Scenario #1 Draft March 23, 2022

(Applicability: Utilities located in the Michigan portion of MISO Zone 2 and MISO Zone 7)

This scenario aligns with MISO's December 2021 Futures Report, Future 1. and reflects substantial achievement of state and utility announcements. This scenario incorporates 100% of utility integrated resource plan (IRP) retirement announcements and retirement assumptions throughout the MISO footprint, as identified in MISO Future 1. As subsequent MISO Futures Reports are released, updated retirement assumptions identified in the Future most similar to Future 1 of the December 2021 report may be used. . This scenario assumes that emissions decline, driven by state goals and utility plans throughout the MISO footprint creating at least a 63% carbon reduction by 2040 from the baseline year of 2005 for the MISO region. This trajectory of carbon reduction is expected to continue beyond 2040.

This scenario assumes that demand and energy growth are driven by existing economic factors, with moderate electric vehicle (EV) adoption and customer electrification, resulting in moderate footprint wide demand and energy growth rates. Utilities should use the most recent United States Energy Information Administration (EIA) Annual Energy Outlook (AEO) Reference Case[1] for forecasted EV adoption rates. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change,[2] electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand.

- Natural gas prices utilized are consistent with the Reference Case projections from the EIA most recent AEO.[17]
- Moderate EV adoption and customer electrification result in moderate footprint-wide demand and energy growth. Within Michigan, EV and electrification forecasts should be blended with historical sales such that after 5 years, Michigan's load and demand increase reflects the source forecasts for EV and electrification technologies. Load profiles of EVs and electrification technologies should be clearly delineated and presented individually such that it is clear how they each impacted the overall energy and demand forecast. EV forecasts should be based off the Reference Case in

[1] http://www.eia.gov/outlooks/aeo/tables_ref.php

[2] Midcentury datapoints for several climate change variables are available through Great Lakes Integrated Sciences and Assessments (GLISA) and Center for Climatic Research (CCR) at the University of Wisconsin-Madison. This information should be used to aid in establishing forecasts that include the impacts of climate change.

the most recent EIA AEO. Electrification technology forecasts[3] should be based off of either established proprietary forecasts or publicly available data;

- Resource assumptions:
    - Resources assumptions– MISO Future 1 retirements for thermal and nuclear generation resources published in the most recent Futures Report should be used when available along with recent public announcements. Maximum age assumption by resource type as specified by applicable regional transmission organization (RTO) should also be used. Specific new units will be modeled if under construction or with regulatory approval (i.e., Certificate of Necessity (CON), IRP cost pre-approval, or signed generator interconnection agreement (GIA). Generic new resources are assumed consistent with the scenario description, considering anticipated new resources currently in generation interconnection queue, and should be chosen based upon economics.
- Not less than 35% of the state's electric needs should be met through a combination of EWR and renewable energy by 2025, as per MCL 460.1001 (3).
- The utility can illustrate how the plan is expected to meet state goals for greenhouse gas emissions specific to the power industry sector.
- For all instate electric utilities that are eligible to receive the financial incentive mechanism for exceeding mandated energy saving targets of 1% per year, EWR should be based upon the maximum allowed under the incentive of 1.5% and should be based upon an average cost of MWh saved. The model should include an EWR supply cost curve to project future program expenditures beyond baseline assumptions without any cap.[21]
- Existing renewable energy and storage production tax credits and renewable energy investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- Long and short duration storage resources are considered. Energy storage resources are modeled using available best practice methodologies to the extent that such guidelines exist. Allow for multiple market revenue streams where applicable.
- Technology costs for thermal units and wind track with mid-range industry expectations.
- Technology costs and limits to the amount available for EWR and demand response programs will be determined by the most recent State-wide Potential Study where applicable.

[3] Electric Vehicle adoption as forecasted in the most recent EIA AEO East North Central Census Region Reference Case, http://www.eia.gov/outlooks/aeo/tables_ref.php

- Technology costs for solar, storage, and other emerging technologies decline with commercial experience consistent with NREL or other publicly available reputable sources.
- Existing PURPA QFs up to the utility's "must buy" obligation MW threshold are assumed to be renewed unless the QF indicates otherwise either publicly or directly to the utility.
- Existing PURPA QFs greater than the utility's "must buy" obligation MW threshold are assumed to continue operations within the wholesale market beyond the termination date of the contract unless the QF indicates otherwise either publicly or directly to the utility.

Scenario #1 Sensitivities:

1. Fuel cost projections

   A. Increase the natural gas fuel price projections from the base projections to at least the high EIA gas price in the most recent EIA Low Oil and Gas Supply forecast natural gas fuel price projections at the end of the study period.[22]

2. Load projections

   A. High load growth: Increase the energy and demand growth rates by at least a factor of two above the base case energy and demand growth rates on a per customer basis. MISO load growth: A load growth scenario that is consistent with the most recent MISO futures.

   B. Low load growth: EV adoption and electrification are slower than expected. Demand and load growth are consistent with 5-year historical growth rates prior to 2020 and the onset of COVID-19.

   C. If the utility has retail choice load in its service territory, model the return of 50% of its retail choice load to the utility's capacity service by the demonstration year of the utility's next capacity demonstration filing. Assume that load is returned in two phases with the first half returning halfway through the 4-year forward demonstration period and the remainder returning in the demonstration year of the utility's next capacity demonstration filing.

3. If the utility is not already achieving 2% EWR, ramp up the utility's EWR savings to at least 2.0%[23] of prior year sales over the course of four years**.** EWR savings remain at 2% throughout the study period.