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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 2014 ATC/stakeholder collaborative process, we are performing economic analyses on the following ATC facilities:

Economic Planning Study Areas

- Janesville 138 kV Project
- Point Beach 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 11 projects from the 2013 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 11 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 2016 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 promise. Both the Shoto-Custer 138 kV line and the Spring Green 2nd transformer both had savings that helped offset costs, but could not cover them completely. They will continue to be studied further for acceleration.

A similar analysis will be performed in the 2015 10-Year Assessment based upon the 2014 Assessment project list.

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Table EP-1
List of 10-Year Assessment 2013 Economically Screened Projects

#	2013 TYA Economic Studied Projects	Planning Zone
1	Presque Isle - Tilden 138 kV line loop into National and uprate National - Tilden 138 kV line	2
2	Victoria - Winona 69 kV line construction	2
3	Winona - Atlantic 69-kV line rebuild	2
4	Spring Green 2nd 138/69 kV Transformer	3
5	Cardinal-Blount 138-kV line	3
6	West Middleton- Pheasant Branch 69 kV double circuit	3
7	Bass Creek - Townline Road reconductor	3
8	Portage - Trienda 138 kV uprate	3
9	Shoto-Custer 138kV line	4
10	Arcadian-Waukesha 138-kV lines rebuild	5
11	Arcadian 345/138 kV Transformer replacement	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 2013 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 2013 are shown in Figures ZS-27 and ZS-28, respectively.

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Table ZS-5

ATC Day Ahead Market Most Limiting Elements – 2013

Severity Index	Hours	Day Ahead Element	Potential Solution(s)
14.01	713	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Council Creek 161 kV line (Planned 2015) Badger - Coulee 345 kV line (Proposed 2018)
5.93	427	Albers - Kenosha 138 kV	Albers - Kenosha 138 kV rebuild (Planned 2014)
4.69	158	Columbia - Portage 138 kV (X-20)	ATC is currently investigating solutions Badger - Coulee 345 kV line (Proposed 2018) Cardinal - Bluffs 345 kV (Proposed 2020) Columbia - Portage 138 kV rebuilds (Provisional 2025)
4.52	239	North Appleton 345/138 kV Transformer T3	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019)
2.92	251	Paddock - Town Line Rd 138 kV	Paddock - Town Line Rd 138 kV rebuild (Asset Renewal 2014) Transmission status may have contributed to this constraint
2.65	104	Forest Junction - Lake Park 138 kV	Transmission status may have contributed to this constraint
2.58	159	Forest Junction - Kaukauna Central 138 kV	Transmission status may have contributed to this constraint
1.94	180	Pleasant Prairie - Zion 345 kV	ATC is currently investigating solutions Pleasant Prairie - Zion Energy Center 345 kV line (In-service 2013)
1.92	250	Arcadian - Zion 345 kV	ATC is currently investigating solutions Pleasant Prairie - Zion Energy Center 345 kV line (In-service 2013)
1.84	135	Ellington - Hintz 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019)
1.69	44	Arcadian - Waukesha 138 kV (9962)	Arcadian - Waukesha 138 kV lines 9942 and 9962 rebuild (Proposed 2019)
1.56	512	Pulliam - Stiles 138 kV (64441)	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019)
1.44	91	Bluemound 230/138 kV Transformer T2	Transmission status may have contributed to this constraint
1.38	317	Falls - Morgan 138 kV	Bay Lake Project: Morgan - Stiles 138 kV double circuit (Proposed 2019)
1.07	235	Pleasant Prairie 345/24 kV Transformer T2	Pleasant Prairie Bus Reconfiguration (In-service 2013) Transmission status may have contributed to this constraint (Stability Limit)
66.90	**8,536**	**Total for All ATC Day Ahead Constraints in 2013**	

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Figure ZS-27

ATC Day Ahead Market Most Limiting Elements – 2013 Map

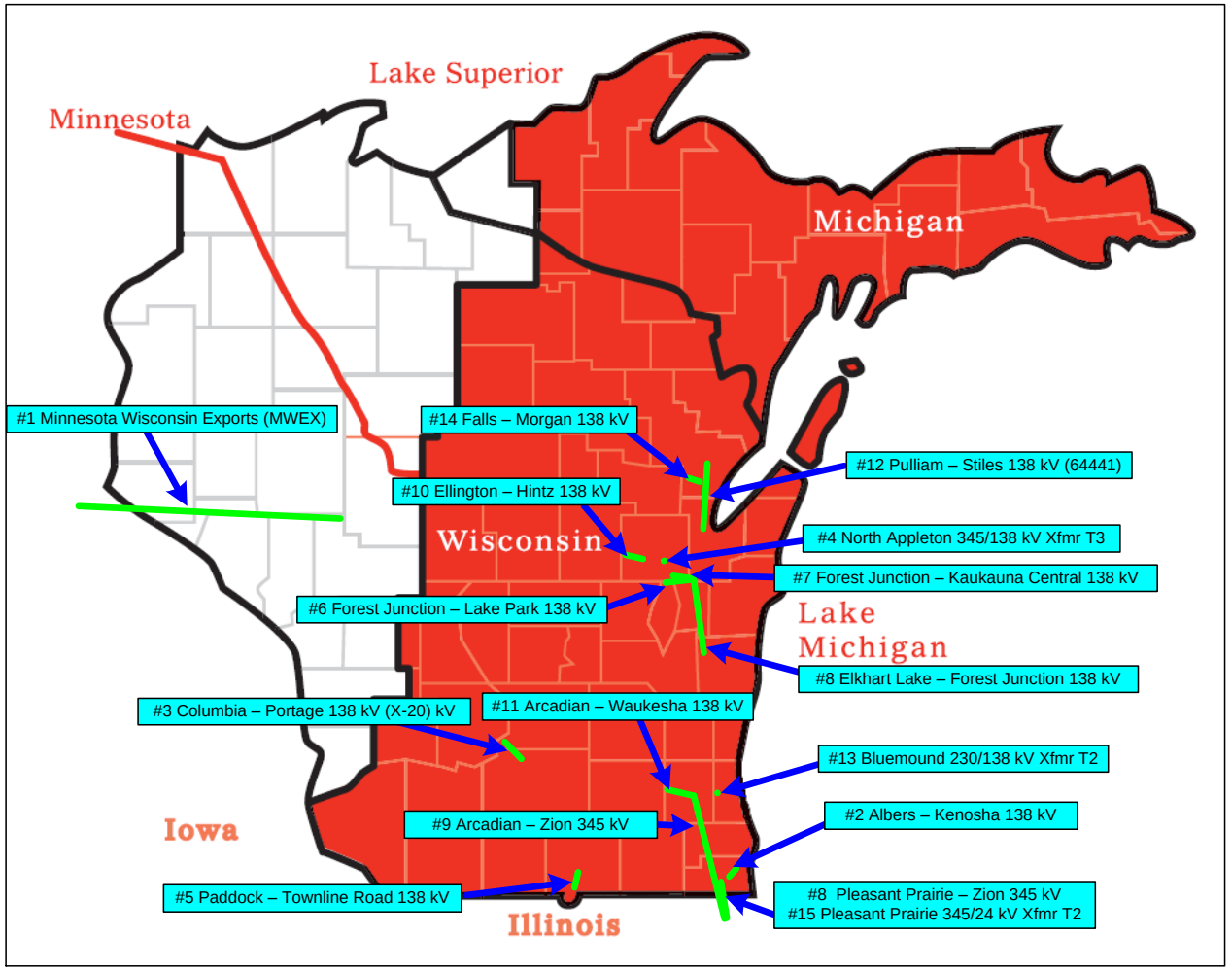

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Table ZS-6

ATC Real Time Market Most Limiting Elements – 2013

Severity Index	Hours	Real Time Element	Potential Solution(s)
5.39	43.4	Columbia - Portage 138 kV (X-20)	ATC is currently investigating solutions Badger - Coulee 345 kV line (Proposed 2018) Cardinal - Bluffs 345 kV (Proposed 2020) Columbia - Portage 138 kV rebuilds (Provisional 2025)
3.70	4.7	Forest Junction - Point Beach 345 kV	Transmission status may have contributed to this constraint
3.67	106.0	Albers - Kenosha 138 kV	Albers - Kenosha 138 kV rebuild (Planned 2014)
3.26	23.1	Paddock - Town Line Rd 138 kV	Paddock - Town Line Rd 138 kV rebuild (Asset Renewal 2014) Transmission status may have contributed to this constraint
3.20	42.0	North Appleton 345/138 kV Transformer T3	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019)
2.56	33.0	Ellington - Hintz 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019)
2.55	63.3	Arcadian - Zion 345 kV	ATC is currently investigating solutions Pleasant Prairie - Zion Energy Center 345 kV line (In-service 2013)
2.16	102.9	Tecumseh 138/69 kV Transformer T1	Transmission status may have contributed to this constraint
1.94	35.5	Falls - Morgan 138 kV	Bay Lake Project: Morgan - Stiles 138 kV double circuit (Proposed 2019)
1.91	49.0	Pleasant Prairie - Zion 345 kV	ATC is currently investigating solutions Pleasant Prairie - Zion Energy Center 345 kV line (In-service 2013)
1.85	31.3	Pulliam - Stiles 138 kV (64441)	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019)
1.40	34.2	Paddock - Shirland Ave 69 kV	Paddock - Shaw 69 kV rebuild (Planned 2014) Transmission status may have contributed to this constraint
1.31	12.3	Forest Junction - Kaukauna Central 138 kV	Transmission status may have contributed to this constraint
1.07	2.5	Flow South PTDF	Power Flow Control in UP (Planned 2014) Bay Lake Project: Holmes - Old Mead Road 138 kV line (Planned 2016) Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019) ATC is currently investigating solutions
1.06	28.9	Granville 345/138 kV Transformer T3	Transmission status may have contributed to this constraint
53.31	**1,115.6**	**Total for All ATC Real Time Constraints in 2013**	

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Figure ZS-28

ATC Real Time Market Most Limiting Elements – 2013 Map