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# 2013 Economic Planning Study Results

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# Introduction

- **Economic Planning Analysis Metrics**
  - Customer Benefit Metric
  - Loss Evaluation
- **Project Review**
  - Marquette-Mackinac 138 kV
  - Marquette-Mackinac 138 kV + Increase in Straits Flow Capability (B2BDC)
  - Butler-Bluemound 138 kV
- **Project Analysis and Results**

# PROMOD Energy Benefits Description

- PROMOD used to analyze 2023 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<sub>2</sub> Emissions (CO<sub>2</sub> 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 2023 – Analysis Results

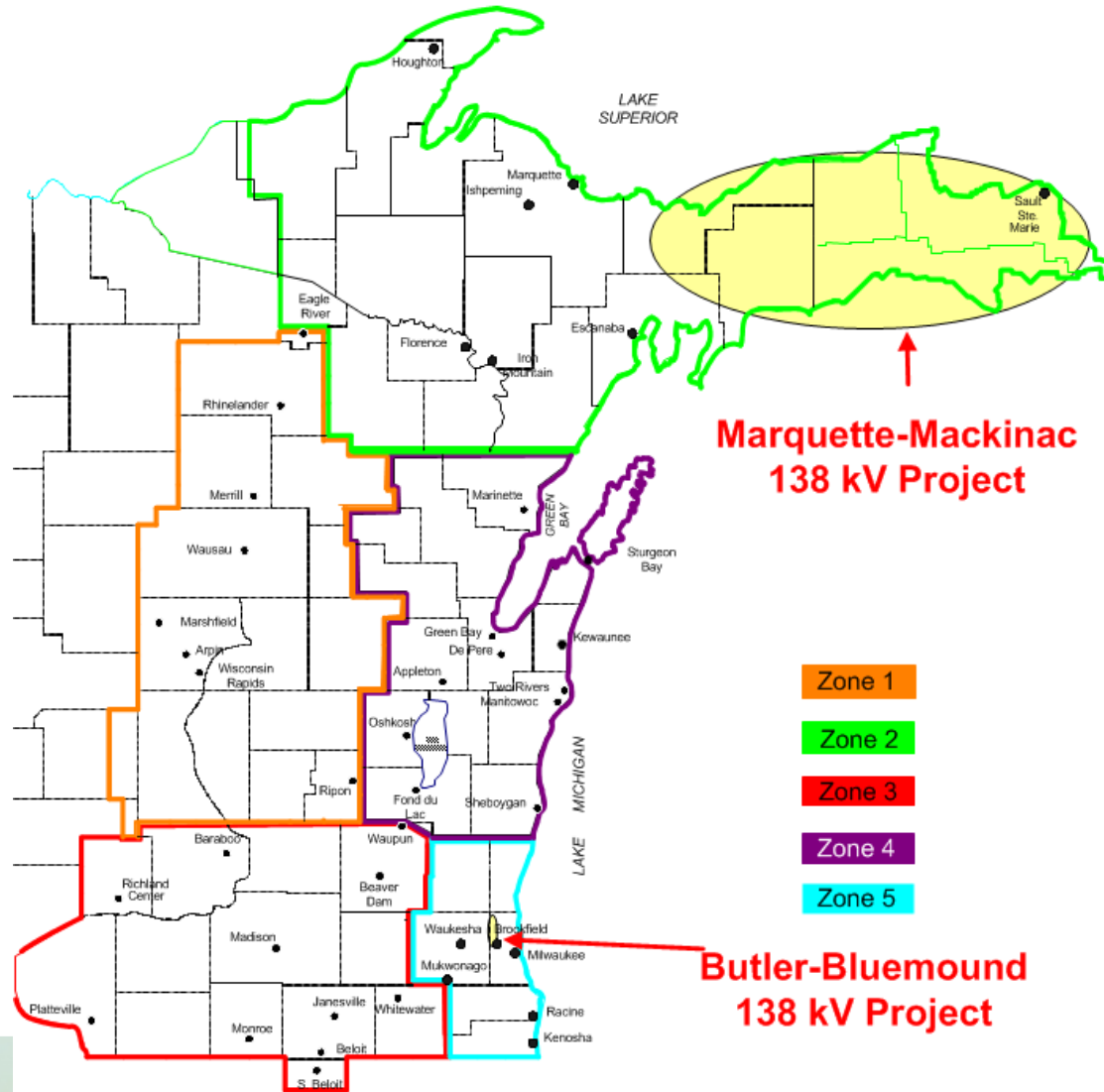
- **Single-Year PROMOD Savings**
  - Shown in Millions of Dollars for 2023 (\$M – 2023)
  - Savings based on difference analysis using Customer Benefit Metric
- **40-Year PROMOD Savings**
  - Shown in Millions of Dollars for 2014 (\$M – 2014)
  - Savings based on difference analysis using Customer Benefit Metric
  - Calculations based on:
    - Assumed 40-Year Economic Life of Project
    - 3.0% Inflation Rate
    - 6.7% Nominal Discount Rate

# ATC 2023 – PROMOD Modeling Updates

- ATC's Economic Planning Team strives to use the most accurate and update modeling assumptions
- Updates made MISO MTEP models:
  - Removed Barnhart-Branch River Project
  - Update small distributed generation mapping
  - Environmental Economy Future – Correct RRF mapping
  - Updated generation characteristics
  - Updated generation maintenance schedules
  - Updated non-conforming and non-scalable load profiles
  - Added 645 Distributed Resources to model future potential EE and DR (totaling 6,405 MW)

ATC 2013 Economic Planning Analysis – Study Projects

Constrained Area
Marquette – Mackinac 138 kV Project
Butler – Bluemound 138 kV Project





# Marquette-Mackinac Area Congestion Summary – Business As Usual

2023 Business As Usual Future						
Constraints	Annual Binding Hours			Shadow Price (\$/k)		
	Base	UP Alt	UP Alt + B2BDC	Base	UP Alt	UP Alt + B2BDC
Pine River-Hiawatha 69 kV	2075	232	238	\$27.70	\$4.51	\$4.61
Straits Interface	3046	3042	2940	\$25.95	\$25.83	\$24.38



# Marquette-Mackinac Area Congestion Summary – Environmental

## 2023 Environmental Future

Constraints	Annual Binding Hours			Shadow Price (\$/k)		
	Base	UP Alt	UP Alt + B2BDC	Base	UP Alt	UP Alt + B2BDC
Pine River-Hiawatha 69 kV	2622	557	550	\$27.44	\$7.53	\$7.60
Straits Interface	3845	3853	3754	\$53.09	\$53.87	\$50.92

# Marquette-Mackinac Area Congestion Summary – Generation Shift

2023 Generation Shift Future						
Constraints	Annual Binding Hours			Shadow Price (\$/k)		
	Base	UP Alt	UP Alt + B2BDC	Base	UP Alt	UP Alt + B2BDC
Pine River-Hiawatha 69 kV	616	51	54	\$6.63	\$0.76	\$0.60
Straits Interface	3443	3458	3354	\$27.30	\$26.14	\$27.59



# Marquette-Mackinac Area Congestion Summary – Low Growth

2023 Low Growth Future						
Constraints	Annual Binding Hours			Shadow Price (\$/k)		
	Base	UP Alt	UP Alt + B2BDC	Base	UP Alt	UP Alt + B2BDC
Pine River-Hiawatha 69 kV	412	95	92	\$4.52	\$1.10	\$1.11
Straits Interface	3262	3174	3201	\$18.66	\$18.99	\$18.08



# Marquette-Mackinac Area Congestion Summary – Robust Economy

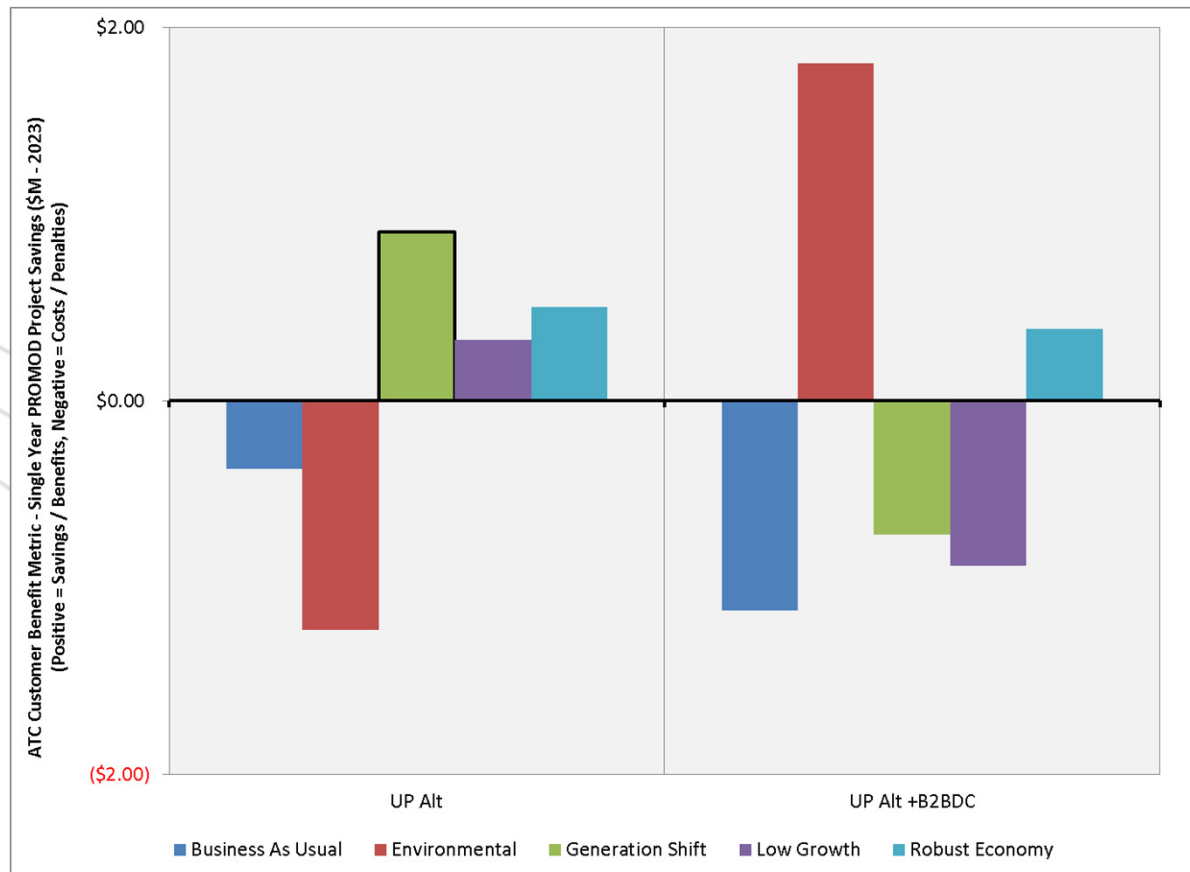
2023 Robust Economy Future						
Constraints	Annual Binding Hours			Shadow Price (\$/k)		
	Base	UP Alt	UP Alt + B2BDC	Base	UP Alt	UP Alt + B2BDC
Pine River-Hiawatha 69 kV	2376	194	185	\$49.11	\$4.76	\$4.53
Straits Interface	3945	3926	3839	\$48.78	\$49.07	\$46.34



# ATC 2023 – Analysis Results

## Single-Year PROMOD Savings

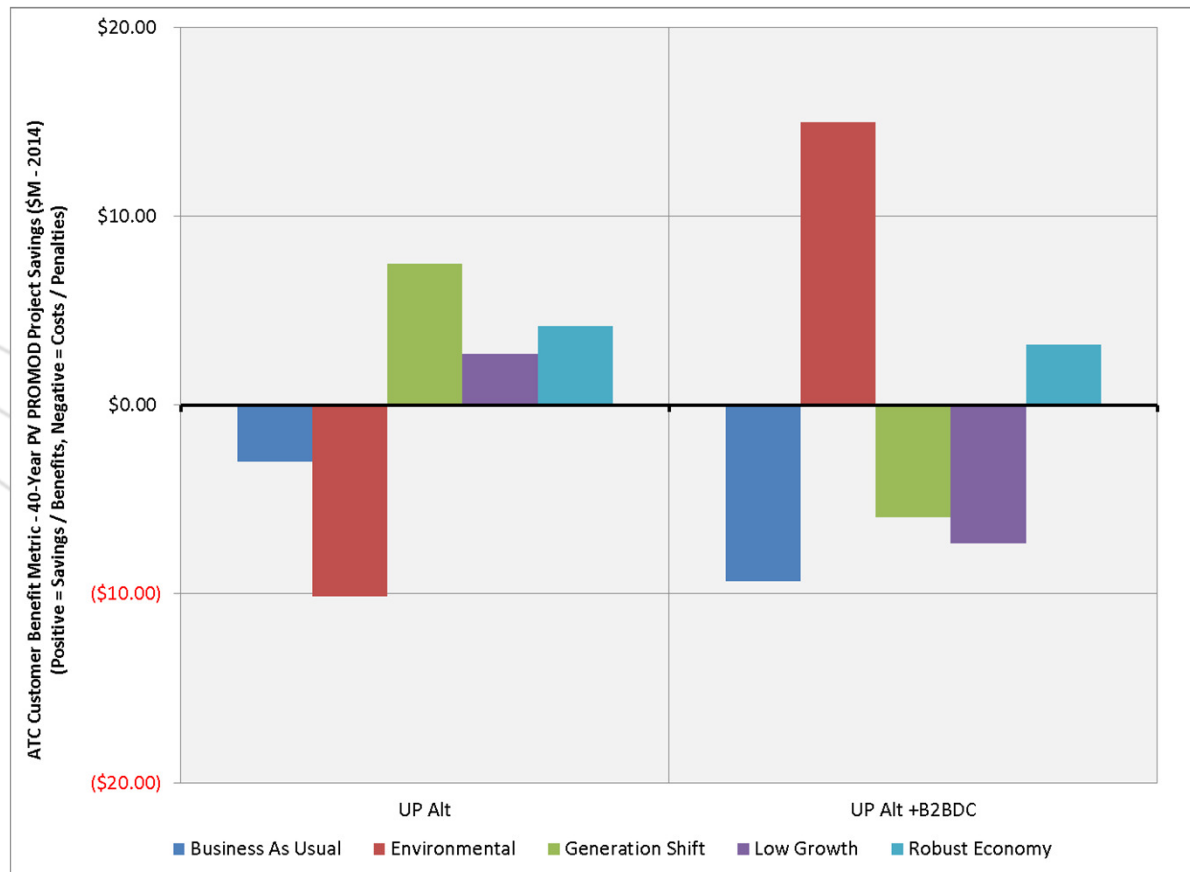
### Marquette-Mackinac and Marquette-Mackinac + B2BDC



# ATC 2023 – Analysis Results

## 40-Year Present Value PROMOD Savings

### Marquette-Mackinac and Marquette-Mackinac + B2BDC



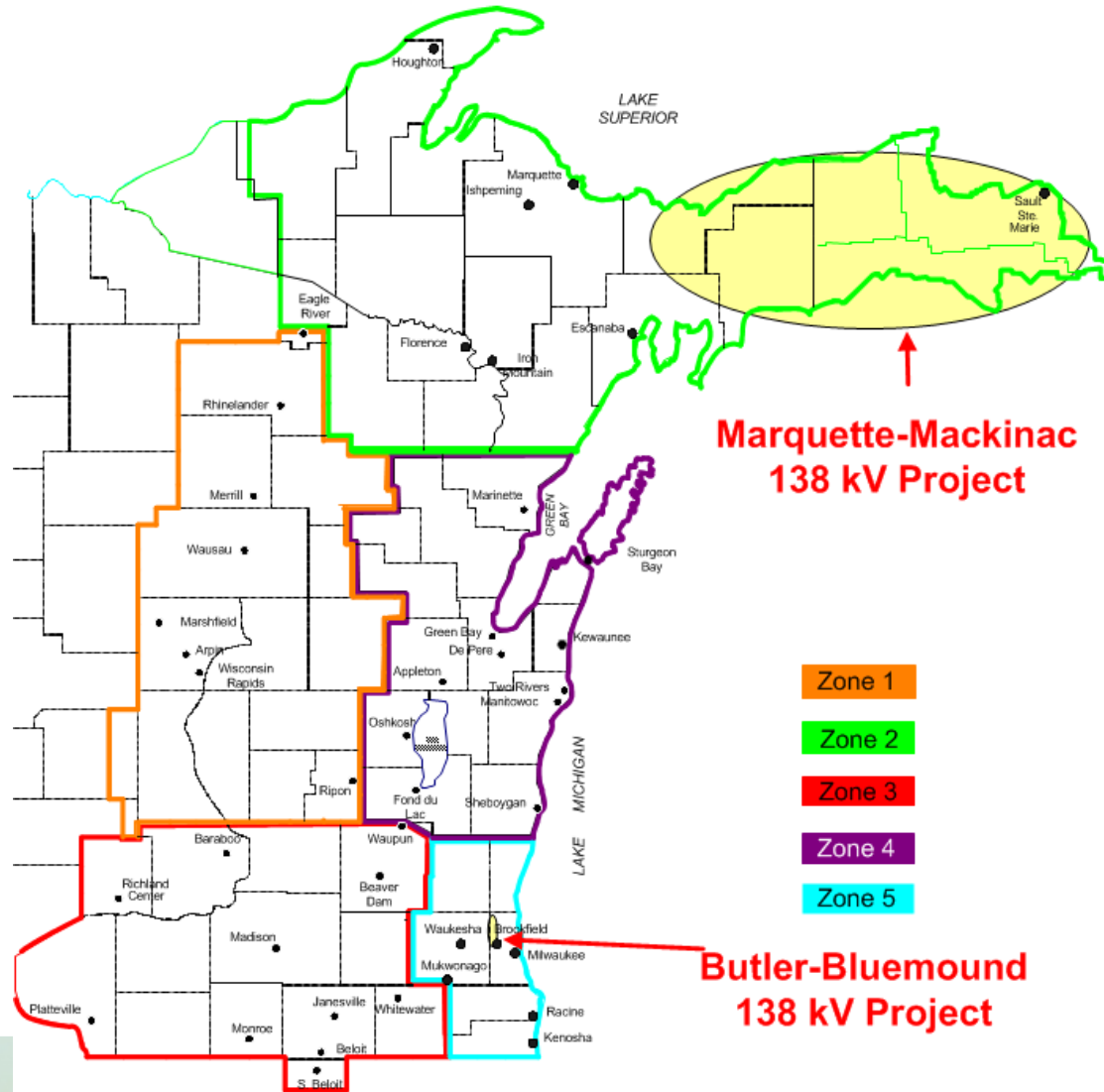
# Marquette-Mackinac Area Conclusions

- Not strong economic benefit for larger project
- Straits Flow Control is a low cost solution to congestion
- Expanding Straits Flow Control capability doesn't show benefits for ATC Customers
- ATC recommends to continuing to monitor the study area



ATC 2013 Economic Planning Analysis – Study Projects

Constrained Area
Marquette – Mackinac 138 kV Project
Butler – Bluemound 138 kV Project



# Bluemound-Butler 138 kV Area Congestion Summary – Business As Usual

2023 Business As Usual Future				
Constraints	Annual Binding Hours		Shadow Price (\$k)	
	Base	BMD-BTR	Base	BMD-BTR
Butler-Granville 138 kV	11	11	\$0.61	\$0.61
Butler-Bluemound 138 kV	8	0	\$0.29	\$0.00

# Bluemound-Butler 138 kV Area Congestion Summary – Environmental

2023 Environmental Future				
Constraints	Annual Binding Hours		Shadow Price (\$k)	
	Base	BMD-BTR	Base	BMD-BTR
Butler-Granville 138 kV	556	1160	\$125.44	\$207.38
Butler-Bluemound 138 kV	776	0	\$169.37	\$0.00

# Bluemound-Butler 138 kV Area Congestion Summary – Generation Shift

2023 Generation Shift Future				
Constraints	Annual Binding Hours		Shadow Price (\$k)	
	Base	BMD-BTR	Base	BMD-BTR
Butler-Granville 138 kV	0	0	\$0.00	\$0.00
Butler-Bluemound 138 kV	31	0	\$2.05	\$0.00

# Bluemound-Butler 138 kV Area Congestion Summary – Low Growth

2023 Low Growth Future				
Constraints	Annual Binding Hours		Shadow Price (\$k)	
	Base	BMD-BTR	Base	BMD-BTR
Butler-Granville 138 kV	1	1	\$0.00	\$0.00
Butler-Bluemound 138 kV	22	0	\$1.52	\$0.00

# Bluemound-Butler 138 kV Area Congestion Summary – Robust Economy

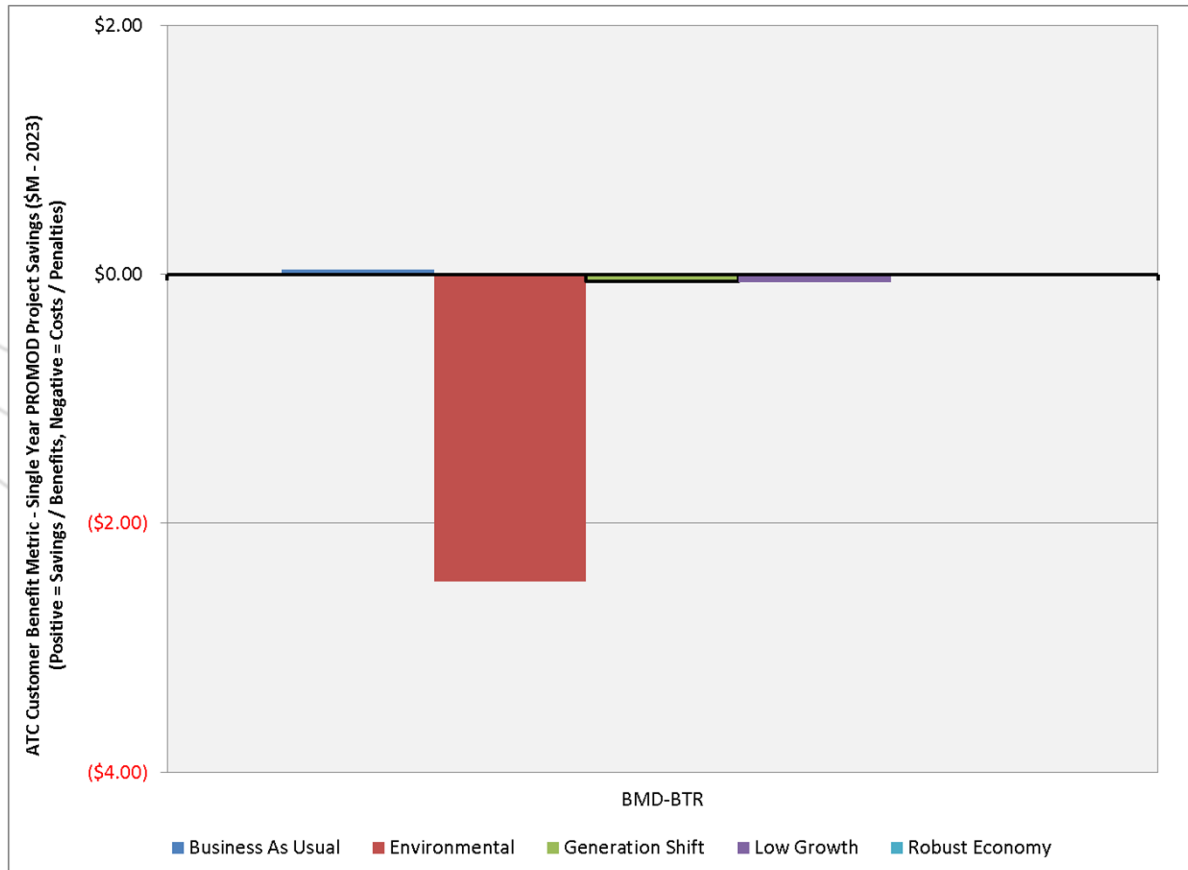
2023 Robust Economy Future				
Constraints	Annual Binding Hours		Shadow Price (\$/k)	
	Base	BMD-BTR	Base	BMD-BTR
Butler-Granville 138 kV	18	19	\$1.68	\$1.74
Butler-Bluemound 138 kV	5	0	\$1.85	\$0.00



# ATC 2023 – Analysis Results

## Single-Year PROMOD Savings

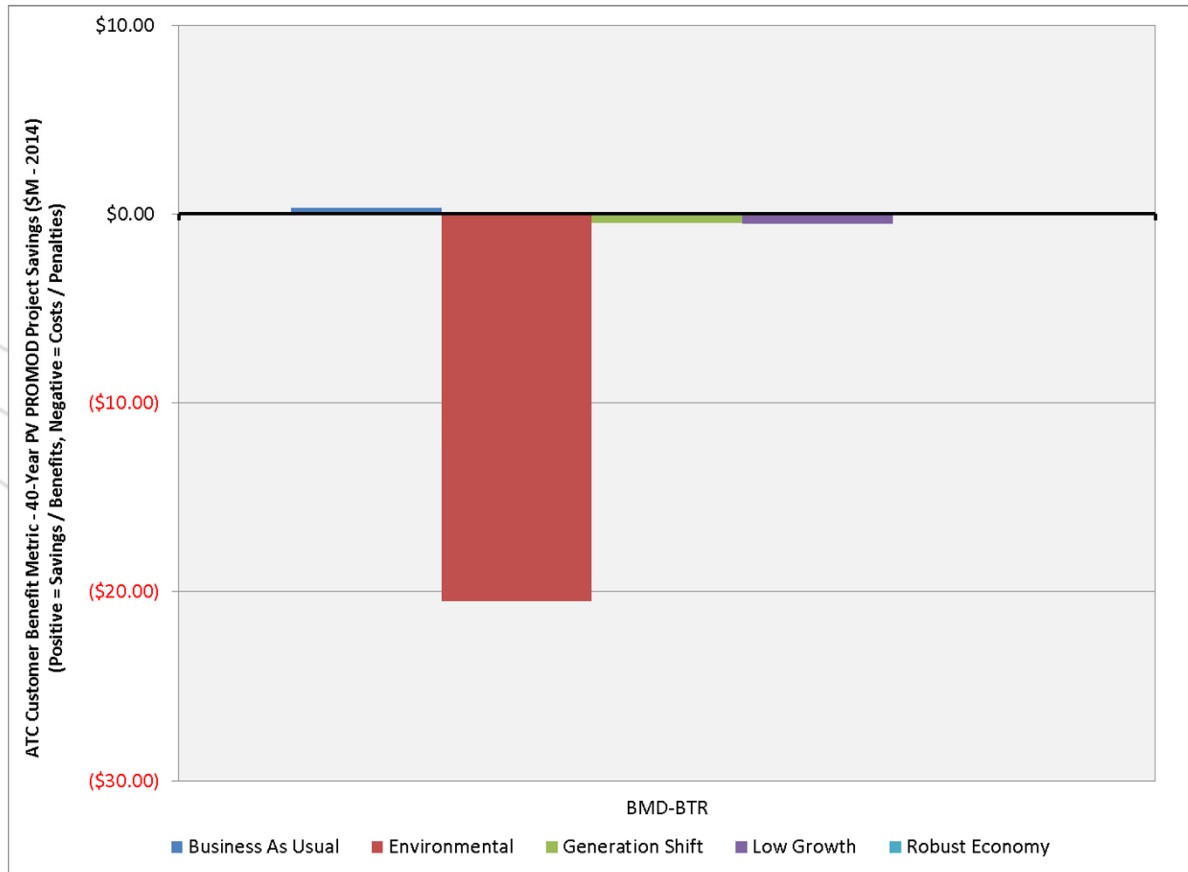
### Bluemound-Butler 138 kV



# ATC 2023 – Analysis Results

## 40-Year Present Value PROMOD Savings

### Bluemound-Butler 138 kV





# Bluemound-Butler Area Conclusions

- Not strong economic benefit for larger project
- Already proposed projects in area address congestion
- ATC recommends to continuing to monitor the study area

# Questions?

## ATC Economic Planning

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Thank you for your time!

