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2012 Economic Planning Study Results

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ATC Economic Planning
February 26, 2013

Introduction

- Economic Planning Analysis Metrics
  - Customer Benefit Metric
  - Loss Evaluation
- Project Review
  - Saratoga – Petenwell 138 kV
  - Milwaukee Area 138 kV
- Project Analysis and Results

PROMOD Energy Benefits Description

- PROMOD used to analyze 2022 study year
- Difference analysis performed to determine project savings
- All Futures analyzed using ATC Customer Benefit (CB) Metric:

Settlements Format for CB Metric

Load Pays local Locational Marginal Price (LMP)
- Generator Revenues Received at local Gen LMP
+ Cost of Utility Generation (Production Cost)
- FTR Revenue to the Utility
- Loss Refund Revenues for over-collection
= Impact to Ratepayers

Customer Benefit Metric Components

Customer Benefit Metric Components:

- Net Production Cost excluding IPPs within ATC
- IPP Purchase Cost to Utilities
- Import Cost
- Export Revenue
- Congestion Cost
- Revenue from Existing External FTRs
- ATC Internal FTR Value
- Marginal Loss Cost
- Loss Refund on Internal Transactions and Imports
- “Credit” for Losses Already Captured in Production Cost
- Cost of Load Changes due to Losses
- Cost due to CO_2 Emissions (CO_2 Tax)

Loss Savings Description

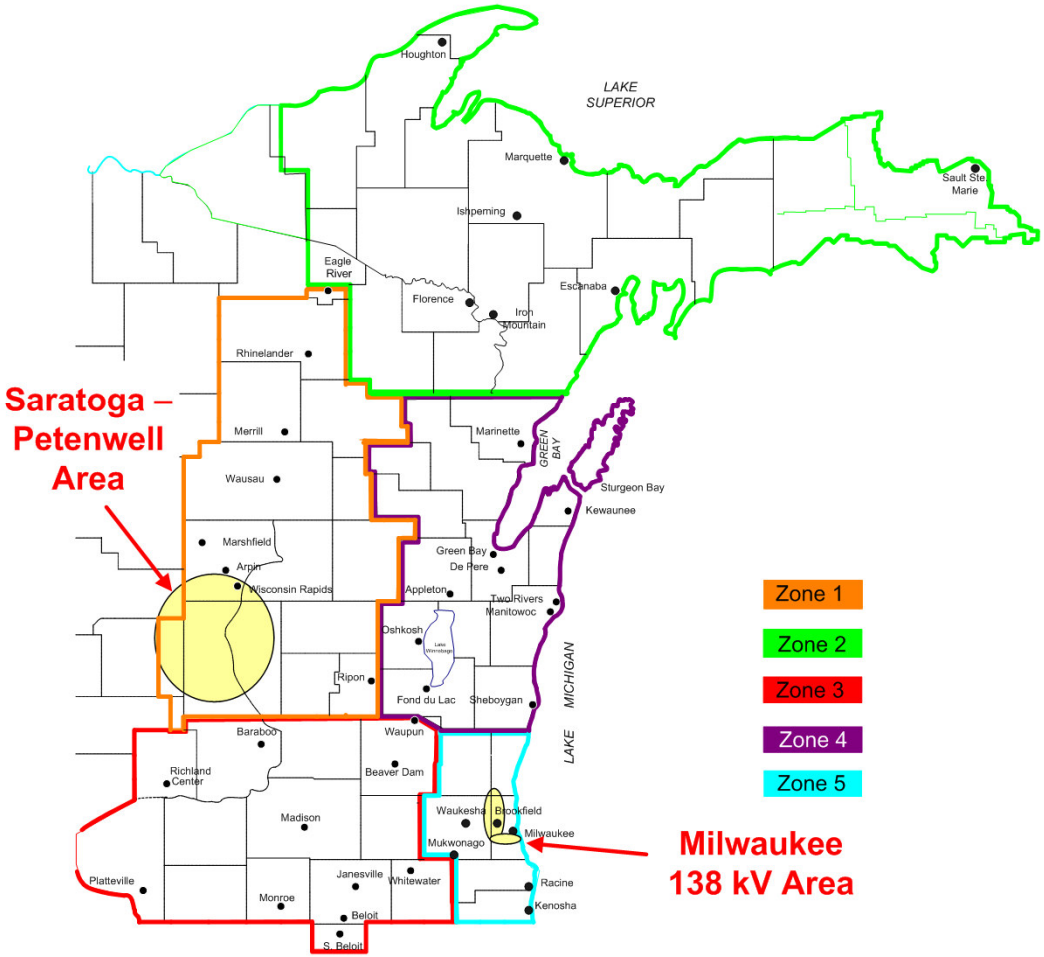
- Loss evaluation is an important component of economic project analysis
- PROMOD difference analysis performed to determine system loss savings ($)
  - Loss savings (MWHrs) calculated from PROMOD
  - Economic value of loss savings determined by pricing losses (MWHrs) at PROMOD area LMPs ($/MWHrs)

ATC 2022 – Analysis Results

- Single-Year PROMOD Savings
  - Shown in Millions of Dollars for 2022 ($M – 2022)
  - Savings based on difference analysis using Customer Benefit Metric
- 40-Year PROMOD Savings
  - Shown in Millions of Dollars for 2012 ($M – 2012)
  - Savings based on difference analysis using Customer Benefit Metric
  - Calculations based on:
    - Assumed 40-Year Economic Life of Project
    - 3.0% Inflation Rate
    - 6.7% Nominal Discount Rate

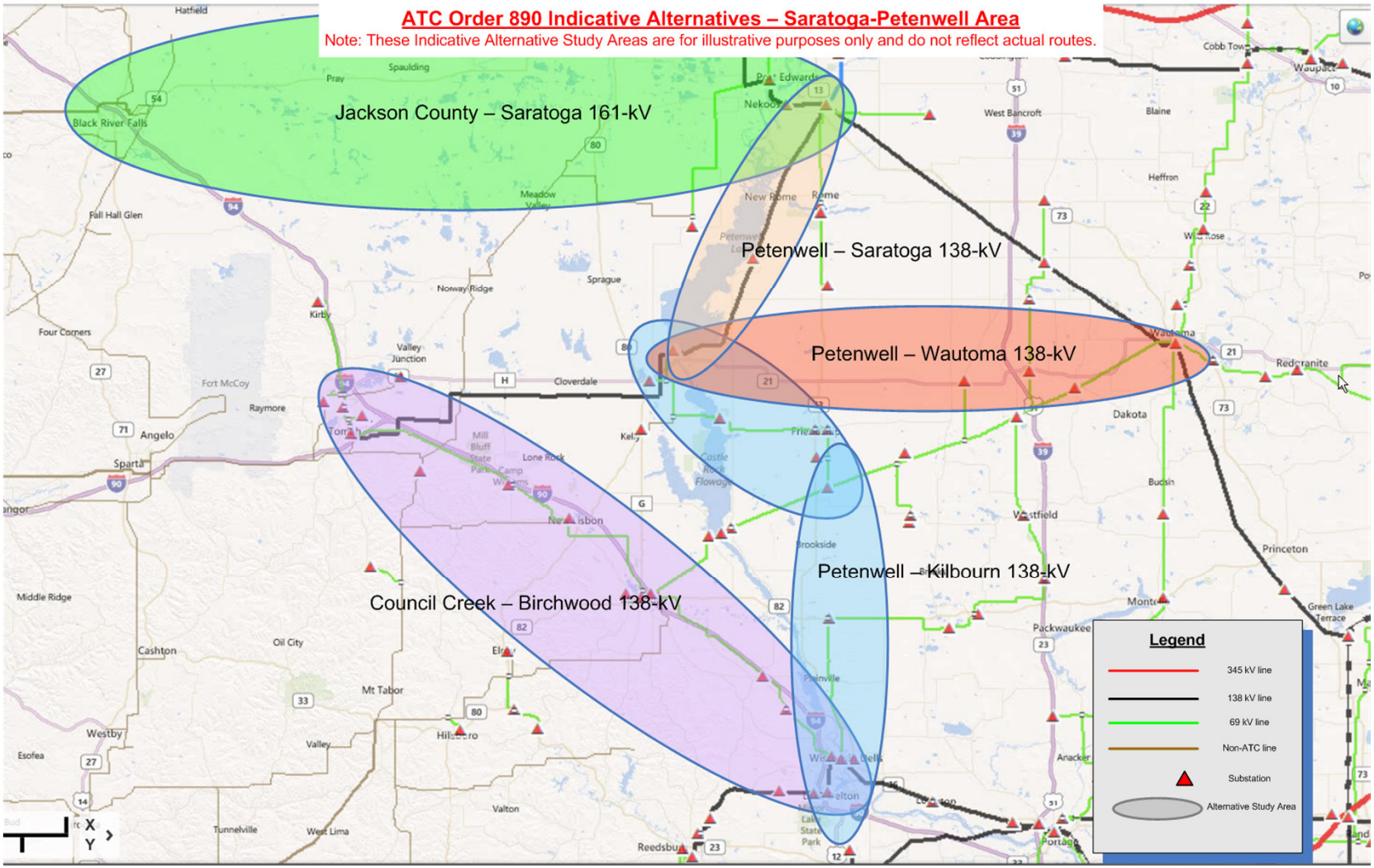
ATC 2012 Order 890 Economic Analysis – Projects Areas Being Studied

Constrained Area	Analysis Details
Saratoga - Petenwell 138 kV	2012 Order 890 Study Area
Granville - Butler - Bluemount - St. Martins - Oak Creek 138 kV	2012 Order 890 Study Area



Project Review – Petenwell-Saratoga Area

- Petenwell – Saratoga 138 kV
  - Uprate existing 138 kV line
  - Council Creek – Birchwood 138 kV line
  - Jackson County – Saratoga 161 kV line
  - Petenwell – Kilbourn 138 kV line
  - Petenwell – Wautoma 138 kV line


ATC Order 890 Indicative Alternatives – Saratoga-Petenwell Area
Note: These Indicative Alternative Study Areas are for illustrative purposes only and do not reflect actual routes.
Jackson County – Saratoga 161-kV
Petenwell – Saratoga 138-kV
Petenwell – Wautoma 138-kV
Petenwell – Kilbourn 138-kV
Council Creek – Birchwood 138-kV
Legend
345 kV line
138 kV line
69 kV line
Non-ATC line
Substation
Alternative Study Area

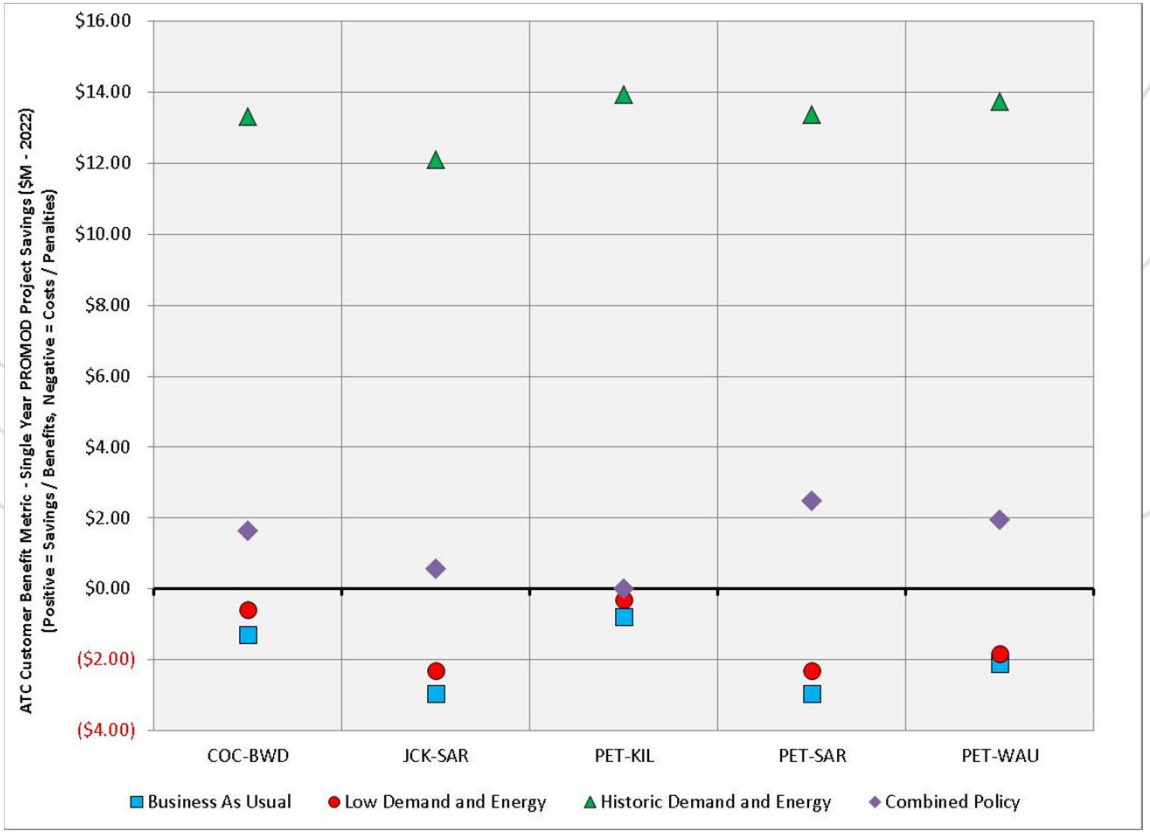
Petenwell – Saratoga Area Conclusions

- Economic analysis has not shown strong justification for a larger, more robust project
- Work to implement a special protection scheme is on-going

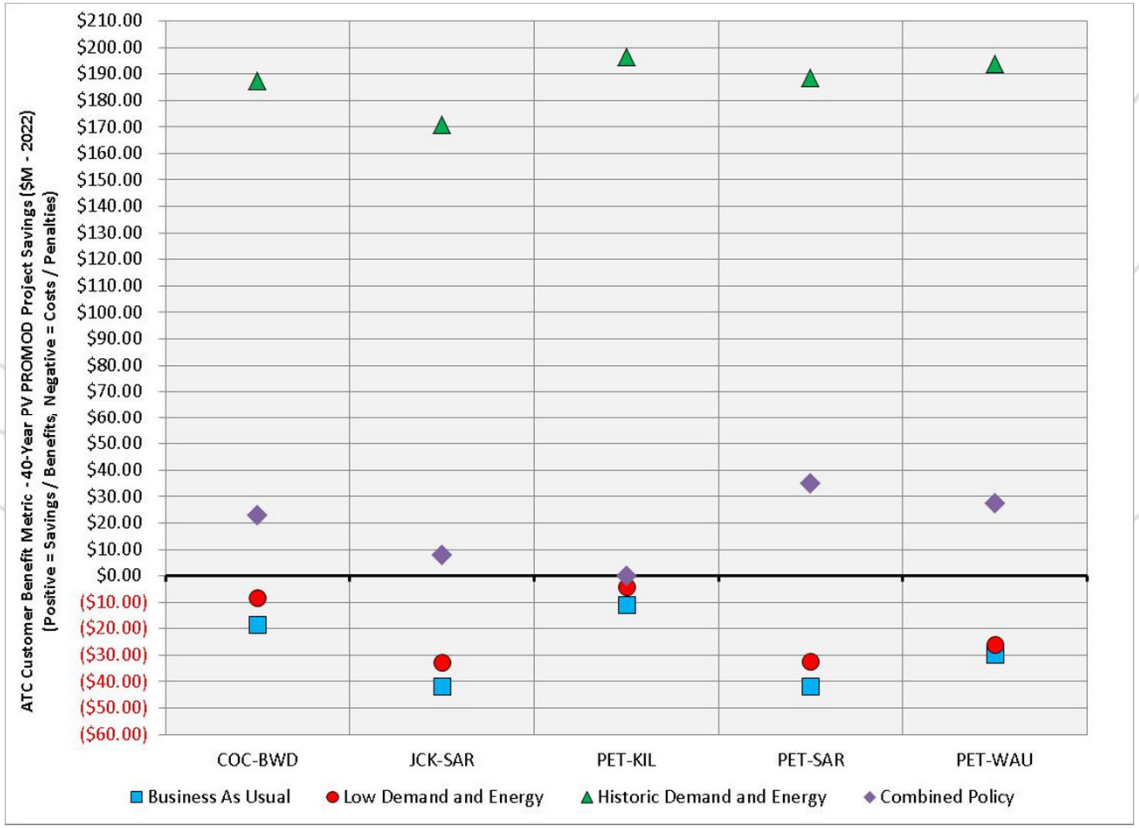
ATC 2022 – PROMOD Modeling Updates

- ATC's Economic Planning Team strives to use the most accurate and update modeling assumptions
- Updates made since November:
  - Retired Kewaunee Nuclear Plant
  - Removed Barnhart-Branch River Project

ATC 2022 – Analysis Results
Single-Year PROMOD Savings
Petenwell-Saratoga Area



ATC 2022 – Analysis Results
40-Year Present Value PROMOD Savings
Petenwell-Saratoga Area



ATC 2022 – Analysis Results
Petenwell-Saratoga Area

Project	ATC Benefit Impact ($M - 2022)			
	Business As Usual	Low Demand and Energy	Historic Demand and Energy	Combined Policy
Petenwell-Badger West-Saratoga 138 kV project	($2.96)	($2.30)	$13.39	$2.48
Council Creek-Birchwood 138 kV Project	($1.30)	($0.58)	$13.31	$1.63
Jackson County-Saratoga 161 kV Project	($2.96)	($2.31)	$12.11	$0.57
Petenwell-Kilbourn 138 kV Project	($0.77)	($0.30)	$13.95	$0.00
Petenwell-Wautoma 138 kV Project	($2.10)	($1.83)	$13.75	$1.95

Project Review – Milwaukee Area 138 kV

Alternative 1: Re-conductor the Existing Granville – Butler 138 kV Line

- Estimated Cost: $4.5M

Alternative 2: Second Granville – Butler 138 kV Line

- Estimated Cost: $5.9M

Alternative 3: Granville – Butler – Tamarack 138 kV Line

- Previous Estimated Cost: $3.9M
- Updated Estimated Cost: $1.7M

Alternative 4: Close Cornel – Fiebrantz 138 kV Line & Adding a Series Reactor on the 138 kV line

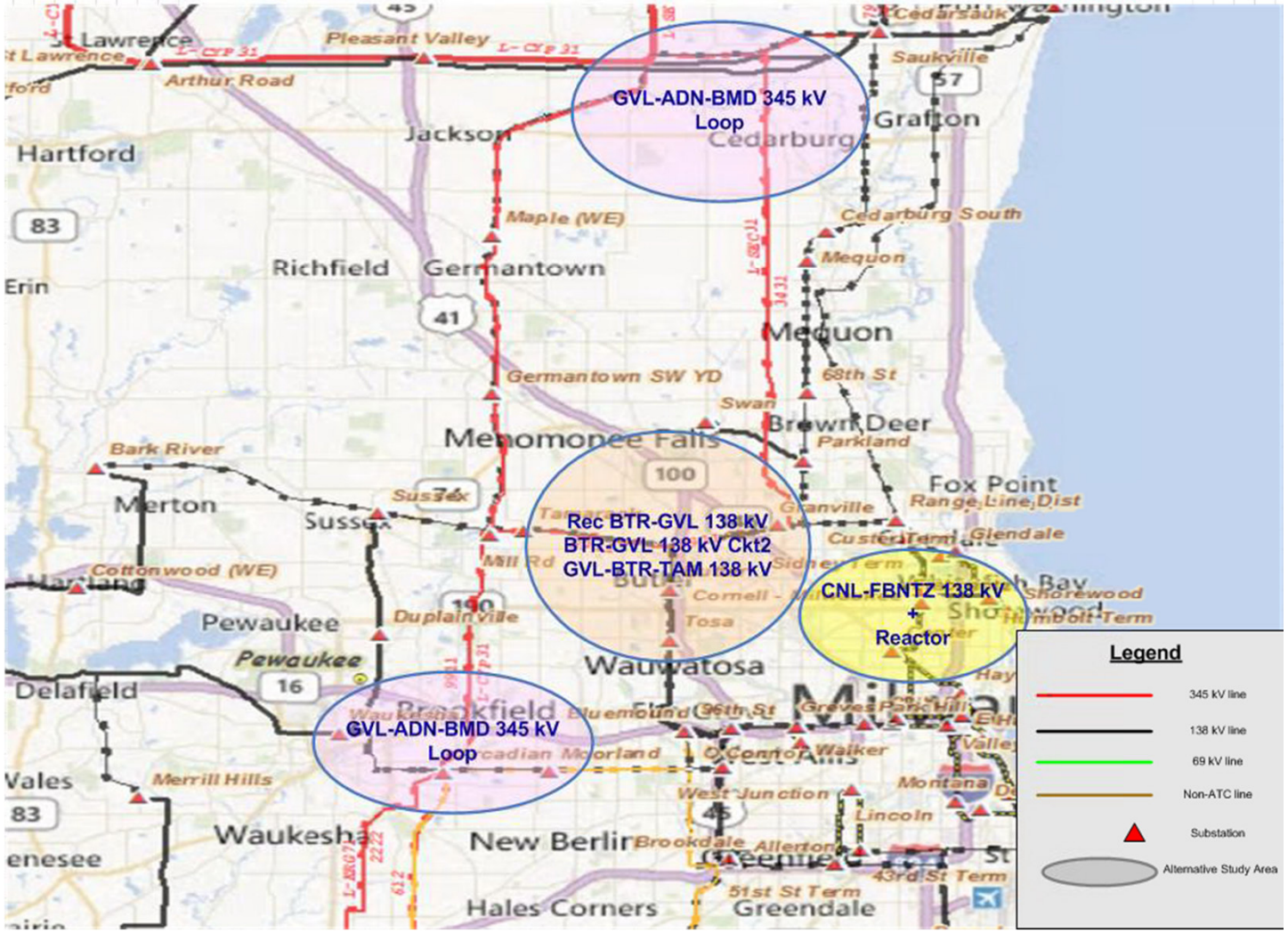
- Estimated Cost: $6M

Alternative 5: Granville – Arcadian – Bluemound 345 kV Loop

- Estimated Cost: $22M

ATC Order 890 Indicative Alternatives – Milwaukee Area

Note: These Indicative Alternative Study Areas are for illustrative purposes only and do not reflect actual routes.



ATC 2022 – Analysis Results
Alternatives Analyzed

Project Description	2022 Business As Usual			
	ATC Benefit Impact ($M - 2022)	40-Year PV Savings ($M - 2012)	Estimated Project Cost ($M - 2012)	Benefit - to - Cost Ratio
1) Reconductor BTR-GVL 138 kV	$1.28	$14.61	$4.50	3.25
2) Second BTR-GVL 138 kV	$0.16	$1.82	$5.90	0.31
3) GVL-BTR-TMRCK 138 kV	$0.56	$6.41	$1.70	3.77
4) Close CNL-FBNTZ 138 kV + Series Reactor	$0.51	$5.82	$6.00	0.97
5) GVL-AND-BMD 345 kV Loop	$0.33	$3.71	$22.00	0.17

Note:

High level Benefit – to – Cost ratio Calculation

Nominal Discount Rate = 6.7%

The Results Include Kewaunee Generation

ATC 2022 – Analysis Results
Preferred Alternatives

Granville - Butler - Tamarack 138 kV Line	Business As Usual
40-Year PV Savings ($M - 2012)	8.3
40-Year PV Revenue Requirement (M$ - 2012)	2.2
Benefit - to - Cost Ratio	3.73

- Projected In-Service Date: 2014-2015
- Kewaunee and Barnhart-Branch River are not included in this analysis

Moving Forward:

- ATC will monitor the congestion in this area
- Other alternatives are not dismissed
  - Potential benefits were not captured
  - Insignificant congestion in the models on Butler – Granville 138 kV line

Congestion Summary

2022 Business As Usual Future				
Constraints	Annual Binding Hours		Congestion Severity Index	
	Base	Alternative 3	Base	Alternative 3
Butler - Granville 138 kV Line	39	0	2.27	0.00
Butler-Tap - Butler 138 kV Line	0	5	0.00	0.48
Butler - Bluemound 138 kV Ckt1	1	19	0.00	0.41

Kewaunee Retirement Sensitivity

2022 Business As Usual Future			
Constraints	**Annual Binding Hours**		
	Base (With Kewaunee)	**Base (WO Kewaunee)**	**% Reduction**
Butler - Granville 138 kV Line	96	39	58

Questions?

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