

Background

Following Technical Meeting #2, the Alliance for Affordable Energy circulated a request to the service list on May 10, 2021, that ENO include a fourth Stakeholder Scenario in the IRP analysis using MTEP Future #3 (link [here](#)). EPG has since engaged MISO in discussions regarding the data sources, inputs, and modeling processes that MISO employed in creating Future #3. Based on these discussions, EPG has concluded that it is not feasible to directly replicate the MTEP Future #3 in the IRP analysis for the reasons discussed below. However, adjustments can be made to ENO’s proposed Scenario 3 that should achieve the Stakeholders’ apparent goal of creating a bookend market construct that accounts for policy outcomes that would aggressively drive retirements of legacy generation and replacement with renewables. Modifying Scenario 3 in this way would also keep the total number of Planning Scenarios at three, which would in turn allow the possibility of modeling five Planning Strategies in the IRP.

Modeling Methodology

Like MISO, ENO is using capacity expansion to develop the MISO market. However, MISO uses EGEAS (Electric Generation Expansion Analysis System) and PROMOD for its capacity expansion and production cost modeling work, while ENO uses Aurora. Aurora and PROMOD are different production cost simulation software applications, each with its own proprietary database and database formats. To translate the PROMOD database into an Aurora database, an automated process would have to be developed or created to translate many gigabytes of data from PROMOD-readable format into Aurora-readable format. Whether such a process could be created is unknown, but it certainly would not be possible within the current ENO IRP schedule. Any attempt at manual modeling of the PROMOD database in Aurora would not be possible within the IRP schedule either and it is unknown what additional modifications and adjustments may be needed to develop a fully compatible Aurora version of the PROMOD model and produce an output that avoids significant errors.

Proposed ENO Scenario 3 Modifications

The table below shows the proposed Scenarios 1 and 2 provided at Technical Meeting #2, as well as a proposed, modified Scenario 3 that incorporates the key assumptions from MISO’s MTEP Future #3 in a format that can be modeled in Aurora. Below the table are discussions of the key assumptions and how these align the modified Scenario 3 with Future #3.

ENOL 2021 IRP
 Response to Requested Stakeholder Scenario

	Scenario 1	Scenario 2	Scenario 3 (Original)	Scenario 3 (Modified)
Description	Reference	Decentralized Focus (DSM & renewables)	Economic Growth with an Emphasis on Renewables	Economic Growth with an Emphasis on Renewables
Peak / Energy Load Growth	Reference	Low	High	High
Natural Gas Prices (Levelized Real, 2021\$/MMBtu)	Reference	Low	High	High
DR / EE / DER Additions	Medium	High	Medium	Medium
Market Coal Retirements	Reference (60 years)	Accelerated (55 years)	Accelerated (50 years)	Accelerated (30 Years)
Legacy Gas Fleet Retirements	Reference (60 years)	Accelerated (55 years)	Accelerated (50 years)	Accelerated (30 Years)
CO2 Tax Assumption (Levelized Real, 2021\$/short ton)	Reference	Reference	High	High

Load Growth / DSM Comparison

ENO proposes using the Company’s “High” load forecast. In the MTEP Futures report linked above, MISO states that under Future #3, it is assumed that the entire MISO Market experiences an energy growth rate of 1.71% (CAGR) and a peak load growth of 1.41% (CAGR). Entergy has not developed the full market model for purposes of the ENO IRP, and therefore doesn’t have a fully reflective growth rate that incorporates both MISO North and MISO South. However, the energy CAGR for MISO South, developed in support of ENO’s “High” load forecast case, is 1.62% for 2022-2041 (<0.10% difference). The process in building out the MISO North market would result in a similar growth rate. Similar to the energy growth rate, the peak load growth rate has not been developed for the

entire market. However, the overall Entergy peak load reflects a CAGR of 1.6% from 2022-2041, which is higher than the MTEP assumption of a 1.41% CAGR.

The development of the proposed High load growth case for ENO's IRP is consistent with the description by MISO. Both forecasts assume a high penetration of electrification driven by a combination of building electrification and EVs. ENO's case also assumes higher behind the meter solar adoption as well as more aggressive DSM assumptions. Although these assumptions slightly counteract the higher growth, the Company strongly believes that these assumptions align with potential aggressive sustainability goals across the MISO footprint.

Natural Gas Price Comparison (see Slide 2 of the Attachment)

Entergy proposes using the Company's "High" gas price forecast. As described on the left chart of Slide 2, MISO uses the same GPCM gas price forecast across all three of its Futures. That gas price assumption is consistently lower than the Company's "High" gas price forecast shown in the chart on the right side of Slide 2. Generally, MISO's price forecast falls between ENO's "Low" and "Reference" cases, so using the "High" price forecast should actually support greater penetration of renewables in the market buildout.

Coal and Legacy Gas Retirement

ENO would adopt the retirement assumptions included within MISO's Future #3 for Coal and Legacy Gas in modified Scenario 3. Entergy would continue using a 30-year life assumption for CCGTs, which is shorter than the MISO assumption of 35 years.

CO₂ Price Comparison Assumption

ENO proposes using the Company's "High" CO₂ price forecast. MISO did not use a CO₂ price assumption but instead utilized a "target" resource mix of 50% renewables. ENO's high CO₂ price forecast is intended to reflect aggressive CO₂ policies and legislation. Given the combination of a high gas-price forecast and CO₂ price forecast in the modified Scenario 3, it is expected that the capacity expansion model used to build out the MISO market will incorporate a large portion of non-gas, no-CO₂ resources to meet capacity and energy needs.

Technology Capital Cost Assumptions (see Slides 3-5 of the Attachment)

ENO proposes using the Company's installed cost estimates for the various technologies. As shown on Slide 3 of the Attachment, the installed costs ENO is assuming for purposes of the IRP are consistently lower than those sourced from NREL and assumed by MISO. MISO's cost assumptions are shown in \$2020 while ENO's are in \$2021. Additionally, as shown on Slide 4, MISO assumes 60% PTCs for wind only through 2022, where ENO has assumed a 60% PTC through 2025. Similarly, ENO assumes higher ITCs between 2022 and

2025 for solar. As seen on Slide 5, ENO's installed cost for solar starts lower in the front end of the modeling period, and, while flatter compared to the MISO curve, results in very similar installed costs in the last half of the planning period.

Conclusion

Based on the information provided above and in the Attachment, the Company believes that the modified Scenario 3 is consistent with the intent of the stakeholder interest to include MISO's Future #3, would provide a policy-driven bookend as requested by the stakeholders in Technical Meeting #2, and can be incorporated within the Aurora modeling framework in the time provided by the revised procedural schedule.