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Economic planning

ATC utilizes three methods to determine which projects have the potential for economic benefits:

1. Stakeholder Input and Analyses
2. Reliability Project Screening
3. Congestion Severity Index

These methods are described below.

Stakeholder Input and Analyses

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. ATC has also submitted a compliance filing on Order 1000 that incorporates public policy requirement needs into its economic planning analysis

Annually, ATC will use a process with consistent timelines that combines stakeholder input, historical data, future line flow forecasts, and updated information on the electric system to identify transmission upgrades for economic evaluation.

Each year:

- During February, we hold an initial stakeholder meeting to review the market congestion summary and potential fixes and to discuss economic study scenarios, drivers, ranges, and assumptions.
- By March 1, we work with stakeholders to request and prioritize new/other economic studies and recommend study assumptions.
- By April 15 – we identify preliminary areas of economic study, study assumptions and models and solicit further comments from stakeholders, including soliciting stakeholders for public policy requirements that drive transmission needs.
- By May 15 – we finalize areas of economic study, study assumptions and models to be used in analysis, including a determination as to why or why not public policy requirements were included in the assumptions.
- By November 15 – we provide a summary of the results of the economic analyses to our stakeholders.

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ATC conducts analyses of the projects identified for study over several months' time and posts the key results, including the extent to which these savings offset project costs. When the expected benefits of a studied project are high enough to justify its costs, the process of developing it as a formal proposal is begun.

As a result of the 2013 ATC/stakeholder collaborative process, we are performing economic analyses on the following ATC facilities:

Economic Planning Study Areas

- Marquette – Mackinac 138 kV Project
- Butler - Bluemound 138 kV Project

Studies will be performed and results shared with stakeholders over the course of the year. In addition, customers and stakeholders who would like to request specific economic studies can do so if they are willing to pay for the studies and are willing to have the results posted publicly.

Reliability Project Screening

Economic analyses were performed on 23 projects from the 2012 10-Year Assessment project list to determine whether those projects were candidates for acceleration or deferral based on economic considerations. Please refer Table EP-1 for the list of projects screened. The list of 23 projects was based primarily on the availability of redispatch and capital costs of the projects; however, lower cost projects specifically identified by the ATC planning department were also included in the study. Generation interconnection and distribution interconnection projects were not eligible for inclusion in this list. Further, capacitor bank projects were not considered since the voltage benefits provided were not captured by the PROMOD software analysis. Finally, projects with in-service dates prior to 2015 were not considered since development of those projects was too far underway to make scheduling changes. As a result of this screening, two projects showed significant savings that offset costs. One project, the Arnold 2nd transformer showed significant savings, but could not be accelerated due to construction timelines. The other project that showed significant savings was the Wautoma 2nd transformer and will be studied further.

A similar analysis will be performed in the 2014 10-Year Assessment based upon the 2013 Assessment project list.

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Table EP-1
List of 10-Year Assessment 2012 Economically Screened Projects

#	TYA Economic Studied Projects	Planning Zone
1	Caroline 115/69 kV Transformer replacement	1
2	Fairwater - Mackford Prairie 69 KV project	1
3	Harrison 138/69 kV Transformer replacement	1
4	Metomen 138/69 kV Transformer replacement	1
5	Petenwell 138/69 kV Transformer replacement	1
6	Wautoma 138/69 kV 2nd Transformer	1
7	Arnold 345/138 kV Transformer	2
8	Morgan - Plains - National 345 kV	2 & 4
9	Morgan - Plains 345 kV	2 & 4
10	Cardinal - Blount 138 kV	3
11	Colley Road - Brick Church 69 kV rebuild	3
12	Hillman 138/69 kV 2nd Transformer	3
13	Hubbard - East Beaver Dam 138 kV	3
14	Lake Delton - Birchwood 138 kV	3
15	Portage - Columbia 138 kV rebuilds	3
16	Spring Green 138/69 kV 2nd Transformer	3
17	West Middleton - Pheasant Branch 69 kV rebuild	3
18	Bain - Spring Valley - North Lake Geneva 138 kV project	3 & 5
19	Fitzgerald 2nd 345/138 kV Transformer	4
20	Pulliam - Glory Rd 138 kV project	4
21	Shoto - Custer 138 kV	4
22	Sunset Point 138/69 kV Transformers replacement	4
23	Arcadian - Waukesha 138 kV rebuilds	5

Congestion Severity Index

ATC developed a Congestion Severity Index for use as the screening indicator to track locations on the transmission system where constraints to the delivery of economic energy exist. The Congestion Severity Index combines the financial impact of constraints with the frequency of constraints. The financial impact during an hour is the calculated theoretical maximum number of dollars that could be paid into the market due to congestion on the constraint in question. The sum of the total financial impacts for each hour during which the constraint occurs forms the basis of the Congestion Severity Index. This information is used as a starting point in determining areas of the system where potential upgrades may be cost-effective. This data is combined with stakeholder input and ATC planning recommendations to identify a group of projects to study. A list of the most severe market constraints in the Day Ahead and Real Time markets for 2012 is given in Tables ZS-5 and ZS-6, respectively. Maps depicting the geographic locations of the most severe market constraints in the Day Ahead and Real Time markets for 2012 are shown in Figures ZS-27 and ZS-28, respectively.

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Table ZS-5

ATC Day Ahead Market Most Limiting Elements – 2012

Severity Index	Hours	Day Ahead Element	Potential Solution(s)
15.31	877	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Council Creek 161 kV line (Planned 2014) Badger - Coulee 345 kV line (Proposed 2018)
7.13	851	Kenosha - Lakeview 138 kV	SE Wisconsin SPS (In Service July 2012) Pleasant Prairie - Zion Energy Center 345 kV line (Planned 2013) Kenosha - Lakeview 138 kV rebuild (Planned 2014)
6.10	223	Granville - Tosa 138 kV	Terminal Equipment Replacement at Tosa Substation (In Service May 2012) Granville - Tamarack - Butler reconfigure (Planned 2015)
5.83	1,841	Flow South PTDF	Power Flow Control in UP (Planned 2014) Hiawatha - Indian Lake 138 kV energize (Planned 2014) Bay Lake Project: Holmes - Old Mead Road 138 kV line (Proposed 2016) Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017) Morgan - Plains - National 345 kV line currently being studied in Northern Area Study
3.90	453	Butler - Granville 138 kV	Terminal Equipment Replacement at Butler Substation (In Service April 2012) Granville - Tamarack - Butler reconfigure (Planned 2015)
3.74	147	North Appleton - Werner West 345 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017)
2.79	181	Cypress - Forest Junction 345 kV	ATC is currently investigating solutions
2.78	291	Elkhart Lake - Forest Junction 138 kV	ATC is currently investigating solutions
1.65	294	Morgan - White Clay 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017)
1.61	427	Felch Mountain Tap - Nordic 69 kV	Arnold 345/138 kV Transformer (Planned 2015) Bay Lake Project: Holmes - Old Mead Road 138 kV line (Proposed 2016)
1.37	51	Forest Junction 345/138 kV Transformer T1	ATC is currently investigating solutions
1.35	465	Goodman - Masonville 69 kV	Chandler - Old Mead Road 138 & 69 kV lines (Proposed 2014)
1.28	79	Albers - Kenosha 138 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Planned 2013) Albers - Kenosha 138 kV rebuild (Planned 2014)
1.27	232	Pulliam - Stiles 138 kV (64451)	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017)
1.08	65	Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Planned 2013)
71.02	**10,935**	**Total for All ATC Day Ahead Constraints in 2012**	

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Figure ZS-27
ATC Day Ahead Market Top 15 Most Limiting Elements - 2012

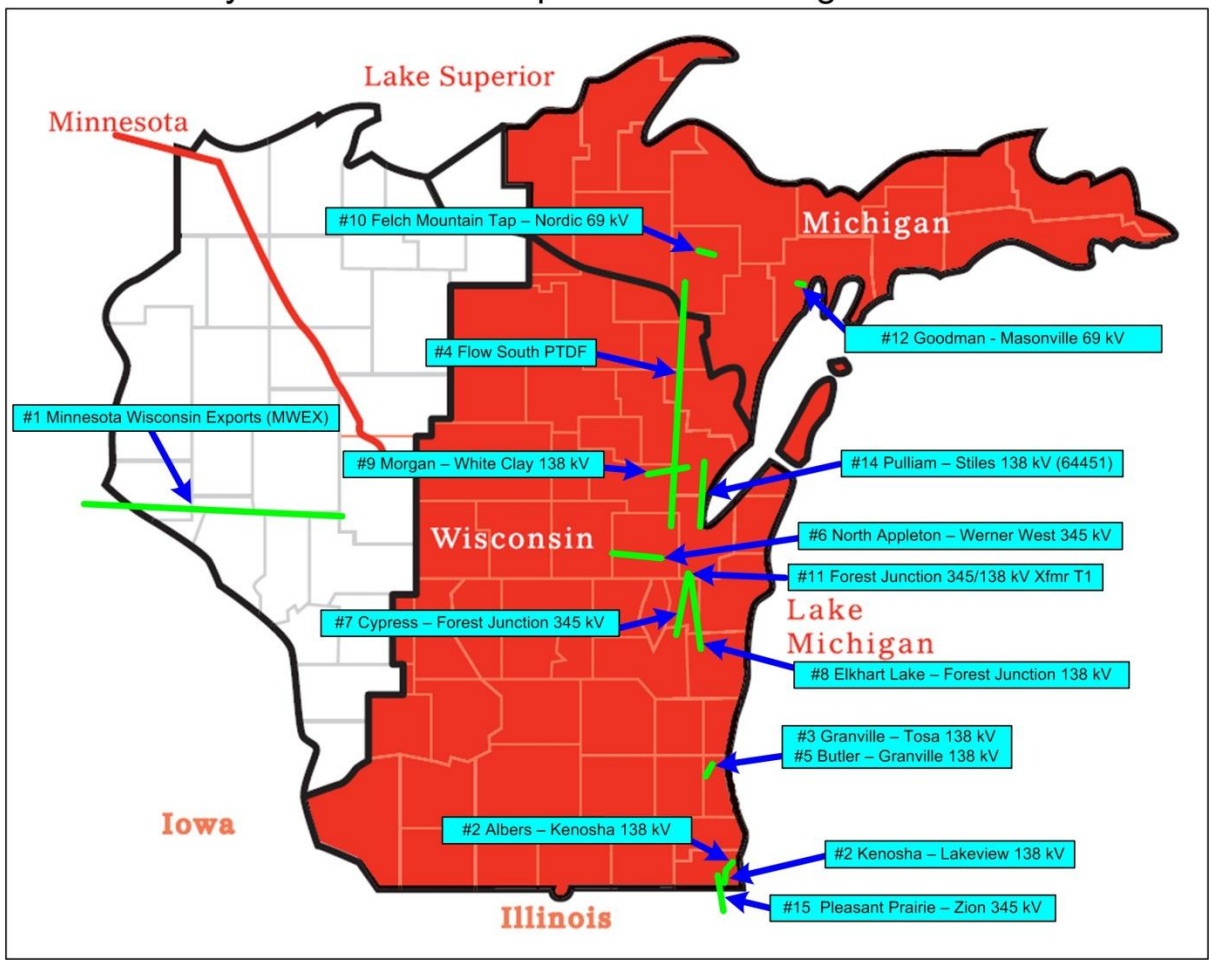

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Table ZS-6

ATC Real Time Market Most Limiting Elements – 2012

Severity Index	Hours	Real Time Element	Potential Solution(s)
13.29	47.1	North Appleton - Werner West 345 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017)
3.86	130.5	Kenosha - Lakeview 138 kV	SE Wisconsin SPS (In Service July 2012) Pleasant Prairie - Zion Energy Center 345 kV line (Planned 2013) Kenosha - Lakeview 138 kV rebuild (Planned 2014)
2.75	93.3	Cypress - Forest Junction 345 kV	ATC is currently investigating solutions
2.36	12.8	Flow South PTDF	Power Flow Control in UP (Planned 2014) Hiawatha - Indian Lake 138 kV energize (Planned 2014) Bay Lake Project: Holmes - Old Mead Road 138 kV line (Proposed 2016) Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017) Morgan - Plains - National 345 kV line currently being studied in Northern Area Study
2.35	61.7	Arcadian - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Planned 2013)
2.26	55.5	Goodman - Masonville 69 kV	Chandler - Old Mead Road 138 & 69 kV lines (Proposed 2014)
2.16	8.4	Lost Dauphin - North Appleton 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017)
2.12	5.7	North Appleton 345/138 kV Transformer T1	Transmission status may have contributed to this constraint
2.06	39.3	Morgan - White Clay 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2017)
2.03	73.0	Felch Mountain Tap - Nordic 69 kV	Arnold 345/138 kV Transformer (Planned 2015) Bay Lake Project: Holmes - Old Mead Road 138 kV line (Proposed 2016)
2.00	24.5	Elkhart Lake - Forest Junction 138 kV	ATC is currently investigating solutions
1.85	19.9	Presque Isle - Tilden 138 kV	Morgan - Plains - National 345 kV line currently being studied in Northern Area Study National area 138 kV upgrades currently being studied in Northern Area Study
1.50	6.2	Coyne - Rocky Run 115 kV	ATC is currently investigating solutions
1.10	52.6	Butler - Granville 138 kV	Terminal Equipment Replacement at Butler Substation (In Service April 2012) Granville - Tamarack - Butler reconfigure (Planned 2015)
1.09	40.9	Granville - Tosa 138 kV	Terminal Equipment Replacement at Tosa Substation (In Service May 2012) Granville - Tamarack - Butler reconfigure (Planned 2015)
54.80	**1,161.2**	**Total for All ATC Real Time Constraints in 2012**	

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Figure ZS-28
ATC Real Time Market Top 15 Most Limiting Elements - 2012