed our customers access to lower-cost sources of electricity. We track wholesale electricity prices within our footprint and at three neighboring market hubs. When the Midwest market was established in 2005, the average locational marginal price within our footprint was \$63.27 per megawatt hour, more than \$10 higher than the average in our neighboring hubs. In 2009, the difference was only \$1.27 per mWh.

Access continues to be an emphasis in our planning studies.

One project that has been identified in several of the planning efforts listed above is the La Crosse-Madison 345-kV project. The studies show multiple benefits – moving renewable energy into Wisconsin and throughout the Midwest, providing economic benefits by



reducing energy costs throughout the ATC and Midwest ISO footprints by reducing congestion and line losses, and enhancing local reliability while offsetting the need to construct lower-voltage lines. Building this line would eliminate the need for 10 lower-voltage projects, reducing the total length of line to be built or upgraded by 80 miles.

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 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.

### **Ever mindful of the environment**

With a construction program of nearly \$250 million each year, we recognize that our work has an impact on the environment. We take our commitment to environmental protection and stewardship seriously – our goal is to avoid making impacts where we can, minimize those that can't be avoided and restore the environment. In some instances, we can improve conditions when our work is finished. Please refer to [Routing & Siting](#) for details regarding our environmental efforts.

### **Regional, Multi-Benefits Projects**

- *La Crosse-Madison 345-kilovolt line and Dubuque-Spring Green-Madison* - We continue with efforts begun in 2008 to work with stakeholders in identifying projects that provide economic benefits and upgrades that could improve access to lower-cost sources of power inside and outside our service territory. Subsequent to the 2008 analysis, ATC began studying La Crosse-Madison, Dubuque-Spring Green-Madison and related projects as multi-benefits projects – projects that would provide reliability benefits, economic savings and the ability to move renewable energy as described below:

#### *1. Western Wisconsin Reliability Study*

As part of that effort to study the impacts of increased wind generation in western Wisconsin, southeastern Minnesota and northeastern Iowa, ATC has worked with several transmission owners to perform the joint Western Wisconsin reliability study. This study is currently underway with participation by ATC, Xcel Energy; Dairyland Power Cooperative; Great River Energy; International Transmission Co., Midwest; Southern Minnesota Municipal Power Agency; and coordination with the Midwest ISO. The purpose is to investigate reliability needs in western Wisconsin, and to identify projects that could address those needs. This study identified many reliability needs that would be partially solved by 345-kV transmission in western Wisconsin. A report is expected to be complete in the summer of 2010.



2. *Economic Study*

ATC has worked with stakeholders in 2009 and 2010 to specify a range of plausible futures to analyze the economic benefits of La Crosse-Madison, Dubuque-Spring Green-Madison and other projects in western Wisconsin. The results of those studies will be available by the end of 2010 or early 2011.

3. *Renewable Benefit*

La Crosse-Madison, Dubuque-Spring Green-Madison and the other projects in western Wisconsin will enable the 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. ATC is investigating how to quantify that benefit.

These multi-benefits projects are not listed specifically in our reliability and economic project tables because the solutions were not sufficiently developed when our traditional 10-Year Assessment process began. However, it is anticipated that the requirements for these projects will be met and the projects will be fully vetted in future assessments. The dollars for these projects are accounted for in our 10-year budget and are listed separately as regional multi-benefits projects.

### **Relieving Market Congestion**

The Midwest ISO Day 2 market, which ushered in the daily and hourly energy market in the Midwest, was first implemented in April 2005. Since that time, ATC has developed transmission to relieve market congestion where building the transmission saved ultimate ratepayers enough money to offset the cost of the transmission. The first major project approved on this basis was the Paddock-Rockdale project, which was placed in service in 2010.

- Paddock – Rockdale – This new, 35-mile, 345-kilovolt transmission line was the first transmission line project within the Midwest ISO footprint that was justified on economics – allowing our customers improved access to the regional energy market to buy and sell electricity when it is economic to do so. The project was completed ahead of schedule and within the approved budget. Savings from the project are expected to more than pay for its development.

Energy is sold in the Midwest ISO market on an hour-by-hour basis with the most cost-effective generators being dispatched first unless there are transmission constraints preventing the energy from getting to the loads that need to be served. Relieving economic congestion will allow ATC utilities to import power during those hours when



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outside resources are less expensive and could save utilities, and ultimately their customers, money. This is the case with the Paddock-Rockdale line. Relieving economic congestion will also, during some hours, allow ATC generators to sell more power to higher- cost regions and return the profits to their customers. ATC is pursuing projects that will allow more export from the southeastern area of our service territory.

- *South Lake Michigan Congestion Study* – The market congestion issues impacting southeast Wisconsin are part of a larger regional market congestion issue that extends south of Lake Michigan into Illinois and Indiana. Both ATC and the Midwest ISO are working to identify short-, medium- and long-term fixes to the congestion issues.

We have committed to perform detailed economic analysis in this area as part of our annual stakeholder-driven economic analysis. We also have committed to undertake the study of an HVDC line across Lake Michigan as part of the effort to relieve market congestion.

As part of this effort, studies have begun to analyze the benefits of a potential six-mile, 345-kV line from the Bain Substation in Kenosha County to the Zion Energy Center in Illinois. Our studies thus far indicate potential economic benefits to ATC, adjacent utilities, and our customers.

The Bain-Zion project did not meet the criteria for specific inclusion into this 10-Year Assessment. However, it is anticipated that the requirements will be met for upcoming Assessment(s). Information regarding this project and its related studies is included as it represents developing solutions to significant emerging issues.

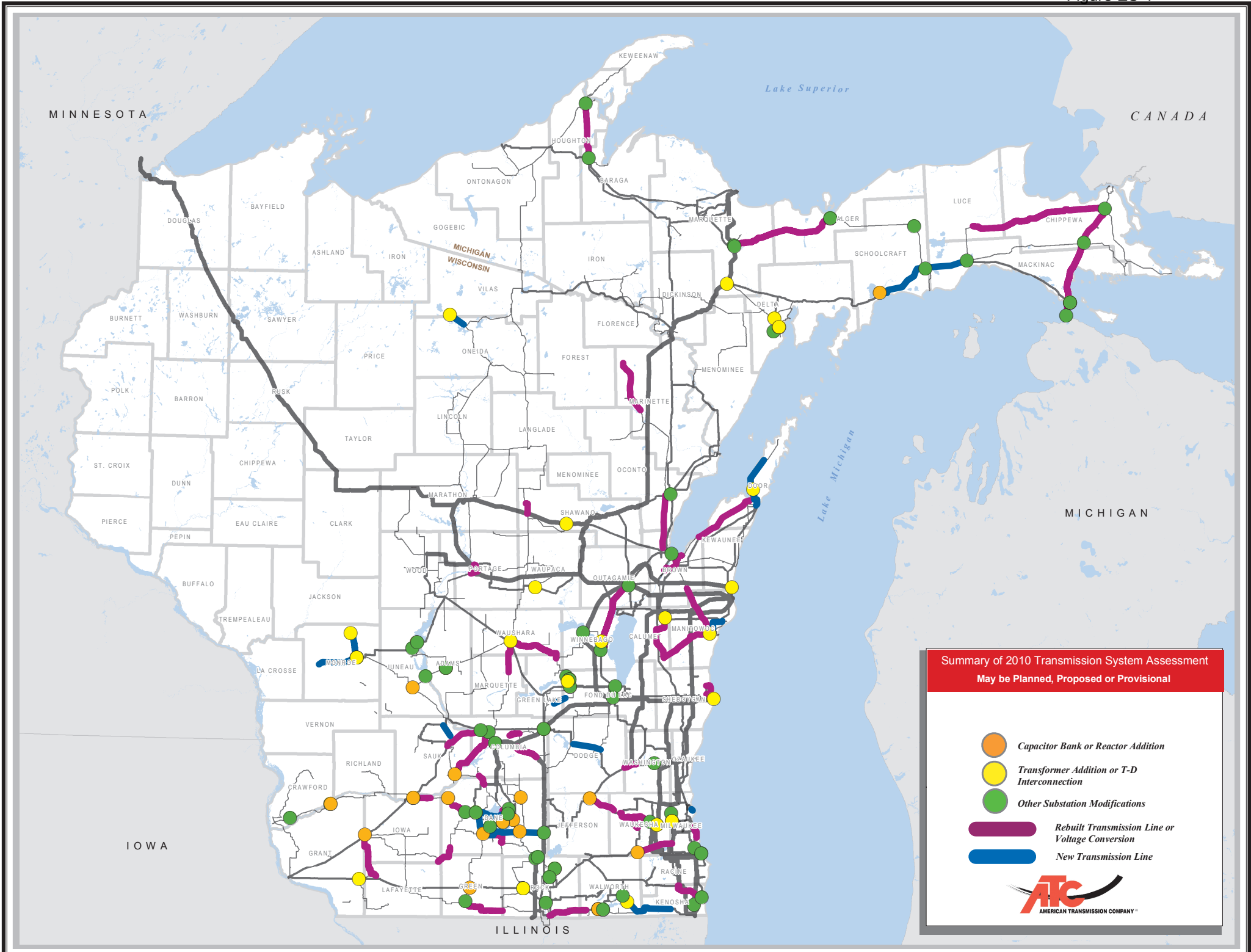
For more information regarding our efforts to relieve market congestion, please refer to the [Economic Analysis](#) section.

**Table ES-1  
Summary of American Transmission Co.'s  
2010 Transmission System Assessment**

	<b>2009 Assessment</b>	<b>2010 Assessment</b>
	(October 2009)	(September 2010)
<b><i>New Transmission Lines Requiring New Right-of-Way</i></b>		
345 kV	1 lines / 32 miles	3 lines / 230 miles*
138 kV	7 lines / 62 miles	7 lines / 53 miles
115 kV	1 line / 7 miles	1 line / 7 miles
69 kV	6 lines / 30 miles	4 lines / 24 miles
<b><i>Transmission Lines to be Constructed, Rebuilt, Reconductored or Upgraded on Existing Right-of-Way</i></b>		
345 kV	2 lines / 50 miles	0 lines / 0 miles
161 kV	1 line / 18 miles	1 line / 18 miles
138 kV	10 lines / 243 miles	8 lines / 135 miles
69 kV	11 lines / 88 miles	12 lines / 157 miles
<b><i>New Transformers to be Installed</i></b>		
<b><i>(# of transformers / total increase in capacity)</i></b>	21 transformers / 2,827 MVA	24 transformers / 3,528 MVA
<b><i>New Capacitor Banks to be Installed</i></b>		
<b><i>(# of installations / capacity)</i></b>	29 installations / 1,100 MVAR	21 installations / 956 MVAR

*\*includes regional multi-benefits project mileages*





**Summary of 2010 Transmission System Assessment**  
 May be Planned, Proposed or Provisional

- Capacitor Bank or Reactor Addition
- Transformer Addition or T-D Interconnection
- Other Substation Modifications
- Rebuilt Transmission Line or Voltage Conversion
- New Transmission Line



ATC 2010 10-Year Assessment  
Summary of Network Capital Expenditures (2010-2019)  
10-Year Assessment Project Detail

FP	10-Year Assessment Network Project Description	Sum of Previous Expenditures as of 12/31/2009	Sum of Future Expenditures 2010-2019	Total Capital Expenditures 2001-2019
F0181	Construct a second Dunn Road-Egg Harbor 69-kV line	\$0	\$6,097,935	\$6,097,935
F0339	Install a second 138/69-kV transformer at Hillman	\$0	\$4,817,493	\$4,817,493
F1282	Pine River capacitor banks and bus reconfiguration	\$8,601,402	\$125,931	\$8,727,332
F1358	Construct 138-kV line from Canal to Dunn Road	\$263,744	\$21,792,179	\$22,055,923
F1361	Rebuild 2.37 miles of 69 kV from Sunset Point to Pearl Ave with 477 ACSR	\$675,592	\$2,575,204	\$3,250,796
F1407	Construct Oak Ridge-Verona 138-kV line	\$13,828,799	\$3,362,054	\$17,190,853
F1435	Construct 345-kV line from Rockdale to West Middleton	\$1,673,870	\$178,051,227	\$179,725,097
F1444	Uprate Y-40 Gran Grae-Boscobel 69-kV line to achieve a 99 MVA summer emergency rating	\$832,460	\$4,960,988	\$5,793,447
F1602	Rebuild part of the Y-8 Dane-Dam Heights 69-kV line	\$177,059	\$6,482,534	\$6,659,593
F1638	Construct a Lake Delton-Birchwood 138-kV line	\$0	\$7,996,469	\$7,996,469
F1640	Construct a Horicon-East Beaver Dam 138-kV line	\$0	\$49,515	\$49,515
F1670	Y32 Colley Road-Brick Church uprate	\$0	\$29,585,000	\$29,585,000
F1729	Elm Road TSR Phase II circuit breakers	\$1,149,573	\$4,189	\$1,153,762
F1844	Construct Brandon-Fairwater 69-kV line	\$1,921,929	\$54,330	\$1,976,260
F1867	Replace 138/69-kV transformer at Metomen	\$0	\$4,385,418	\$4,385,418
F1868	Uprate Y-61 Sheepskin-Dana 69-kV line to 95 MVA	\$34,249	\$0	\$34,249
F1869	Install transformer and bus at Bass Creek	\$747,442	\$4,146,836	\$4,894,279
F1981	Construct Paddock-Rockdale 345-kV line	\$100,865,080	\$7,883,595	\$108,748,675
F2016	Uprate Chandler-Cornell 69-kV line	\$602,062	\$91,962	\$694,024
F2079	Replace Glenview transformer	\$0	\$432,240	\$432,240
F2080	Sunset Point transformer replacements	\$0	\$0	\$0
F2081	Shoto-Custer 138-kV line	\$0	\$0	\$0
F2086	Pleasant Valley T-D (second transformer)	\$92,846	\$1,541,653	\$1,634,499
F2088	Fitchburg-Nine Springs Uprate	\$142,192	\$5,209,540	\$5,351,732
F2092	Uprate Portage-Trienda 138-kV line	\$0	\$40,950	\$40,950
F2093	North Randolph 500 MVA transformer	\$0	\$0	\$0
F2105	Construct Fairwater-Mackford Prairie 69-kV line	\$0	\$5,679,773	\$5,679,773
F2135	Uprate Columbia 345/138-kV transformer T-22 to 527 MVA	\$0	\$108,590	\$108,590
F2140	Elm Road Phase II Upgrades	\$12,598,071	\$25,332	\$12,623,403
F2142	Uprate Arcadian-Waukesha 138-kV lines KK9942/KK9962	\$93,367	\$222,819	\$316,185
F2153	Uprate Brick Church-Walworth 69-kV line to 115 MVA	\$0	\$461,917	\$461,917
F2173	Warrens DIC	\$2,097,479	\$4,405,635	\$6,503,114
F2223	Install 1-16.33 MVAR capacitor bank at Indian Lake 138-kV Substation	\$86,444	\$2,014,703	\$2,101,146
F2317	Royster Substation breaker replacement	\$387,036	\$313,263	\$700,299
F2324	Lamar DIC	\$1,989,746	\$308,448	\$2,298,194
F2327	Spring Green capacitor banks	\$1,580,223	\$57,792	\$1,638,015

ATC 2010 10-Year Assessment  
Summary of Network Capital Expenditures (2010-2019)  
10-Year Assessment Project Detail

FP	10-Year Assessment Network Project Description	Sum of Previous Expenditures as of 12/31/2009	Sum of Future Expenditures 2010-2019	Total Capital Expenditures 2001-2019
F2371	Install a second 138-kV reserve auxiliary transformer at Kewaunee and remove tertiary auxiliary transformer	\$2,484,734	\$37,943	\$2,522,677
F2404	Brick Church capacitor banks	\$111,191	\$3,445,015	\$3,556,206
F2405	Uprate Y-79 McCue-Milton Lawns 69-kV line	\$373,218	\$908,242	\$1,281,460
F2437	Kewaunee SS-Bus Reconfiguration	\$423,993	\$14,153,468	\$14,577,461
F2445	Install a second 138/69-kV transformer at Spring Green with a 100 MVA summer normal rating	\$0	\$4,715,022	\$4,715,022
F2454	Construct Monroe County-Council Creek 161-kV line	\$123,405	\$34,787,681	\$34,911,086
F2461	Uprate Bain-Albers 138-kV line	\$42,570	\$196,871	\$239,441
F2466	West Middleton-Blount 138-kV line	\$0	\$51,662,639	\$51,662,639
F2469	Rebuild the Verona to Oregon 69-kV line Y119	\$47,891	\$5,580,463	\$5,628,354
F2471	6986 Royster-Sycamore uprate	\$0	\$1,643,315	\$1,643,315
F2472	North Monroe 69-kV capacitor banks	\$0	\$2,336,040	\$2,336,040
F2473	Oak Creek-Pennsylvania 138-kV Line KK837 Upgrade	\$0	\$0	\$0
F2474	Dam Heights 69-kV capacitor banks	\$0	\$2,896,361	\$2,896,361
F2475	Sun Prairie 69-kV capacitor banks.	\$0	\$1,828,210	\$1,828,210
F2477	Ripon Substation capacitor banks	\$0	\$885,920	\$885,920
F2480	Wautoma Substation second transformer	\$0	\$4,029,502	\$4,029,502
F2487	Shorewood-Cornell underground 138-kV Line	\$717,584	\$4,947,847	\$5,665,431
F2489	Concord capacitor bank installation	\$0	\$152,904	\$152,904
F2491	Uprate Castle Rock-Mckenna 69-kV line	\$0	\$1,093,828	\$1,093,828
F2493	Mukwonago Capacitor bank	\$0	\$553,960	\$553,960
F2495	Construct 115-kV line from new Woodmin Substation to the Clear Lake Substation	\$0	\$22,928,541	\$22,928,541
F2515	Eden 69-kV capacitor banks	\$0	\$1,643,279	\$1,643,279
F2516	Femrite capacitor banks	\$0	\$870,038	\$870,038
F2517	Mazomanie 69-kV capacitor banks	\$0	\$1,436,822	\$1,436,822
F2518	Boscobel SS 69-kV capacitor banks	\$0	\$1,752,230	\$1,752,230
F2519	McKenna and Chaffee Creek 69-kV capacitor banks	\$0	\$679,676	\$679,676
F2520	Verona capacitor bank	\$0	\$1,743,708	\$1,743,708
F2526	Y33 Brodhead-South Monroe rebuild	\$306,304	\$11,260,493	\$11,566,796
F2532	Lakehead 69-kV line uprate	\$182,253	\$267,953	\$450,206
F2539	Arcadian transformer replacements	\$0	\$8,711,859	\$8,711,859
F2558	Construct 69-kV double-circuit line between McCue and Lamar substations	\$0	\$8,522,646	\$8,522,646
F2560	Convert Necedah distribution substation from 69 kV to 138 kV	\$0	\$761,500	\$761,500
F2570	Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	\$0	\$80,034,630	\$80,034,630
F2587	Construct new 138-kV line from North Lake Geneva to South Lake Geneva Substation	\$0	\$15,726,632	\$15,726,632
F2628	Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	\$386,470	\$7,240,212	\$7,626,682
F2650	Install 3-75 MVAR capacitor banks at Bluemound Substation	\$43,045	\$3,394,133	\$3,437,178

ATC 2010 10-Year Assessment  
Summary of Network Capital Expenditures (2010-2019)  
10-Year Assessment Project Detail

<i>FP</i>	<i>10-Year Assessment Network Project Description</i>	<i>Sum of Previous Expenditures as of 12/31/2009</i>	<i>Sum of Future Expenditures 2010-2019</i>	<i>Total Capital Expenditures 2001-2019</i>
F2833	Rebuild/convert Straits-Pine River 138-kV lines 6904/5	\$0	\$36,213,063	\$36,213,063
F2836	Uprate Pine River-Nine Mile 69-kV line 6923 to 167 degrees F and asset renewal for 6921/3	\$0	\$23,147,608	\$23,147,608
F2874	Uprate Council Creek-Petenwell 138-kV line	\$0	\$210,426	\$210,426
F2894	Install power flow control at Straits 138-kV Substation	\$0	\$83,985,355	\$83,985,355
F2966	Install reactors at Straits Substation	\$0	\$2,476,428	\$2,476,428
F3008	Install 1-32.66 MVAR 138-kV capacitor bank at Kegonsa Substation	\$0	\$1,033,215	\$1,033,215
F3036	Replace Petenwell 138/69-kV transformer	\$0	\$3,410,143	\$3,410,143
F3040	Install second 138/69-kV transformer and a 138-kV ring bus at Chandler Substation	\$0	\$7,885,954	\$7,885,954
F3046	Reconfigure Petenwell 138-kV bus	\$0	\$164,613	\$164,613
F3062	Uprate Winneconne-Sunset Point 69-kV line Y-103	\$0	\$11,665,661	\$11,665,661
F3063	Replace existing 56 MVA Harrison 138/69-kV transformer with a 100 MVA transformer	\$0	\$3,216,697	\$3,216,697
F3066	Install/replace 69-kV breakers at Delta Substation	\$0	\$3,481,758	\$3,481,758
F3068	Energize Hiawatha-Indian Lake at 138 kV	\$0	\$4,849,964	\$4,849,964
F3071	Uprate Munising-Seney-Blanney Park 69-kV line to 167 degrees F	\$0	\$11,076,749	\$11,076,749
F3073	Relocate Engadine 69-kV load	\$0	\$805,921	\$805,921
F3077	Construct 18th Road-Chandler double circuit 138-kV lines and operate at 138/69	\$0	\$28,602,139	\$28,602,139
F3080	Construct a new Arnold 345-kV Substation and install a 345/138-kV transformer	\$0	\$15,706,606	\$15,706,606
F3103	Uprate 6927 West Middleton-Stage Coach 69-kV line to 106 MVA SE	\$0	\$1,781,658	\$1,781,658
<b>2010 TYA Totals Reported</b>		<b>\$0.2B</b>	<b>\$0.8B</b>	<b>\$1.0B</b>
<b>Plus Point Beach 2018 area upgrades and Bain-Zion</b>			<b>\$0.2B</b>	
<b>Plus projects completed prior to 1/1/2010</b>		<b>\$2.0B</b>		
<b>Plus regional multi-benefits projects</b>			<b>\$0.7B</b>	
<b>Plus other non-network projects</b>			<b>\$1.7B</b>	
<b>Total ATC Capital Expenditures</b>		<b>\$2.2B</b>	<b>\$3.4B</b>	

ATC 2010 10-Year Assessment  
Summary of Asset Renewal Capital Expenditures (2010-2019)  
10-Year Assessment Asset Renewal Project Detail

FP	10-Year Assessment Asset Renewal Project Description	Sum of Future Expenditures 2010-2019
F1444	Rebuild Boscobel-Gran Grae 69-kV line Y-40	\$4,960,988
F1602	Rebuild Dane-Dam Heights 69-kV line Y-8	\$6,482,534
F1656	Rebuild Stage Coach-Spring Green 69-kV line Y-62	\$5,696,054
F1699	Rebuild Plainfield-Chaffee Creek 69-kV line Y-90	\$2,242,359
F1715	Rebuild Forward-Rock Branch 69-kV line Y-135	\$1,177,704
F1732	Rebuild Auburndale-Sigel 69-kV line Y-107	\$602,105
F2024	Replace Ellinwood transformer T2	\$4,289,001
F3007	Improve clearances, install arresters on portions of line, replace select components on Roberts-9 Mile 69-kV line 6952	\$15,560,468
F2340	Replace Council Creek transformer T31	\$2,093,893
F2343	Replace North Fond du Lac transformers T31 and T32	\$2,471,144
F2345	Rebuild Mauston-Hilltop 69-kV line Y-89	\$513,097
F2346	Rebuild Miner-Hillman 69-kV line Y-130	\$1,113,584
F2383	Replace shield wire on Stiles-Pulliam 138-kV lines KK64441-64451	\$4,303,383
F2386	Rebuild Wautoma-Berlin 69-kV line Y-95	\$2,805,243
F2389	Rebuild Pardeeville Tap-North Randolph/Rio 69-kV line Y-64	\$2,130,779
F2410	Rebuild Deer Trail-Whitcomb 69-kV line Y-86	\$3,313,647
F2419	Replace Aurora transformer T3	\$2,140,955
F2604	Replace Bluemound transformer T3	\$4,892,358
F2693	Re-insulate Racine-Kenosha 138-kV line 1651	\$1,084,015
F2697	Re-insulate Racine-Somers 138-kV line 1645	\$0
F2726	Rebuild Kirkwood – Trienda 138-kV line X-52	\$1,257,747
F2765	Re-insulate South Fond du Lac-Edgewater 345-kV line W1	\$708,829
F2786	Re-insulate top phase and add additional arresters on Chandler-Forsyth 69-kV line (Chandler line)	\$1,298,423
F2799	Replace Bluemound transformer T1	\$4,378,990
F2801	Rebuild Sawyer-Dykesville 69-kV line DYKY21	\$11,143,982
F2949	Install "Bird-be-Gone" Dam Heights – Portage 69-kV line Y16	\$61,523
F2985	Re-insulate and improve grounding on Munising-Forsyth 138-kV line (Munising 138 line)	\$3,990,716
F2986	Reinsulate, add arresters, replace select poles on Munising-Gwinn 69-kV line (Autrain line)	\$2,277,477
F2994	Install anti-galloping and grounding improvements on Columbia-South Fond Du Lac 345-kV line W5	\$768,773
F2995	Replace underground cable on East Towne-Sycamore 69-kV line 6987	\$5,278,606
F2999	Re-insulate Harrison-Iola 69-kV line Y56 CWEC Iola Tap	\$163,361
F3020	Install "Bird-Be-Gone" Crivitz – Pioneer 69-kV line E-83	\$67,405
<b>2009 TYA Asset Renewal Projects Reported</b>		<b>\$99.3M</b>
<b>Plus other Asset Renewal projects (includes Protection)</b>		<b>\$632.7M</b>
<b>Total 10-Year Asset Renewal Capital Expenditures</b>		<b>\$732M</b>