October 2009 10-Year Assessment
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Zones & Study Results

Introduction

For system planning purposes, we have defined five planning zones representing distinct geographic areas within our overall service territory. Within each zone, we compile and assess the transmission system needs. This zone-level planning is one of four levels at which transmission system needs are assessed and potential solutions developed. ATC's five planning zones are shown in Figure ZS-21.

In March 2008, Federal Energy Regulatory Commission (FERC) Order 890-A took effect. As part of this order, FERC requires a coordinated, open, and transparent transmission planning process on both a local and regional level. To comply with these requirements, ATC submitted a compliance filing on Order 890-A that provides a timeline of actions to ensure that the economic planning process is both coordinated and open.

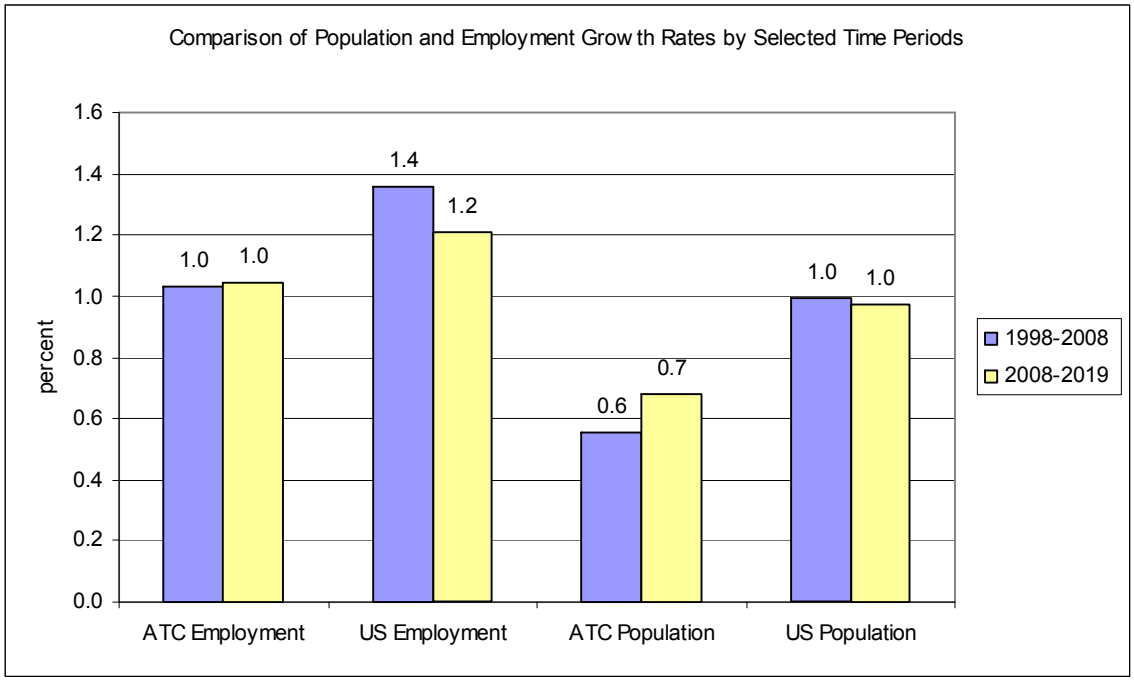
For each zone, we have compiled recent information on:

- ❑ demographics,
- ❑ future population and employment projections,
- ❑ environmental considerations,
- ❑ electricity demand and generation,
- ❑ transmission system issues,
- ❑ 2010 study results,
- ❑ 2014 study results,
- ❑ 2019 study results, including 20% Wind and Slow Growth Futures and
- ❑ 2024 study results.

Demographics – Long-term overview

For the 10-year period 1998 to 2008, population and employment for the American Transmission Company (ATC) service area, which owns approximately 80 percent of the transmission lines in the state of Wisconsin, has grown steadily, but not as fast as both employment and population for the United States. The population of the service area grew at an annual rate of 0.6 percent, while the United States increased 1.0 percent over that same period. The annual employment growth rate was 1.0 percent, while again the United States grew faster at 1.4 percent.

Population in the ATC service area is projected to grow at 0.7 percent annually between 2008 and 2019, while the United States is projected to grow 1.0 percent. Employment in the ATC service area for the same period is projected to grow at 1.0 percent annually, while the growth in employment for the United States is projected to increase slightly faster (1.2 percent).



Within the ATC service area over the historical period, the highest annual growth rate for both population (1.0 percent) and employment (1.6 percent) occurred in the ATC Zone 3, which is defined as South Central/Southwest Wisconsin and North Central Illinois (Please refer to Zone 3 study results for a list of counties).

The Zone 3 historical annual growth rates are in line with the Rest-of-Wisconsin and the United States growth rates for population and employment. In addition, Zone 3 over the 2008-2019 period is projected to have the highest growth rates for both population and employment and again are in line with the Rest-of-Wisconsin and the United States projected growth rates.

Population Growth Rates				
	1998-2008	2008-2014	2014-2019	2008-2019
Zone 1	0.3	0.6	0.7	0.7
Zone 2	-0.1	0.2	0.2	0.2
Zone 3	1.0	1.1	1.0	1.0
Zone 4	0.6	0.7	0.7	0.7
Zone 5	0.5	0.5	0.5	0.5
ATC Total	**0.6**	**0.7**	**0.7**	**0.7**
Rest of MI	0.3	0.3	0.4	0.4
Rest of WI	0.8	1.0	1.0	1.0
Michigan	0.3	0.3	0.4	0.4
Wisconsin	0.6	0.7	0.8	0.8
United States	1.0	1.0	1.0	1.0

Employment Growth Rates				
	1998-2008	2008-2014	2014-2019	2008-2019
Zone 1	1.0	1.0	1.0	1.0
Zone 2	0.6	0.8	0.8	0.8
Zone 3	1.6	1.3	1.4	1.4
Zone 4	1.2	1.0	1.0	1.0
Zone 5	0.6	0.9	0.9	0.9
ATC Total	**1.0**	**1.0**	**1.0**	**1.0**
Rest of MI	0.4	0.9	0.9	0.9
Rest of WI	1.5	1.2	1.2	1.2
Michigan	0.4	0.9	0.9	0.9
Wisconsin	1.1	1.1	1.1	1.1
United States	1.4	1.2	1.2	1.2

While the growth in population and employment has been steady, annual growth rates have been historically slower than both the growth in the Rest of Wisconsin as well as the United States. This trend is projected to continue for the period 2008 to 2019.

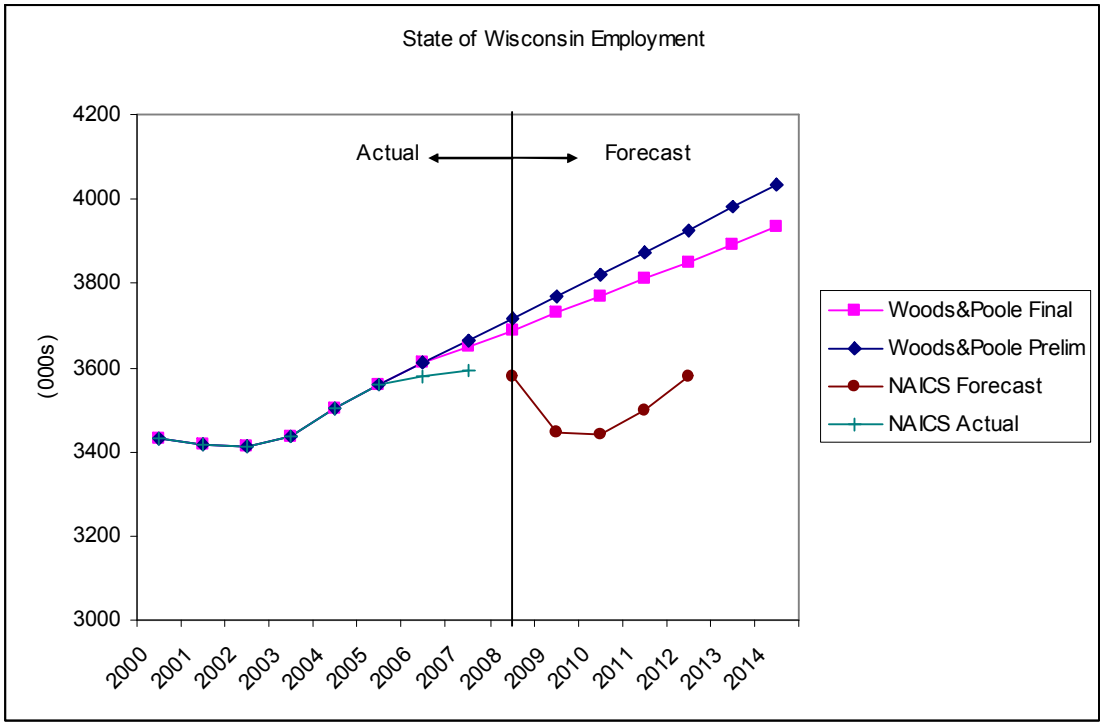
Population (000s)				
	1998	2008	2014	2019
Zone 1	503.1	519.4	539.7	557.8
Zone 2	335.2	330.6	334.4	338.2
Zone 3	1,080.9	1,190.6	1,268.1	1,335.3
Zone 4	1,034.4	1,098.9	1,142.9	1,181.8
Zone 5	1,825.0	1,912.0	1,972.9	2,027.7
ATC Total	**4,778.7**	**5,051.4**	**5,258.0**	**5,440.8**
Rest of MI	9,548.3	9,809.1	10,013.3	10,204.2
Rest of WI	818.7	885.3	939.7	986.9
Michigan	9,847.9	10,102.9	10,309.5	10,503.0
Wisconsin	5,297.7	5,643.0	5,901.6	6,128.9
United States	275,854.1	304,579.4	322,897.0	338,796.2

Employment (000s)				
	1998	2008	2014	2019
Zone 1	296.8	328.9	348.1	365.2
Zone 2	167.5	178.0	187.1	195.1
Zone 3	711.8	833.6	903.2	966.2
Zone 4	654.4	739.4	784.4	824.3
Zone 5	1,143.9	1,216.3	1,284.6	1,344.0
ATC Total	**2,974.4**	**3,296.3**	**3,507.4**	**3,694.7**
Rest of MI	5,266.2	5,485.2	5,797.7	6,070.8
Rest of WI	477.9	552.5	593.5	629.9
Michigan	5,415.6	5,644.9	5,965.6	6,245.8
Wisconsin	3,303.0	3,689.1	3,933.0	4,149.5
United States	159,628.1	182,657.7	196,274.3	208,393.4

Demographics – Short-term overview
"The national economy has been in recession for 15 months now, starting in December 2007 as dated by the National Bureau of Economic Research. Current trends of key indicators of the Wisconsin economy show that Wisconsin is also in a recession, with the same start date of

December 2007."[1] The current recession in Wisconsin has had short-term economic impacts on the growth in employment in our service area.

As the graph below illustrates, Wisconsin employment has dramatically declined relative to the long-term trend in employment. "Getting back" to the long-term trend will require several years of strong economic growth; as a result, the estimates of future growth in both employment and population should be viewed as "upper bound" estimates.



Sources: *Woods & Poole Prelim - Woods & Poole 2008 State Profile (May 2008 release)*
Woods & Poole Final - Woods & Poole 2008 State Profile (October 2008 release)
NAICS Actual - Bureau of Economic Analysis Regional Economic Accounts Table SA25N
NAICS Forecast - Wisconsin Economic Outlook March 2009 page 35

About the study results
For each zone, system performance criteria limits that are exceeded (overloads, low voltages, etc.) are identified from the results of each base model and associated contingency models along with their causes. In addition, system constraints (known transmission service/import limiters) also are identified. The identified needs and exceeded limits are categorized by ATC planning zone. Tables ZS-1 through ZS-4 list the combined limitations and instances where performance criteria limits are exceeded that were identified in the 2010, 2014, 2019 and 2024 analyses. The same information is

[1] Wisconsin Economic Outlook Executive Summary, March 2009, page 1.

shown graphically in Figures ZS-1 through ZS-20. Table ZS-3a lists information compiled from our 2019 20% Wind and Slow Growth futures power flow contingency analyses.

Note: The results for each zone in many cases are similar to the results presented in our Update of the 2008 10-Year Assessment issued in October 2008. Where new results or changes have been found, the new information is identified as such.

Beginning in April, 2005, the Midwest Independent System Operator began to monitor market constraints in both the Real Time and the Day Ahead markets. These market constraints may be lines, transformers or other equipment whose ratings would be exceeded when generation is dispatched in the most economic manner possible. These constraints are taken into consideration when developing solutions to the limits and needs identified above.

A summary of the top 20 constraints that occurred in the Day Ahead and the Real Time markets on the ATC system during the past year of market operation is provided in Tables ZS-5 and ZS-6, respectively. ATC uses the market shadow price of transmission constraints (the amount generating costs could be reduced if the transmission constraint were relieved by one megawatt) as the screening indicator to rank the severity of transmission constraints. From a planning perspective, we are concerned about market constraints that that are more severe as these constraints hinder the delivery of economic energy and drive locational marginal pricing (LMP).

In the LMP market, potential transmission equipment overloads are identified as constraints and are "bound" by the market in order to alleviate high loading levels. The binding of constraints results in a market-based redispatch of generation that is less than ideal from an economic standpoint.

Constraints that occur in the Day Ahead and Real Time markets facilitate the ability to recognize where our system may require reinforcements. The Day Ahead limitations, found in Table ZS-5, are anticipated on the system when the Day Ahead generation offers and load bids are settled. The Day Ahead market constraints can be the result of virtual transactions and are the basis of the Financial Transmission Rights (FTR) market. The Real Time limitations, found in Table ZS-6 are the result of unforeseen system conditions, which can result from load variation, unplanned outages, or market bids and offers that are not submitted in the Day Ahead. The Day Ahead and Real Time market constraints are taken into account when developing solutions. These constraints may point out potential problems but must be investigated further in order to determine if there are cost-effective solutions to mitigate the constraints in the future.

The primary (currently preferred) solution and the alternative solutions to the system performance criteria limits exceeded in the analyses are described for each zone. For limits exceeded in the 2010 model where the limit must be resolved in the near term and the preferred solution or a potential solution can reasonably be expected to be completed by 2014, such solutions are included in the 2014 model. For criteria limits exceeded in the 2010 analysis where the preferred or potential solutions require further verification or more analysis, such solutions are not included in the 2014 model, but the need is further investigated in the 2014 analysis. In instances where the need is further verified by the 2014 analyses, primary and alternative solutions are listed as part of the plan, with in-service dates based on reasonably likely completion dates. The same type of analyses was conducted for 2019 and 2024, with planned and several proposed projects being

included in the 2019 and 2024 models. This linking of results across the four study years allows us to begin to optimize the solutions to problems within a zone and also within the entire ATC system. As a result, the specific discussion of results for each study year will sometimes include discussion of issues identified in a future study year because of the need to utilize an optimized solution in the earlier study year.

The solutions ultimately selected to address the needs and limitations identified will reflect the input of transmission planning process stakeholders, including customers, state and local officials, the public, and coordination with other planning processes to the extent possible. Please refer to Methodology & assumptions for a better understanding of the basis for the results discussed by zone.

We continue to focus more attention on dealing with unexpected conditions. For instance, it is important to have appropriate reactive power reserves to manage system conditions that differ from the norm. While many capacitor bank installations are proposed in each zone to meet specific system needs, it should be noted that these additions also increase our flexibility to deal with extreme system conditions. See the reactive power analysis and multiple outage studies discussions for more information about the ability of the ATC system to manage unexpected conditions.

In the multiple outage studies section, we summarize the status of the studies that we have been conducting. This includes a summary of stability analyses reviewed or recently completed, providing insights into current stability margins of major generating stations on our system.