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April 13, 2022

To: Kayla Gibbs, Michigan Public Service Commission

Re: Integrated Resource Plan (MIRPP-Filing Requirements)

Indiana Michigan Power Company (I&M or Company) submits these comments on the Michigan Public Service Commission (MPSC) Staff's March 24, 2022 presentation and Scenario # 1 and Scenario #2.

## **I. Introduction**

I&M is a multi-jurisdictional public utility that is regulated in the States of Michigan and Indiana. I&M serves approximately 130,000 retail customers in Michigan, located in predominantly rural areas of southwest Michigan. I&M's Michigan retail customers comprise approximately 15% of the total generation load served by I&M. The remaining customers are wholesale or Indiana retail. Importantly, I&M operates within the PJM Interconnection, L.L.C. (PJM) Regional Transmission Organization (RTO), while most Indiana and Michigan utilities operate in the Midcontinent Independent System Operator, Inc. (MISO) RTO.

## **II. Comments**

### **Scenario #1**

I&M comments:

- As stated at the beginning of the Scenario: "(Applicability: Utilities located in the Michigan portion of MISO Zone 2 and MISO Zone 7).
  - I&M comment: I&M is located in PJM in the AEP Load Zone and is not in any MISO Zone.
- The use of "state and utility announcements" is vague and undefined. For example, it is not clear if this is related to generation retirements, carbon goals, etc.
- I&M should be permitted to model comparable scenarios that achieve a comparable carbon reduction to the MISO Future 1.

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- This scenario assumes that demand and energy growth are driven by existing economic factors, with moderate electric vehicle (EV) adoption and customer electrification, **offset by increased adoption of customer owned distributed generation and recognize demographic trends.** (text in red should be included in requirement).
  - I&M comment: The footprint is unclear, is it the utility footprint, RTO footprint, etc.?
- Requirement: Utilities should use the most recent United States Energy Information Administration (EIA) Annual Energy Outlook (AEO) Reference Case1 for forecasted EV adoption rates.
  - I&M comment: utilities should use EIA or another reliable source for a forecasted EV adoption rates. EIA has historically under predicted adoption and does not provide the data the necessary level of granularity for utility load forecast.
- Recommendation: 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
  - I&M Comment: The five year requirement is unsupported and may be dependent upon which modeling techniques are used in the near term. For example, ARIMA time series model is not designed to reliably forecast out five years.
- Resource assumptions: I&M recommends this requirement be further addressed in the next stakeholder meeting to clarify what is being required. It is not clear what the intention is related to new and existing units. For example, the maximum reference to age for new units and existing units is unclear. Also, it is not clear on what is company owned or not owned.
- MISO Future 1 retirements for **existing** thermal and nuclear generation resources published in the most recent Futures Report should be used
  - I&M comment: include language in red.
- Recommendation: Maximum age assumption by resource type as specified by applicable regional transmission organization (RTO) should also be used.
  - I&M Comment: Move this sentence to after “Specific new units” statement on new units.
- Recommendation: Scenario #1, Sensitivity 2. Load projections



- I&M comment. Subpart A. not clear what assumptions are to be made for load growth. If base is negative, the load growth gets more negative. The absolute value for growth may be assumed as necessary.
- 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).
  - I&M comment: need clarification on how this is defined/measured.
- Long and short duration storage resources are considered.
  - I&M comment: These durations will need defined. Long duration storage options in particular may require more discussion given the development stage of such options.
- If the utility is not already achieving 2% EWR, ramp up the utility’s EWR savings to at least 2.0%<sup>23</sup> of prior year sales over the course of four years. EWR savings remain at 2% throughout the study period.
  - I&M comment: The EWR rate assumes 2% would always be available based on the prior year. This should be replaced to be consistent with the maximum achievable potential from the Market Potential Study (MPS).

**Scenario #2:**

- I&M comment: I&M reserves the right to use comparable PJM information to the MISO Report, since I&M is in the PJM RTO. This would include recognizing any differences between the RTOs that should be considered.
- Many of the comments for Scenario #1 apply to Scenario #2.
- Coal units will primarily be retired based upon carbon emissions and secondarily based upon economics.
  - I&M Comment: Coal unit retirement decisions may be based upon a combination of carbon emissions and economics considerations such that neither one is “primary”. For example, based upon If some form of carbon emission limits force coal retirements, economics are
- Specific new units are modeled if under construction or with regulatory approval (i.e., IRP cost pre-approval, CON, or signed GIA).
  - I&M Comment: There may be limited information available for such units.



- Long and short duration storage resources are considered.
  - I&M Comment: These durations will need defined. Long duration storage options in particular may require more discussion given the development stage of such options.
- EWR
  - I&M comment: The EWR rate assumes 2% would always be available based on the prior year. This should be replaced to be consistent with the maximum achievable potential from the Market Potential Study (MPS).

## Scenario #1 Draft March 23, 2022

(Applicability: Utilities located in the Michigan portion of MISO Zone 2 and MISO Zone 7) [What is Scenario #1 for Utilities that are not in MISO Zone 2 or 7?](#)

This scenario [directionally](#) aligns with MISO's December 2021 Futures Report, Future 1, and reflects substantial achievement of state and utility announcements [related to electric generation and transmission planning](#).

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. [For the Utility performing the analysis, their generating unit retirement assumptions may be different than what was included in MISO futures 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 [CO2](#) 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 [MISO or Utility?](#) 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<sup>1</sup> 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,<sup>2</sup> 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.<sup>17</sup>
- 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, [see Chad's comment](#), 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 the most recent EIA AEO. Electrification technology forecasts<sup>3</sup> should be based off of either established proprietary forecasts or publicly available data;

<sup>1</sup> [http://www.eia.gov/outlooks/aeo/tables\\_ref.php](http://www.eia.gov/outlooks/aeo/tables_ref.php)

<sup>2</sup> 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.

- Resource assumptions:

- Resources assumptions–

Existing Generating Units: Assume 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 for all generating units, except for your own you may adjust to reflect alternate life assumptions. For units that it is not clear of its retirement date a Maximum age assumption by resource type as specified by applicable regional transmission organization (RTO) should also be used.

New Generating Units: 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 in-state electric utilities that are eligible to receive the financial incentive mechanism for exceeding mandated energy saving targets of 1% per year, EWR energy savings should be based upon the maximum allowed under the incentive of 1.5% and should be based upon an average cost of MWh saved. (Why do we need " and should be based upon an average cost of MWh saved; when the next sentence to me says we should provide the costs of EWR with a supply curve...seems contradictory"). The model should include an EWR supply cost curve to project future program expenditures and potential energy savings. (the use of the phrase without any cap is unrealistic...shouldn't this refer to some MPS?)<sup>21</sup>.
- 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.
- 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.

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<sup>3</sup>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](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.<sup>22</sup>

#### 2. Load projections

A. High load growth: For the filing Utility's Load Obligation 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. For the region included in the Scenario, A load growth scenario that is consistent with the most recent MISO futures.

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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.

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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. (For PJM utilities, we include Choice load in the base load forecast, so for this sensitivity we reduce our Choice load by 50%, even though this doesn't comply with our RTO?)

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

### 3.23.22 Draft of MIRPP Scenario #2 Generally, make consistent with Scenario 1

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

This scenario aligns with the Miso's December 2021 Futures Report, Future 3. It incorporates 100% of utility IRPs and announced state and utility goals within their respective timelines and assumes that 100% of the utility and state goals are met. This scenario incorporates the retirement announcements and assumptions throughout the MISO footprint, as identified in Future 3. As subsequent Futures Reports are released, updated retirement assumptions identified in the Future most similar to Future 3 of December 2021 Futures Report may be used. Market energy purchases are modeled at a carbon intensity consistent with the relevant RTO system average. MISO expected system averages are identified in Future 3.

This scenario assumes significant advancements toward electrification that drives a total energy and demand annual? growth rates to 1.71% and 1.41% respectively (within the MISO zones 2 and 7, eastern inconnect, Utility jurisdiction?). Emissions decline, driven by state goals and utility plans throughout the MISO footprint, creating at least an 80% carbon reduction by 2040 from the baseline year of 2025 for the MISO region. For Utilities operating in PJM, assume 80% carbon reductions by 2040 from the baseline year of 2005 for the PJM region. This trajectory of carbon reduction is expected to continue beyond 2040.

Utilities should use the most recent EIA AEO East North Central Census Region Reference Case<sup>1</sup> for forecasted EV adoption rates with a multiplier of 5 to illustrate significant advancements in EV adoption. 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<sup>2</sup>, 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 Reference Case projections from the United States Energy Information Administration's (EIA) most recent annual Energy Outlook.
- Current demand side resources and utility distributed generation programs remain in place and additional growth in those programs would happen if they were economically selected by the model to help comply with the specified carbon reductions in this scenario.
- EV adoption and customer electrification adoption cause adjustments in overall load profiles throughout the planning horizon.
- For generating units not owned or operated by the filing Company. Non-nuclear, non-coal generators will be retired in the year the age limit is reached and driven by announced retirements. Nuclear units are assumed to have license renewals granted and remain online.

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<sup>1</sup> [http://www.eia.gov/outlooks/aeo/tables\\_ref.php](http://www.eia.gov/outlooks/aeo/tables_ref.php)

<sup>2</sup> 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.

- Utilities should use the most recent EIA AEO Reference Case<sup>3</sup> 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<sup>4</sup>, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand.
- Specific new units are modeled if under construction or with regulatory approval (i.e., IRP cost pre-approval, CON, or signed GIA).
- 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.
- Existing renewable energy production and storage tax credits and renewable energy investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- ~~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 wind, solar, storage and other renewables decline ~~linearly~~ with commercial experience and forecasted at levels 30% ~~lower than mid-range industry expectations,~~ by the end of the ~~20 year~~ study period.
- ~~Isn't this just a comment.~~
- ~~EWR and DR costs and savings potential limits to the total resource amount available, will be determined by their respective state-wide potential study. Shouldn't this bullet be moved to Scenario 1~~
- Existing PURPA contracts are assumed to be renewed. 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.

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## Scenario #2 Sensitivities:

### 1. Fuel cost projections

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

<sup>3</sup> [http://www.eia.gov/outlooks/aeo/tables\\_ref.php](http://www.eia.gov/outlooks/aeo/tables_ref.php)

<sup>4</sup> 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.

Supply forecast natural gas fuel price projections at the end of the study period.<sup>28</sup>

2. 80% carbon reduction in the utility's service territory relative to ?, modeled as a hard cap on the amount of carbon emissions, by 2030 as a sensitivity.<sup>29</sup>
3. Ramp up the utility's EWR savings to at least 2.0%<sup>30</sup> of prior year sales over the course of four years within the Utility's MI jurisdiction, using EWR cost supply curves provided in the 2021 supplemental potential study for more aggressive potential.<sup>31</sup> EWR savings remain at 2% throughout the study period.

DRAFT