A large, white, lattice-structured transmission tower stands against a clear blue sky. Several high-voltage power lines are visible, stretching across the frame from the tower towards the right. The tower is the central focus of the background image.

Transmission Expansion Advisory Committee Meeting

2011 Market Efficiency Analysis Update

November 3, 2011



Cloverdale-Lexington 500 KV Line Upgrade (MEP-B-11)

MEP-B-11 Cost/Benefit Analysis

Project Description

- Increase Operational Limit of Cloverdale – Lexington 500 kV Transmission Line
- Expected in-service date=2017

Project Costs

- Conservative estimate of \$100 million
- Cumulative Net Present Value of project costs during first 15 years of Project life is \$156 Million based on a carrying charge rate of 17.9%

Project Benefits

- Cumulative Net Present Value of project benefits during first 15 years of the Project life is \$2.3 Billion based on discount rate of 7.7%.

$$\Delta \text{Total Energy Market Benefit} = 0.7 * \text{PC} + 0.3 * \text{NLP}$$

$$\Delta \text{Total Energy Market Benefit} = 0.7 * (\$1,601) + 0.3 * (\$3,945)$$

$$\Delta \text{Total Energy Market Benefit} = \$2.3 \text{ Billion}$$

Benefit/Cost Ratio = \$2.3 billion/\$156 million

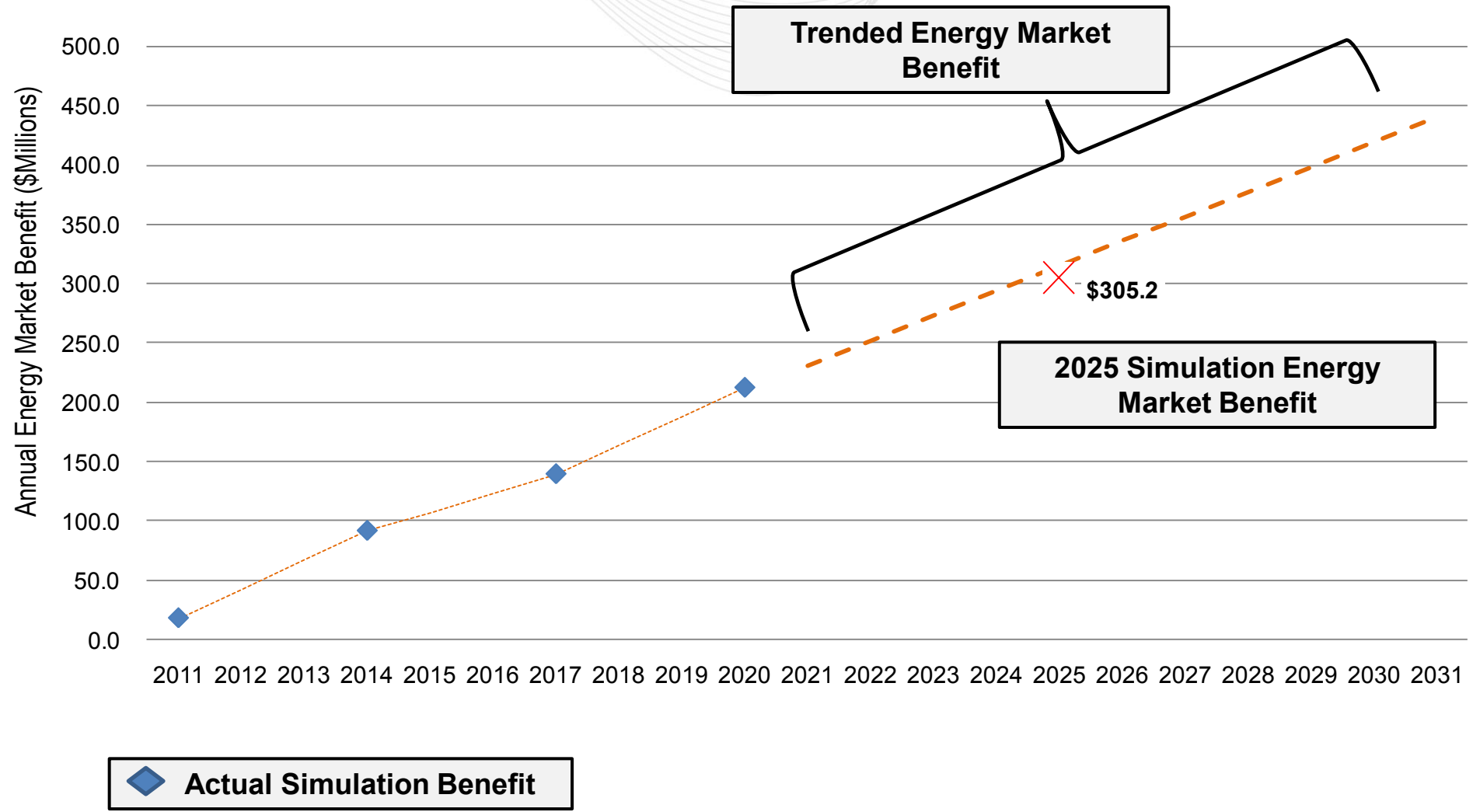
Benefit/Cost Ratio = 14.76

Benefit/Cost Ratio >1.25 **PASSED**

Annual Energy Market Benefit (\$Millions)

Study Year	Net Load Payment Benefit	Production Costs Benefit	Energy Market Benefit
2017	106.2	153.5	139.3
2018	200.3	147.9	163.6
2019	294.5	142.2	187.9
2020	388.6	136.5	212.2
2021	383.0	165.6	230.8
2022	430.3	175.4	251.9
2023	477.6	185.1	272.9
2024	524.9	194.9	293.9
2025	572.2	204.6	314.9
2026	619.6	214.4	335.9
2027	666.9	224.1	357.0
2028	714.2	233.9	378.0
2029	761.5	243.6	399.0
2030	808.8	253.4	420.0
2031	856.2	263.1	441.0
Total NPV	\$3,945	\$1,601.	\$2,304

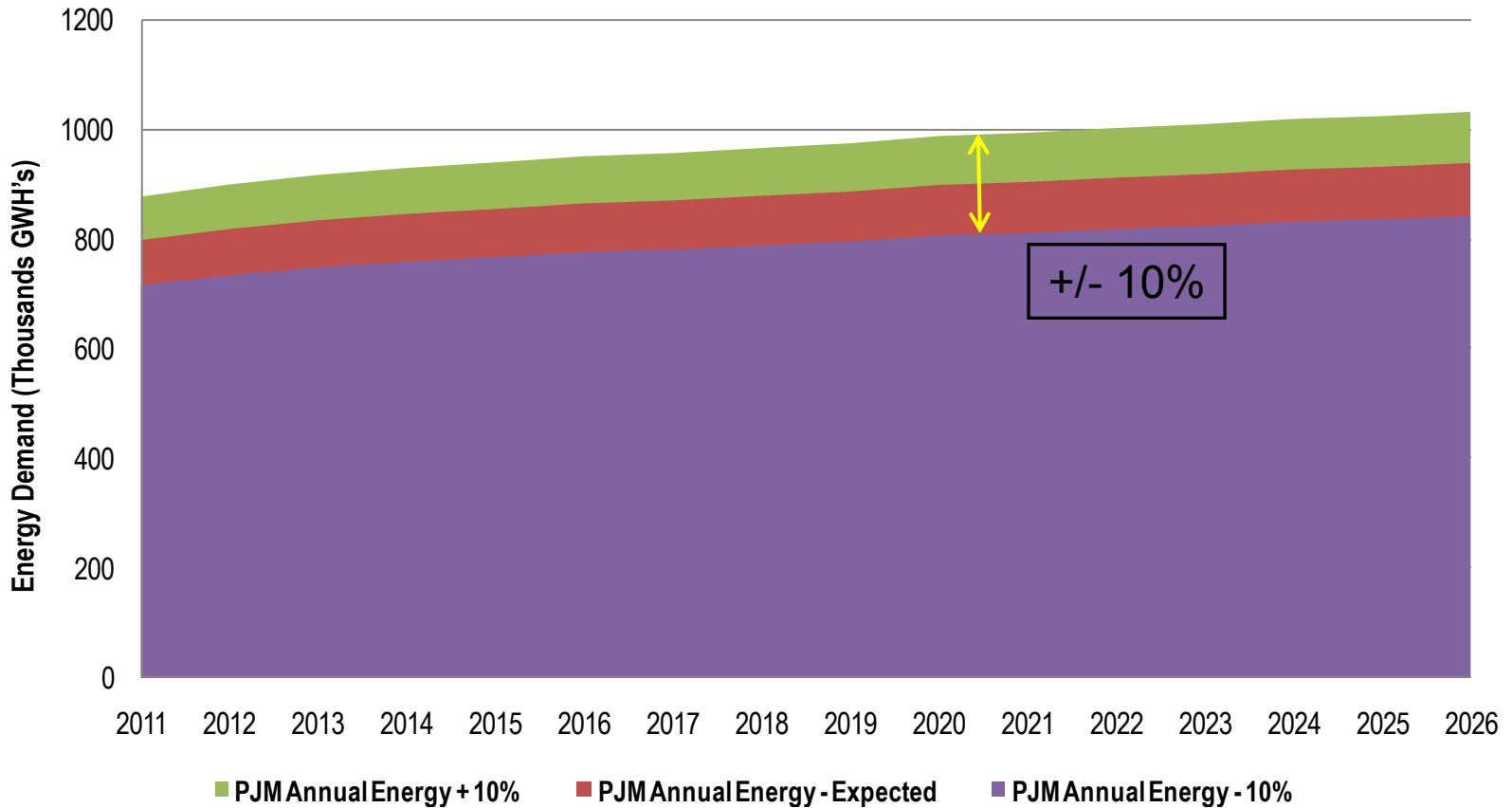
MEP-B-11 Annual Energy Market Benefit



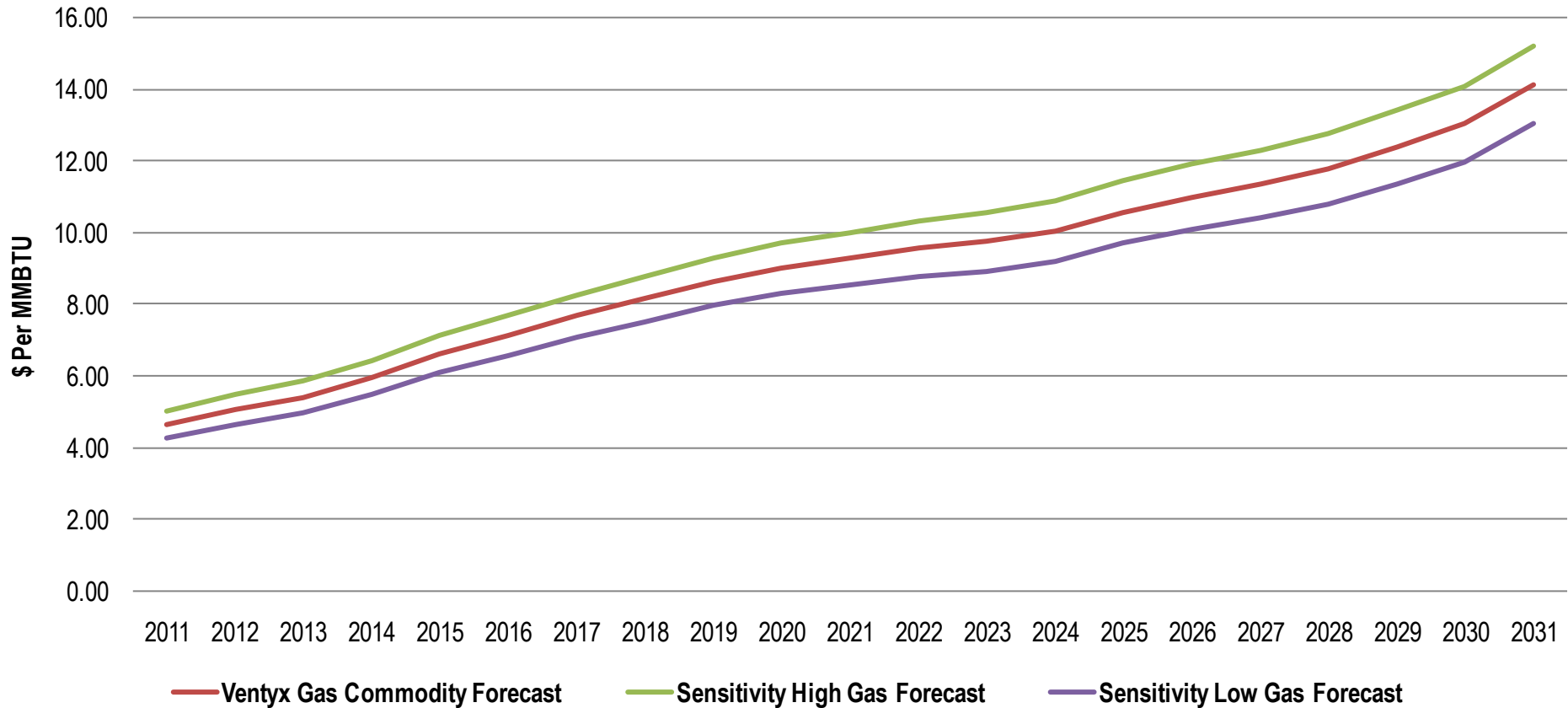
- **Load Sensitivity**
 - Modeled a 10% Increase and Decrease in load

- **Gas Commodity Price Sensitivity**
 - Modeled Upper and Lower Range of Ventyx Expected Commodity Price based on 12 month Distribution of Nymex Futures Henry Hub Traded Prices (2013 – 2023)

RTO Total Energy Demand (Thousands GWH's)



Ventyx Gas Commodity Forecast



MEP-B-11 Sensitivity Results

Scenario	Benefit/Cost Ratio
Base	14.76
Low Load	10.02
High Load	4.96
Low Gas	11.5
High Gas	16.1

Low Load Case

Lower Loading of Transmission System Results in Less congestion and cheaper means of re-dispatch.

High Load Case

By increasing the limits on Cloverdale - Lexington there are more West to East transfers, thus higher loading and congestion. In a high load case, congestion caused by West to East transfers are exacerbated whereas the benefits of the project do not grow as quickly.

Low Gas Case

More opportunities for gas units in the east to be committed results in less dependence on West to East Transfers.

High Gas Case

More dependence on generation in PJM West results in more West to East Transfers.

- Cloverdale-Lexington 500 KV Line Upgrade (MEP-B-11) summary

- Driver for project is for both Reliability and Markets
- Sensitivity analysis on results of Cloverdale-Lexington upgrade around key input assumptions show project still beneficial
- Year 2025 high level results match with trend
- Zonal summary results - Posted
- Recommendation to Board in December

Market Efficiency Projects

COMED AREA

COMED Area Proposed Projects –Update including Reliability Light Load upgrades

Project Number	Description	Expected ISD	Voltage	Estimated Costs (\$ millions)	Benefit/Cost	Updated Benefit/ Cost*
MEP-A-1	Byron-Cherry Valley-Pleasant Valley 345 KV	2016	345	112.5	0.75	N/A
MEP-A-2	Byron-Pleasant Valley 345 KV	2016	345	105	0.96	N/A
MEP-A-3	Cherry Valley - Pleasant Valley 345 KV	2016	345	67.5	2.74	1.1
MEP-A-4	Byron - Charter Grove- Wayne 345 KV, Charter Grove 345/138 KV TX.	2016	345	275	0.24	N/A
MEP-A-5	Byron - Wayne 345 KV	2016	345	175	0.41	N/A

* Updated Benefit/cost Ratio includes addition of upgrades associated with Reliability Light Load analysis identified at October 2011 TEAC.

- MEP-A-3 no longer passes 1.25 threshold and might create reliability issues.
- Not necessary to rerun other projects since Benefit/Cost would only get lower.
- No Projects in COMED AREA to be recommended for Market Efficiency

- Update Base Results
 - Add Light Load Upgrades
 - Add Reactive Upgrades
 - Apply new Reactive Interface Ratings
 - Rerun appropriate cases
- Study new submitted projects