

STATE OF MICHIGAN  
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter, on the Commission's own motion	)	
to implement the provisions of Section 6t(1) of	)	Case No. U-21219
2016 PA 341.	)	
_____	)	

At the October 27, 2022, meeting of the Michigan Public Service Commission in Lansing,  
Michigan.

PRESENT: Hon. Daniel C. Scripps, Chair  
Hon. Tremaine L. Phillips, Commissioner  
Hon. Katherine L. Peretick, Commissioner

**ORDER**

On December 21, 2016, Public Act 341 of 2016 (Act 341), an amendment to Public Act 3 of 1939 and Public Act 286 of 2008 (Act 286), was signed into law and became effective on April 20, 2017. Section 6t(3) of Act 341 requires each electric utility whose rates are regulated by the Commission to file an integrated resource plan (IRP) within two years from the effective date of Act 341. MCL 460.6t(3). Section 6t(3) states that the Commission “shall issue an order establishing filing requirements, including application forms and instructions, and filing deadlines for an integrated resource plan filed by an electric utility whose rates are regulated by the commission.” *Id.* On November 21, 2017, in Case No. U-18418 (November 21 order), the Commission approved the Michigan Integrated Resource Planning Parameters (MIRPP) pursuant to Sections (1) and (2) of Act 341. MCL 460.6t(1) and (2). The MIRPP states that “[e]ach electric utility whose rates are regulated by the Commission shall demonstrate compliance with the

Michigan Integrated Resource Planning Parameters as a condition of Commission approval of its respective integrated resource plan pursuant to MCL 460.6t(3).” November 21 order, p. 88.

On September 11, 2019, in Case No. U-20464 (September 11 order), the Commission accepted and adopted the Statewide Energy Assessment (SEA) Final Report which discussed gaps in existing planning processes and identified areas that could be improved, such as increased diversity in supply resources, improved generation diversity and revisions to currently approved utility IRP modeling parameters and filing requirements. September 11 order, p. 9; *see also*, Case No. U-20464, filing #U-20464-0063, pp. 190-192.

On October 17, 2019, in Case No. U-20645 (October 17 order), the Commission commenced the MI Power Grid Initiative under which the Commission made the following commitment:

Advanced planning processes for electric investments (resources, transmission, and distribution) will be examined to ensure modeling tools, assumptions, and processes are adapting to technology change, and to better integrate discrete planning activities currently being conducted for new resources (e.g., generation, demand-side options), transmission, and distribution, as detailed in the 2019 Statewide Energy Assessment. Work will also be done to quantify the value of resilience, particularly as it relates to distributed energy resources, as well as the value of diversity in the electric resource mix, in order to ensure proper consideration of both when evaluating proposed investments.

October 17 order, p. 8 (emphasis omitted).

On August 20, 2020, the Commission opened the docket in Case No. U-20633 (August 20 order) and directed the Commission Staff (Staff) to begin outreach through a series of stakeholder sessions to research best practices in integrated resource and distribution planning pursuant to the SEA and MI Power Grid Initiatives. The Commission’s directives included “[i]dentifying potential revisions to the Commission-approved IRP modeling parameters or the filing requirements to better accommodate transmission alternatives in IRPs in preparation for the next formal review of the Michigan IRP Planning Parameters expected to take place in 2022.” August

20 order, pp. 3-4. Accordingly, the Commission initiated a collaborative to review and discuss improvements and ways to better align integrated resource planning and distribution planning, directed the Staff to coordinate with the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on the inclusion of public health and environmental justice consideration in future IRPs, and directed the Staff to file a May 27, 2021 report (May 27 report) outlining its findings and recommendations.

In its October 29, 2020 order in Case Nos. U-20633 *et al.*, the Commission provided an overview of the MI Healthy Climate Plan (MHCP), announced by Governor Gretchen Whitmer on September 23, 2020, through Executive Directive (ED) 2020-10 and Executive Order 2020-182. The MHCP commits Michigan to “pursue at least a 26-28% reduction below 2005 levels in greenhouse gas emissions by 2025 and to accelerate new and existing policies to reduce carbon pollution and promote clean energy deployment at the state and federal level.” October 29 order, pp. 4-5 (quoting ED 2020-10, p. 1). The Commission explained that Michigan will aim to achieve carbon-neutrality by 2050 and maintain net negative greenhouse gas emissions thereafter. October 29 order, p. 5 (citing ED 2020-10, p. 2). The Commission outlined that ED 2020-10 directs EGLE to expand its environmental advisory opinion filed in the Commission’s IRP cases under Section 6t of Act 341, MCL 460.6t, and file environmental advisory opinions in IRPs filed under Section 6s of Act 341, MCL 460.6s. October 29 order, p 5 (quoting ED 2020-10, pp. 2-3). The Commission provided that EGLE is directed to:

evaluate the potential impacts of proposed energy generation resources and alternatives to those resources, and also evaluate whether the IRPs filed by the utilities are consistent with the emission reduction goals included in this Directive. For advisory opinions relating to IRPs under both MCL 460.6s and MCL 460.6t, [EGLE] must include considerations of environmental justice and health impacts under the Michigan Environmental Protection Act. The Commission’s analysis of that evidence must be conducted in accordance with the standards of the IRP statute and the filing requirements and planning parameters established thereto.

October 29 order, p. 5 (quoting ED 2020-10, pp. 2-3). In light of this directive, the Commission found that “the process of updating utility IRP planning parameters and filing requirements should take into account the goals set by Michigan’s utilities and how those goals align with the greenhouse gas emissions targets set by Governor Whitmer.” October 29 order, p. 6.

On September 24, 2021, the Commission accepted the Staff’s May 27 report and adopted the recommendations made therein. The Commission directed the Staff to create a redline version of the MIRPP for review by stakeholders in the MI Power Grid Advanced Planning Phase II process and distribute this document to stakeholders no later than December 22, 2021. The Commission directed the Staff to engage in stakeholder meetings for Advanced Planning Phase III of the Integration of Resource, Transmission, and Distribution Planning MI Power Grid workgroup and provide the redline version of the MIRPP and Integrated Resource Plan Filing Requirements to stakeholders as part of this notice. Finally, the Commission directed the Staff to file its final draft of the MIRPP on June 30, 2022, in a new docket to be opened on the Commission’s own motion to update the MIRPP. Simultaneously, the Staff conducted stakeholder workgroups and proposed revisions to the IRP Filing Requirements. The IRP Filing Requirements, presented in Case No. U-18461, are meant to act as a companion guidance document to the MIRPP. While the MIRPP are statutorily required to be updated every five years under Section 6t(1)(f-i) of Act 341, MCL 460.6t(1)(f-i), utilities filing IRPs should rely on the most recently approved IRP Filing Requirements in conjunction with these IRP Planning Parameters.

On June 30, 2022, the Staff filed its draft MIRPP in this docket. On July 7, 2022, the Commission issued an order (July 7 order) setting two public hearings with the purpose of providing information about the parameters of the MIRPP draft report, to receive public comment

on the MIRPP draft report, and to answer questions about the MIRPP review process. Remote access to both hearings was also provided to any interested participant.

The first public hearing was held on Thursday, September 8, 2022, in Lansing, Michigan in the Commission's Lake Michigan hearing room before Administrative Law Judge Christopher D. Saunders (ALJ). Following opening remarks from the ALJ, the hearing continued with remarks from Chair Dan Scripps, Commissioner Tremaine Phillips, Commissioner Katherine Peretick, Naomi Simpson, Manager of the Commission's Resource Optimization and Certification section, gave a presentation that provided an overview of the IRP process and the two scenario and sensitivities combinations within the MIRPP with each representing a different vision of Michigan's energy future. The hearing was then opened for comment from the public, during which Gary Melow, representing Michigan Biomass, provided comment. No other comments were received.

The second public hearing was held on September 21, 2022, in Marquette, Michigan in the Founders Room of Northern Michigan University before the ALJ. Statements were again provided by Chair Scripps, Commissioner Phillips, and Commissioner Peretick. Staff member Jon DeCooman, a public utility engineer in the Commission's Resource Optimization and Certification section, provided a similar presentation on an overview of the IRP process and potential changes to the parameters as was presented in the first public hearing. Comments were then opened to the public. Jen Hill, Vice President of the Citizens Utility Board (CUB), provided an overview of CUB's initial comments that were previously filed in the docket.

In addition to the public hearings, the July 7 order further provided for any person to file written or electronic initial public comments in the docket by 5:00 p. m. (Eastern time (ET)) on September 12, 2022. Accordingly, initial comments filed in the docket are summarized below.

American Council for an Energy-Efficient Economy (ACEEE)

ACEEE comments on the Executive Summary and provides that the use of the assumptions and parameters outlined in the draft MIRPP for the required scenarios and sensitivities makes those assumptions crucially important. Accordingly, ACEEE continues, although ensuring consideration of a wide variety of resources is important, the use of flawed assumptions for energy waste reduction (EWR) costs and potential will undermine that objective. ACEEE also comments that the requirement under Section 6t(1) of Act 341 to re-examine the IRP parameters every five years is a lengthy gap and that is important not to lock in deficient assumptions for the next five years, noting it particularly important with regard to the 2021 Energy Efficiency (EE) Potential Study, which substantially underestimates EWR potential.

ACEEE comments next on—III. Energy Waste Reduction Potential Study (Part 3)—of the draft MIRPP, which describes the EWR potential study conducted by Guidehouse Inc., and outlines the EWR potential for the entire state of Michigan. ACEEE suggests the following strike bold edit on page 6 of the draft MIRPP.

Results were developed and are presented separately for the Lower and Upper Peninsulas. These results will be used to **help inform** EWR goal setting and associated program design for the MPSC.

ACEEE further suggests clarification under Scenario #1 that “administrative costs” include much more than internal utility bureaucratic administering, such as program marketing, providing customer information and education, and program evaluation.

Under – VII. Modeling Scenarios, Sensitivities and Assumptions (Part 7) – ACEEE comments on Scenario #1, which is applicable to utilities wholly located in the Michigan portion of Midcontinent Independent System Operator, Inc (MISO) Zone 2 and Zone 7, and encouraged the inclusion of multi-state utilities operating within those zones. ACEEE again notes that the inputs

and assumptions used regarding demand-side resources are critically important and that if incorrect or unnecessarily pessimistic inputs are used, the model will select less of the EWR resource than would be desirable. ACEEE comments that the language on page 30 of the draft MIRPP providing that “[t]here should be no cap on EWR savings levels beyond 1.5% or a cap on costs associated with EWR programs as long as the program portfolio is cost effective based on a [utility cost test] score of 1.0 or greater” should be clarified to remove any reference to the 2021 EE potential study as it should not be specified or implied as the sole or even primary source for assumptions, including removing footnote 21 hyperlinking that report, from the draft MIRPP because even the aggressive scenario in the EE report estimates only a 1.48% average annual EE savings. ACEEE also suggests including the following language, in added bold, on pages 31 and 35 of the draft MIRPP:

Technology costs and limits to the total resource amount available for EWR and DR [demand response] programs will be informed by the most recently Commission approved state-wide potential study and may be augmented by prior EWR and DR potential studies and/or additional research, **as well as by the actual experience of EWR programs in Michigan.**

ACEEE provides that most Michigan utilities have exceeded 1.5% annual savings for 2019 and 2020.

ACEEE next comments that the major increases in natural gas prices provide another reason that the 2021 EE Potential Study should not be used because the energy price assumptions in that report are too low and would result in an underestimation of how much EE is cost-effective.

ACEEE also comments that IRP assumptions based on the 2021 EE report results in IRPs claiming EE costs were higher than they should be, or on the flip side, suggesting higher savings levels such as the 2% annual savings target, might not be achievable.

Under Scenario #2 and Scenario #2 Sensitivities, ACEEE again comments that requiring the utilities to base their IRP assumptions on the 2021 EE potential study would at best result in their IRP claiming EE costs were higher than they should be, and at worst, suggesting that higher savings levels might not even be achievable. Finally, under VIII, Michigan IRP Modeling Input Assumptions and Sources (Part 8), ACEEE comments that the 2021 EE report should not be incorporated into the value in the emerging technology scenario as provided within the EWR Savings category. ACEEE strongly suggests that “using EWR Cost Supply Curve provided in the 2021 Supplemental Potential Study for more aggressive potential” should be stricken from the MIRPP.

#### Michigan Biomass

Michigan Biomass comments generally on the importance of including biomass as part of the overall energy generation diversity effort. In summary, Michigan Biomass comments that biomass is a highly diverse energy source that is baseload, dispatchable, a renewable backup for intermittent renewables, a carbon neutral source of generation with the same generating capabilities as fossil fuel, provides degree of certainty during the energy transition and coal plant closures, can generate during extreme weather conditions, combats climate change by displacing fossil fuels, is a cost-effective tool for sustainable forestry, and can be tailored to a specific fuel resource to supply electric power to the grid and thermal energy for other uses, which few other renewable energy resources can claim.

Michigan Biomass requests that the Commission include in the orders in Case Nos. U-21219 and U-18461 language that directs the Staff to continue to work with energy stakeholders like the biomass power industry to develop the appropriate assumptions, tools, and rules that ensure that diverse energy resources get a full and fair review in the MIRPP.



Michigan Energy Innovation Business Council and Advance Energy Economy (collectively MEIBC/AEE)

MEIBC/AEE first recommends including the energy storage target set by the MHCP by adding a bullet point to Part 7 Scenario #2 which reads: **Statewide, achieve 1,000 MW of energy storage by 2025, with an additional 1,500 MW added by 2030, with the ultimate goal of 4,000 MW by 2040.** MEIBC/AEE further recommends deleting the phrase “to the extent that such guidelines exist” should be deleted from both Scenario #1 and Scenario #2 as that phrase relates to energy storage modeling. Also in regard to modeling energy storage, MEIBC/AEE recommends that the Commission clarify the best practices that the utilities are expected to adhere to in an IRP, including, for example, sub-hourly modeling, most recent cost estimates, a net-cost-of-capacity approach, and modeling of participation in all markets in which storage is capable of providing services.

MEIBC/AEE further comments in Scenario #2 that, to account for atypical weather conditions, the following should be added: **Model the impact of atypical weather conditions that occur at least as frequently as once in ten years, either via a load forecast adjustment or a stochastic analysis of weather risks. Needs should be met within the bounds of required emissions reduction targets.**

Regarding EWR, MEIBC/AEE supports inclusion of a 2% EWR target in both Scenario #1 and #2. MEIBC/AEE, however, are concerned about the sole reliance on the Guidehouse Potential Studies (Guidehouse) EWR and demand response (DR) Potential Studies as those studies are unlikely to reflect accurate potential for savings due to their methodology and that they were completed from August 2020 to September 2021 and, therefore, recommend requiring the utilities

to augment the Guidehouse studies with prior EWR and DR potential studies and additional research.

MEIBC/AEE appreciates language in the draft MIRPP indicating distributed energy resources (DERs) be considered as both demand-side and supply-side resources. MEIBC/AEE, however, expresses concern that EVs capacity to serve as a grid resource is not properly captured in the MIRPP and that EVs should not only be considered as new load, but also, should be modeled as potential sources of generation and storage. Thus, to facilitate discussion and understanding of that resource, MEIBC/AEE recommends adding the following to PART 7 under either Section 15-Other Resources or Section 17 -EV Forecasts: (1) The Interstate Renewable Energy Council's "V2X Roadmap;" (2) The Citizens Utility Board's "The ABCs of EVs: A Guide for Policy Makers and Consumer Advocates;" (3) The ZEV Alliance's "Implementing Open Smart Charging;" and (4) The Institute for Energy Innovation's "Energy Storage Roadmap for Michigan."

#### Association of Businesses Advocating Tariff Equity (ABATE)

ABATE is generally supportive of the parameters in the draft MIRPP but comments that if Scenarios #1 and #2 are to be considered bookends on the range of possible outcomes then the resource decisions, costs, energy output, and emissions in those scenarios will necessarily be skewed and may not represent an accurate depiction of how a utility's resource portfolio will operate. ABATE recommends that the Commission require each utility to file an additional Scenario with sensitivities that provides the best indication of the actual operational and regulatory environment throughout the study period for that utility.

Consumers Energy Company (Consumers)

Consumers first comments that the company is in support of Modeling Scenario #1 but suggests the following edits, in bold, for variations in the MISO list of retirements.

For the utility performing the analysis, the generation unit retirement assumptions may vary for only the generation units **for which** the utility has decision making authority **or for any unit retirements that have been publicly announced since publication of the MISO report. The filing utility may incorporate more-recently announced retirements if practical.**

Consumers would also like better clarification and understanding of the assumptions for electric vehicle (EV) deployment. Specifically, Consumers seeks clarification as to whether this is in reference to MISO load.

Consumers further comments under Scenario #1 in regard to load profiles of EVs that the word “utility” should be added to the description as hourly or detailed load profiles are not likely modeled for non-utility demand areas. Consumers also suggests the following change for resource assumptions: “maximum age assumption by resource type as specified by applicable regional transmission organization (RTO) ~~should~~**can** also be used.” Consumers also comments that base assumptions related to EWR levels should be set at a minimum of 1.0%, as required by law and that expansion of EWR up to the maximum of 1.5% under the incentive or even beyond that limit should be supported based on economics. Lastly, Consumers comments that a load growth sensitivity is needed based on the following arguments: (1) federal and state mandates for carbon reduction targets related to the transportation sector make it unlikely that EV adoption is slower than expected; (2) transportation sector announcements are clearly moving in the direction of EV transformation; and (3) the scenario does not prescribe aggressive assumptions and thus slowing down EV growth is likely unreasonable.

For Scenario #2, Consumers comments that there is a reference to the load growth percentages in the Eastern Interconnect in the MISO Future Report that is unfamiliar to the company and should be clarified. Consumers also suggests the following edit in bold, “Market energy transactions are modeled at a carbon intensity consistent with the relevant RTO system average **or by a methodology supported by the utility**” because the energy transactions may be modeled as different areas or zones with different carbon intensities (not just a single RTO).

Consumers also seeks clarification for Sensitivity #2 to determine if the intent of the sensitivity is simply to consider retirement of coal facilities in Michigan and an 80% carbon reduction by 2030 or that Michigan would achieve a carbon net zero from the power sector by 2035 and whether each is a “goal” or a “target.”

Lastly, Consumers comments that there are several references to the year 2040 as well as a 20-year study period, however the IRP may cover horizons beyond 2040 and or the 20-year period.

#### Indiana Michigan Power Company (I&M)

I&M is a multi-jurisdictional public utility regulated in both Michigan and Indiana. I&M has general concerns with scenarios that include announcements and retirement assumptions which are not legislated, and not a confirmed future state of the world. I&M also notes concerns with the administrative burden of tracking “announcements” and goals” that may result in different interpretations and recommends that IRP rules be crafted in a way to be applied and interpreted consistently. I&M takes issue with the MISO Future 1 scenario, which requires utilities to assume IRPs are approved and implemented over 20 years, expressing that it is commonly understood that an IRP is not a commitment to a specific course of action and changes will occur. I&M believes using the MISO Future 1 assumption to include all utility IRP announcements would predetermine

capacity expansions that might not be implemented and that using announced goals is speculative and not appropriate for IRP modeling. I&M's specific comments related to Part 7 and Part 8 apply accordingly. In Part 7, I&M recommends the language for multi-state utilities related to carbon reduction be revised as set forth below:

However, the multi-state utilities **outside of MISO** are encouraged to **develop scenarios that reflect carbon reductions for its respective RTO.** ~~include the provisions included in each scenario.~~ The Commission may request additional information from multi-state utilities prior to approving an IRP pursuant to Section 6t(4) of PA 341. (Pgs. 27- 28)

For Scenarios #1 and #2, I&M suggests removing the reference to multi-state utilities as that wording is provided in the opening paragraph. Also, for Scenario #1, I&M suggest the following to recognize that utility forecasts evaluate various weather extremes:

Using this information, a utility may develop its own demand and energy forecasts with description and detail how its forecast has included the impacts of **extreme weather** ~~climate change~~, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand.

I&M also suggests the following addition:

Natural gas prices utilized are consistent with the Reference Case projections from the United States EIA most recent AEO. **If the utility does not use EIA AEO, then the Natural Gas forecast information must be provided within the utility IRP filing.**

I&M comments that the draft MIRPP embeds an assumption that the load and demand results of a model inherently increase specifically due to EV and electrification and does not allow for counter effects of other economic drivers. I&M expresses concern that this assumes a load forecast and demand forecast increase that will create a conflict with a utility load forecast used in other regulatory filings. I&M therefore suggests the following:

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 three 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 maybe based off the Reference Case in the most recent EIA AEO **or other reputable source for forecasted EV adoption rates.**

I&M recommends the following language be included in the reference to MCL 460.1001.

Not less than 35% of the state's electric needs should be met through a combination of EWR and renewable energy **or zero emitting** resources by 2025, as per MCL 460.1001 (3) **that states "if the investments in energy waste reduction and renewable energy are the most reasonable means of meeting an electric utility's energy and capacity needs relative to other resource options[.]"**

I&M comments that EWR should align with a Market Potential Study (MPS) and suggests the following:

For all in-state electric utilities participating in the State EWR Program, EWR **modeled in the IRP** should be based upon the maximum **achievable potential shown in the state-wide MPS [market potential study] or company sponsored MPS.** ~~allowed under the incentive of 1.5% and should be based upon an average cost of megawatt hour (MWh) saved.~~

I&M suggests the following edits to clarify the expectations for resource costs and performance:

~~Existing renewable energy and storage production tax credits and renewable energy and storage investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.~~

~~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 **and performance** for ~~thermal units and wind~~ track with mid-range industry expectations **consistent with National Renewable Energy Laboratory (NREL) or other publicly available reputable resources.**

Technology costs and limits to the total resource amount available for EWR and DR programs will be informed by the most recently Commission approved state-wide potential study **or company sponsor MPS** and may be augmented by prior EWR and DR potential studies and/or additional research.

~~Technology costs for solar, storage, and other emerging technologies decline with commercial experience consistent with National Renewable Energy Laboratory (NREL) or other publicly available reputable sources.~~

Lastly, for Scenario #1 modeling, I&M seeks clarifications to require a certain threshold be established before special modeling is necessary related to existing Public Utility Regulatory Policies Act of 1978, PL 95–617; 92 Stat 3117 (PURPA) qualifying facilities (QFs).

Regarding Scenario #1 Sensitivities, I&M comments that the following language be included:

1. Fuel cost: 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. **If an alternative gas forecast is used, include a sensitivity with an associated high gas forecast.**

For load projections, I&M offers the following edits:

(a) High load growth: For the filing utility’s load obligation, increase the energy growth rate by at least a factor of two above the base case energy **or consistent with the EIA AEO High Economic growth scenario.** ~~or 0.5% (whichever is larger) on a per customer basis. Adjust demand accordingly.~~ For the region included in the scenario utilize load growth that is consistent with the most recent MISO futures **or the respective RTO for multi-state utilities.**

(b) Low load growth: EV adoption and electrification are slower than expected **and is consistent with the EIA AEO Low Economic growth scenario.** ~~Demand and load growth are consistent with 5-year historical growth rates prior to 2020 and the onset of COVID-19.~~

I&M states that it is committed to modeling all resources on a total basis within the IRP process and suggests the following addition to the Scenario #1 Sensitivities:

If the utility is not already achieving 2% EWR, ramp up the utility’s EWR savings to at least 2.0% of prior year sales over the course of three years within the utility’s Michigan jurisdiction. EWR savings remain at 2% throughout the 20-year study period **except for multi-state utilities that optimize EWR resource selection on a total company basis.**

I&M also recommends the following edits for the sensitivity to be characterized without the presumed results and/or economic drivers:

~~This scenario assumes significant advancements toward electrification that drives a total energy and demand annual growth rates to 1.71% and 1.41% respectively throughout the Eastern Interconnect. Utilities should assume EV adoption reaches 50% of total vehicle sales by 2030 with a trend toward 100% of vehicle sales continues throughout the remainder of the study period.~~ Utilities may develop their own demand and energy forecasts for their service territory with description and detail how their forecast has included the impacts of **extreme weather, climate change**, electrification (**including EVs**), demand side resources, and customer owned distributed generation and how these factors impact overall load and demand.

I&M further comments that the 80% carbon reduction by 2040 reflects a MISO requirement and does not apply to utilities operating in PJM and therefore that specific percentage should be removed from the MIRPP Scenario #1 Sensitivities.

I&M also recommends the following addition to the Sensitivities:

Natural gas prices utilized are consistent with Reference Case projections from the United States EIA's most recent AEO. **If an alternative gas forecast is used, include a sensitivity with an associated high gas forecast.**

I&M comments that the following sensitivity should be removed as the EWR should be based on an MPS.

~~For an electric utility independently administering its own EWR program, maintain a 2% EWR savings. If the utility is not already at 2%, ramp up the utility's EWR savings to at least 2.0% of prior year sales over the course of 3 years, using EWR cost supply curves provided in the 2021 supplemental potential study for more aggressive potential. EWR savings remain at 2% throughout the study period.~~

I&M also suggests the Scenario #1 Sensitivity read, "Achieve and maintain a 50% renewable energy **or zero emission** portfolio by 2030..." to accommodate existing generation.

I&M next suggest edits to clarify IRP modeling related to available incentives follow current law.

~~Existing renewable energy production and storage tax credits and renewable energy and storage investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.~~

I&M also recommends striking the following as it is redundant to the overall IRP approach.



~~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.~~

Next, I&M recommends the following be added:

Technology costs for wind, solar, storage and other renewables decline linearly with commercial experience and forecasted at levels resulting in a 30% reduction from Scenario 1 by the end of the 20-year study period. **All other technologies will utilize publicly available learning curves.**

Technology costs and limits to the total resource amount available for EWR and DR programs will be informed by the most recently Commission approved state-wide potential study wide potential study **or company-sponsor[ed] MPS for multi-state utilities** and may be augmented by prior EWR and DR potential studies and/or additional research.

For Scenario # 2 Sensitivities, I&M first suggests the following addition:

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 Supply forecast natural gas fuel price projections by the end of the 20-year study period. **If an alternative gas forecast is used, include a sensitivity with an associated high gas forecast.**

Assume all coal facilities in **the utility's RTO region in** Michigan are retired by 2030 and Michigan electric sector meets an 80% carbon reduction from the 2005 baseline, modeled as a hard cap on the amount of carbon emissions.

I&M provides that MCL 460.1001 identifies 35% as a goal only if the investments in EWR and renewable energy (RE) are “the most reasonable means of meeting an electric utility’s energy and capacity needs relative to other resource options” and therefore, suggests the following inclusion in the Scenario #2 Sensitivities:

Remove the assumed 50% RPS and assume that not less than 35% of the state’s electric needs should be met through a combination of EWR, and renewable energy **or zero emissions resources** by 2025, as per MCL 460.1001 (3) **that states “if the investments in energy waste reduction and renewable energy are the most reasonable means of meeting an electric utility's energy and capacity needs relative to other resource options”.**

I&M also suggests the following language as the listed requirement should not be applicable to multi-state utilities that optimize EWR resource selection:

For electric utilities independently administering its own EWR program, ramp up to 2.5% EWR savings based upon prior year sales within the utility's Michigan jurisdiction. **This does not apply to multi-state utilities that optimize EWR resource selection.**

For Additional IRP Requirements and Assumptions, I&M recommends adding language to the following that specifies the request:

The capacity import and export limits in the IRP model for the study horizon should be determined in conjunction with the applicable RTOs and transmission owners resulting from the most current and planned transmission system topology. **Staff to advise utility as to which publications contain the current or most recent import and export limits for the applicable RTOs. If applicable to the pricing model,** deviations from the most recently published import and export limits should be explained and justified within the report.

To clarify expectations for resource costs and performance, I&M suggests removing the following:

~~Cost and performance data for all modeled resources, including renewable and fossil fueled resources, storage, energy efficiency and demand response options should be the most appropriate and reasonable for the service territory, region or RTO being modeled over the planning period. Factors such as geographic location with respect to wind or solar resources and data sources that focus specifically on renewable resources should be considered in the determination of initial capital cost and production cost (life cycle/dispatch).~~

I&M also suggests the following edits for Additional IRP Requirements and Assumptions:

Capacity factors should be projected based on demonstrated performance, consideration of technology improvements and geographic/location considerations. **Staff to advise if/how RFP [request for proposal] informed capacity factors to be considered.** Additional requirements for renewable capacity factors are described in the Michigan IRP Modeling Input Assumptions and Sources in the previous section of this draft.

The IRP model should **include** ~~optimize~~ incremental EWR, and renewable energy **and zero emissions resources** to achieve **no less than the 35% of MI Retail Sales** goal. ~~However, the model should not be arbitrarily restricted to a 35% combined goal of EWR and renewable energy. Exceeding the combined EWR and renewable energy goal of 35% by 2025 shall not be grounds for determining that the proposed~~

~~levels of peak load reduction, EWR and renewable energy are not reasonable and cost effective.~~

~~Consider all supply and demand-side resource options on equal merit, allowing for special consideration for instances where a project or a resource need requires rapid deployment.~~

I&M comments that market-wide unit retirement decisions are made when forecasting the broader RTO market and the associated energy and capacity prices, and therefore suggests deleting the following:

~~In modeling each scenario and sensitivity evaluated as part of the IRP process, the utility shall clearly identify all unit retirement assumptions and unless otherwise specified in the required scenarios, the utility has flexibility to allow the model to select retirement of the utility's existing generation resources, rather than limiting retirements to input assumptions.~~

I&M comments that if IRP rules require evaluating early retirement proposals, the early retirement and associated cost recovery should be approved in the IRP along with the plan and resource(s) that will replace it, noting that each retirement situation is different and should be considered within the context of the unique facts and circumstances of the retirement itself. I&M's final recommendations once again seek to clarify expectations for resource costs and performance; I&M therefore, suggests deleting the following:

~~Recognize capacity and performance characteristics of variable resources.~~

~~Recognize the costs and limitations associated with fossil-fueled and nuclear generation.~~

~~Take into consideration existing power purchase agreements, green pricing and/or other programs.~~

#### DTE Electric Company (DTE Electric)

DTE Electric first suggests updates to reflect changes to the environmental regulations referenced in the MIRPP since the draft was proposed in June 2022.

Regarding Scenario #2, DTE Electric comments that it is unclear how the Staff's proposal to model market energy transactions at a carbon intensity consistent with relevant RTO system average is in alignment with using one of the methodologies from the 2019 EPRI carbon accounting methods as specified in the IRP filings. Also, DTE Electric recommends modification of the requirement related to new units being modeled in the local resource zone (LRZ) if under the new construction or with regulatory approval so that it is made clear that this is only for new units in the same LRZ as the utility. DTE Electric also comments that the scenario requirement to achieve and maintain a 50% renewable energy portfolio by 2030 and another 10% from other renewable resources is too aggressive to be feasible and should be removed. Lastly, DTE Electric suggests adding the following to the end of the third paragraph:

Utilities may use the most recent United States Energy Information Administration (EIA) Annual Energy Outlook (AEO) Reference Case 1 or other reputable source for forecasting EV adoption rates. If the utility does not use EIA AEO, then the EV forecast information must be provided in the utility IRP filing.

For Scenario #2 sensitivities, DTE Electric comments that it should be made clear that when modeling an 80% carbon reduction by 2030 that it is modeled fleet emissions rather than based on one of the EPRI carbon accounting or the relevant RTO system average and questions whether this includes purchases and sales. The utility further recommends that the Commission update the sensitivity assumptions to clearly remove the modeled 50% RPS and the 10% from other renewable sources such as VGP and DG.

Regarding Additional IRP Requirements, DTE Electric comments that for #14 the Commission should add "or other analysis" in addition to a net present value of revenue requirement. For #18, the utility suggests limiting this to new resources being considered, revenues from units being considered for retirement, and revenues from existing assets that would significantly change depending on the resulting build plan only.

The Michigan Department of Attorney General and CUB (collectively, AG/CUB)

AG/CUB first comments that the Commission should revisit the MIRPP in July 2024, well before the stated 2027 date, due to many changing factors such as the adoption of the Inflation Reduction Act of 2022 and the Infrastructure Investment and Jobs Act of 2021, as well as impacts from the war in Ukraine, ongoing changes in MISO resource adequacy construct and energy market design, new EPA regulations, and ongoing updates to the MHCP. AG/CUB also comments that a utility should account for known changes in circumstances by making appropriate changes to the assumptions and scenarios, however any changes to the assumptions and scenarios should remain consistent with the Commission's intent when they were adopted. AG/CUB also suggests that scenarios be defined with consideration given to both policy and market factors that affect the whole Eastern Interconnect or the whole relevant RTO. AG/CUB, therefore, recommends that the Commission further divide the scenarios to provide for those considerations. AG/CUB also recommends that the Commission adopt in the MIRPP an expectation that utilities will solicit stakeholder input to develop additional scenarios to model as part of the utility's IRP development.

Regarding EWR and DR, AG/CUB recommends that future potential studies are consistent with cost results that are consistent with Michigan utility experience. AG/CUB recommends that the Commission require utilities to ensure the supply curves or tranches used in their IRP analyses are consistent with their own experience as documented in filed plans and reports. AG/CUB recommends that the Commission require utilities model alternative DR rate designs for each customer class as resources in an IRP, which will allow utilities to develop models of long-term effects of rate design on customer load profiles and allow optimal selection of rate design options. AG/CUB also suggests utilities consider both current rate designs and rate designs that are

intended to strongly signal to customers the times or conditions when power is expensive or that will drive capacity requirements.

AG/CUB believes that, in transmission planning, utilities have limited themselves to current availability or transmission that has been given future consideration by an RTO. AG/CUB contends that IRPs filed to date have not presented results of any modeling that co-optimizes investments in transmission and generation. AG/CUB recommends that utilities be required to fully examine all transmission options that reduce costs related to power supply including resource options located outside of Michigan and even outside of their RTO.

Regarding electrification, load forecasts and balancing resources, AG/CUB first notes that Scenario #1 directs an EV sales path that is much slower than what is likely to occur and that the Commission should update the Scenario to account for recent federal policy changes. AG/CUB also suggests that EV load forecast be based on fleet turnover models and time-of-charging models or scenarios. AG/CUB contends that storage embedded in vehicles presents opportunities for demand response, managed charging, and bi-directional charging which contribute to reliability and that IRPs should include an explicit evaluation of EVs as reliability resources. AG/CUB further recommends that utilities should demonstrate that their modeling of energy storage resources reasonably approximates the full value of storage.

AG/CUB states that limitations on new generation additions adopted by utilities in their modeling predetermine how much renewable generation is selected and therefore those limits should be soundly determined prior to modeling. Therefore, AG/CUB recommends that the Commission require that any renewable generation build limits be supported by direct market evidence in the form of results from RFPs that seek to obtain more renewables than hypothesized by the utilities. AG/CUB further recommends that if a utility presents an IRP where renewable

development is limited by assumed build limits, then those limits should constitute evidence that the utility's PURPA avoided costs for renewables should be based not on the clearing price of renewables in an RFP but rather the cost of non-renewable resources that are selected, or retirement delayed because of assumed build limits. Lastly, AG/CUB recommends that the Commission require utilities to include in their IRPs, consideration of distributed energy as a resource whose supply to the utility will respond to the utility's offers.

#### Clean Grid Alliance (CGA)

CGA first suggests best practices for energy storage to be included in IRPs. CGA comments that energy storage is a scalable and flexible resource that can act in multiple ways, and that modeling needs to account for these attributes as it is used to support generation, transmission, distribution, and end-use operations. At a minimum, CGA recommends that modeling needs to account for frequency regulation and spinning reserves that energy storage can provide. CGA also states that sub-hourly modeling is needed to properly evaluate energy storage's production cost benefits and that for administrative efficiency, modeling may need to be performed for a period of time less than the 20-year period and then extrapolated to and adjusted for the full analysis period.

CGA next suggests that that current transmission parameters fall short of what is required by Act 341. CGA suggests a transmission planning vision longer than four years out so that Michigan has sufficient transmission to meet future generation expansion. CGA continues that generation takes seven to 10 years to plan, approve, and construct and that the IRP needs to evaluate transmission needs 10 to 15 years in the future.

CGA avers there is a disconnect between the Draft Parameters transmission planning provisions and RTO transmission expansion planning and that the Draft Parameters have the utility identify generation expansion 5, 10, 15, and 20 years into the future, but fails to plan for or

guide RTO transmission expansion needed for the renewable resources identified beyond year 10. CGA believes Michigan could close this gap by identifying renewable energy zones that could be used for siting new utility-scale renewable generating plants over the next 10 to 15 years. Zones would be selected based on the quality of the state's wind and solar resources and priorities and inputs into the MISO and PJM transmission planning processes so that RTOs can plan sufficient transmission capacity to be in place by the time new resources are built. CGA cites a similar initiative in Illinois, the Renewable Energy Access Plan (REAP). CGA recommends Michigan's transmission analysis process incorporate objectives similar to those of the REAP relevant for IRP planning and should identify wind and solar zones, helping ensure reliable delivery of, and minimal congestion for, power from new clean energy resources in Michigan to in-state load centers to meet utility IRP needs and state carbon reduction goals.

#### City of Grand Rapids (City of GR)

City of GR first comments that utilities must be required to prioritize all types of resources. City of GR also suggests the Commission require utilities to focus EWR efforts in vulnerable communities and that utilities track, analyze, and publicly report their EWR experience, including projects completed for income-qualified residents, other residential customers, and businesses to be used for future EWR modeling. More specifically, City of GR comments that the Commission should require utilities to include the following data into modeling: (1) which targets/goals achieved based on modeling and compare to state and US greenhouse gas (GHG) emission reduction goals; (2) the GHG emission factors used to calculate current and future estimated emissions for both owned and purchased electricity; (3) the total average megawatt-hour per year (MWh/yr) reduction for EWR, DR, battery storage, and distributed generation (DG) and the total percent supply reduction; (4) the total average MWh/yr increase expected from electrification of



the transportation sector, electrification of buildings and the growth of the economy; (5) estimated EWR achieved due to recently approved building codes estimated to reduce energy consumption by approximately 30% for newly constructed buildings; and (6) reduction in estimated electricity needed for the transportation sector with increased investment in public transit from non-motorized forms of transportation.

City of GR also suggests the Commission require utilities to conduct research and development (R&D) on future issues that will significantly impact the energy sector and require utilities to model how increasing reliability of the grid through DG, EWR, battery storage, and tree trimming will impact supply and consumption. City of GR also comments that utilities should conduct their own environmental justice (EJ) analysis of all programs and include burdens by geographic regions, account type, and income qualifications in modeling and planning.

Additionally, City of GR comments that the Commission should require: (1) that utilities consider how to broaden engagement beyond 12 months prior to the filing of the IRP and require utilities provide accessible engagement opportunities that are focused on vulnerable population and EJ communities; (2) utilities to consider climate science; (3) utilities to research, plan for, and implement end of life processes that are sustainable for all generation types; and (4) utilities to collaborate to understand energy issues across the entire state of Michigan to plan appropriately for supply and consumption.

Environmental Law & Policy Center, Ecology Center, Michigan Environmental Council, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists, and Vote Solar (ELPC *et al.*)

ELPC *et al.* first suggest that additional scenarios with multiple sensitivities be added to the MIRPP with input directly from stakeholders and that the Commission commit to a more robust

stakeholder process in the pre-modeling time frame. ELPC *et al.* suggest should hold at least three stakeholder meetings be held with the ability of any interested person to participate.

ELPC *et al.* next suggest that utilities use the most current data figures whenever possible and the MIRPP should require the use of the most up-to-date data including updated assumptions related to the Inflation Reduction Act. ELPS also supports goals to close coal generation facilities by 2030 but suggest that the MIRPP more overtly include storage targets. ELPC *et al.* states that the Guidehouse Report should only be used as a reference point, not a limit, and that the Commission should require higher levels of EWR savings.

Regarding transmission and planning, ELPC *et al.* support non-transmission alternatives and that MIRPP should require utilities to include MISO Tranche 1 projects and other RTO projects into their analysis. ELPC *et al.* further recommend clarification of load growth projections for EV development. ELPC *et al.* are skeptical that using 5-year historical growth rate and assuming less electrification would produce a materially low sensitivity for all utilities. Lastly, ELPC *et al.* recommend the Commission include improved provisions for DERs and propose DG as a resource model to determine the cost decline for solar required to incent the next block of distributed solar uptake by customers which would help ensure that DERs are considered on a level playing field with other resources.

In its July 7 order, the Commission also provided for reply comments to be filed by October 3, 2022. Reply comments were timely filed by DTE Electric, Consumers, ELPC *et al.*, and jointly from MIEBC/AEE.

### Replies of DTE Electric

DTE Electric first replies that CGA's suggestion to require sub-hourly modeling is problematic because the suggested level of granularity is unclear, it would be extremely time

sensitive to perform modeling over any significant length of time, and extrapolating out into future time periods is not a proper method of analysis. DTE Electric requests the Commission not adopt this recommendation.

DTE Electric next addresses comments from AG/CUB regarding the creation of four new scenarios rather than the two proposed. DTE Electric replies that doubling the number of scenarios imposes an unnecessary burden on modelers and that the scenarios as proposed already account for the MHCP. DTE Electric also replies that AG/CUB's suggestion to model alternative rate designs as resources is not practical because rate design is determined in rate cases and would only add additional work for modelers. DTE Electric also replies that RFPs are required by statute only if there is a need within the first three years of the IRP, and therefore, AG/CUB's recommendation that any new renewable generation build limits be supported by the results of RFPs should be rejected. DTE Electric also replies that the Commission should reject AG/CUB's recommendation to apply PURPA avoided costs for renewables if a utility presents an IRP with build limits for renewable development because build limits included in an IRP have nothing to do with capacity need or economic selection of resources that would trigger capacity need under PURPA. Finally, DTE Electric asks the Commission to reject AG/CUB's recommendation to include smaller scale distributed resources both interconnected and behind-the-meter as this suggestion is outside the scope of the IRP and unnecessary since utilities already have standard contracts for QFs pursuant to PURPA, and smaller-scale behind-the-meter distributed resources are already considered since they reduce a utilities' load.

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Replying to ELPC *et al.*, DTE Electric first replies that the Commission should reject ELPC *et al.*'s proposed DER model on the basis that expanding the contribution of DERs in capacity planning requires more examination before it can be applied in filing requirements.

DTE Electric next addresses MEIBC/AEE's recommendation to add advocacy resources to the MIRPP modeling input assumptions and states these groups have their own agenda for EVs that are not widely accepted in the industry. DTE Electric supports the continued use of industry-approved generic resources for EV modeling assumptions and sources. Additionally, DTE Electric believes that the clarification of the slow growth projections for EV adoption proposed by various commenters is not necessary, and the sensitivity should be removed.

#### Replies of Consumers

Consumers first replies to MEIBC/AEE's suggestion to use the MHCP's storage target of 4000 MW of storage by 2040 and objects to the recommendation because the company is not supportive of any required specific technology without the appropriate justification. Consumers also objects to a required best practice for modeling of any specific technology. Additionally, Consumers objects to MEIBC/AEE's proposal to include a sensitivity in Scenario #2 for atypical weather of 1-in-10 year as Scenario #2 already indicates that a utility must support its load forecast that includes the impact of climate change. Lastly, Consumers replies to MEIBC/AEE's recommendation that EVs should be modeled as sources of generation and storage in the MIRPP and that they are concerned that the parameters do not capture vehicle-to-grid (V2G). Consumers seeks clarification on the level of V2G availability proposed and when that resource would be cost-effective. Consumers comments that the proposal to include much of the Energy Storage Roadmap into the MIRPP is inappropriate.

Consumers also replies that AG/CUB's recommendation to create four scenarios to replace the current two scenarios is unnecessary. Consumers also questions AG/CUB's recommendation for utilities to solicit participating stakeholders to define a scenario in modeling in IRP development and provides that the proposed filing requirements already include a section for stakeholder engagement, and that Consumers has participated in seven stakeholder workgroup sessions that addressed potential changes to the MIRPP.

Consumers replies that AG/CUB's recommendation that utilities should be considering the incentive effect of rate design, as well as the cost of service aspect of rate design when considering DR is unnecessary, and further objects to the recommendation for utilities to model rate design for each customer class as resources in an IRP as rate design and cost of service are issues for rate cases. Consumers also objects to the AG/CUB's comment that utilities examine transmission options to reduce costs of power supply, replying that transmission planning is a lengthy process that does not fit within the IRP timing constraints.

Consumers next replies that AG/CUB's recommendation that the Commission require utilities to model energy storage resources in a manner that approximates the full value of storage is unclear and because the MIRPP already requires energy storage modeling. Finally, Consumers objects to AG/CUB's recommendation that renewable energy build limits be supported by direct market evidence in the form of RFPs on the basis that, assuming all projects offered in an RFP could be built simultaneously, would lead to a gross over estimation of the capacity that could be built in single year.

Consumers next addresses ABATE's suggestion that a utility's best estimate of operating conditions and regulatory environment be a scenario and replies that a new scenario is unnecessary because utilities are likely to assume those conditions as business as usual in base case assumption.

And finally, Consumers objects to the late filing of ELPC *et al.*'s initial comments and recommends the Commission reject those comments and any suggested changes to the MIRPP.

#### Replies of MEIBC/AEE

MEIBC/AEE first replies that it supports the position of ACEEE regarding not locking-in flawed EWR and DR assumptions for five years, and further supports the position of AG/CUB that stakeholder engagement in defining scenarios should be required. MEIBC/AEE also agrees with AG/CUB to adopt a requirement that every utility take the approach of soliciting participating stakeholders to define a scenario that the utility then models as part of its IRP development, and that EWR and DR potential cost studies include, at a minimum, those that are consistent with Michigan utility experience, and that renewable energy generation build limits be supported by direct market evidence in the form of RFPs. MEIBC/AEE further replies that it agrees with AG/CUB's recommendation that IRPs include an explicit evaluation of EVs as reliability resources and the inclusion of details related to EV adoption assumptions and impacts to overall peak demand forecasts. MEIBC/AEE further replies in support of modeling the full value of storage as suggested by AG/CUB. MEIBC/AEE agrees with ELPC *et al.* that IRPs should utilize the most up-to-date sources and be flexible enough to include those sources, and that DERs should be modeled as supply-side resources.

MEIBC/AEE disagrees with Consumers' suggested reduction of EWR assumption levels to 1% and supports the inclusion of a 2% assumption for EWR in both Scenarios. MEIBC/AEE also disagrees with DTE Electric's recommendation to remove language in the MIRPP requiring utilities to achieve and maintain a 50% renewable energy portfolio by 2030 and another 10% from other renewable energy resources as not only is this scenario requirement feasible but it is likely DTE Electric will need it to meet its stated clean energy and carbon reduction goals.

MEIBC/AEE also disagrees with several recommendations proposed by I&M.

MEIBC/AEE challenges I&M's proposal regarding scenarios that include announcements and retirement assumptions, its suggestion to replace "climate change" with "extreme weather," its proposal to utilize its own forecasts and studies and replies that it supports the standardization of forecasts tools for all IRPs, and its proposed insertion of the phrase "zero-emitting resources" into the IRP Filing Requirements and Planning Parameters, responding that this phrase is not in statute. MEIBC/AEE also strongly disagrees with I&M's recommendation to remove energy storage modeling requirements and replies that utilities must remain flexible and fully able to assess the value of storage to the grid.

Replies of ELPC *et al.*

ELPC *et al.* reply that the Commission should reject Consumers proposed reduction to a 1% EWR assumption level for Scenario #1 and that the scenario should reflect current and ongoing actions and trends of utilities. ELPC *et al.*, however, agrees with Consumers' recommendation to remove the low load growth sensitivity in Scenario #1. ELPC *et al.* reply that the MHCP's power sector goals are critical to the state's overall efforts to reduce carbon emissions, and therefore disagrees with DTE Electric's recommendation to remove the goal of 60% renewable energy by 2030. ELPC *et al.* also find I&M's suggestion to replace "climate change" with "extreme weather" should be rejected as those terms are not synonymous and the Commission should strive to keep the proper context on climate change as a whole. Lastly, ELPC *et al.* recommend rejecting any attempt by I&M to dilute planning parameters for modeling EWR.

## Discussion

The Commission would first like to thank and acknowledge the hard work of the Staff, the utilities, and the many other stakeholders that participated in the Advanced Planning Phase III portion of the Integration of Resource, Transmission, and Distribution Planning MI Power Grid workgroup that provided input on the redline MIRPP. It is vital to Michigan's energy future that the Commission receives input from a diverse and energetic range of stakeholders in the continued development of MIRPPs to ensure Michigan's regulatory framework continues to keep pace with the changes occurring in the energy sector. Towards that end, the Commission notes that the redline MIRPP includes two modeling scenarios and sensitivities combinations, with each combination representing a different vision for Michigan's energy future.

Scenario #1 assumptions include a decline in carbon dioxide emissions, modest EV growth, and modest advancements toward electrification. Scenario #1 Sensitivities include high fuel costs, high load projections, and 2% EWR savings.

Scenario #2 is more aggressive and assumes significant electrification advancements, high load growth to support electrification, and achievement of all announced GHG reductions. Scenario #2 Sensitivities include both high and low fuel costs, an assumption that all Michigan coal facilities will be closed by 2030, and 2.5% EWR savings.

The Commission greatly appreciates those providing comments in this docket and at the two public hearings regarding the MIRPP redline and associated scenarios and sensitivities. The Commission will address those comments as they pertain to the nine specific sections of the MIRPP and as incorporated into the MIRPP, attached as Exhibit A, where associated revisions have been made to the document.



First, no significant edits were made to Sections I and II, Executive Summary and Background, respectively, and therefore the Commission finds that it is unnecessary to address any associated comments and adopts the minor edits in these sections as written in the updated MIRPP.

Regarding Section III, Energy Waste Reduction Potential Study, the redline MIRPP includes an overview of the statewide assessment of EWR potential conducted by Guidehouse for both electric and natural gas in the entire state of Michigan. Section IV, Demand Response Study, was also conducted by Guidehouse in conjunction with the EWR potential study with the objective of estimating the potential for cost-effective DR as a capacity resource to reduce customer load during peak summer hours in Michigan from 2021-2040. ACEEE is concerned with the reliance solely on Guidehouse to “inform” on EWR goals and suggests adding “**help**” to Exhibit A on page 5. The Commission disagrees that the change is necessary. The Commission, however, does appreciate Consumers’ concerns regarding the reference to 2040 as the study end date as the EWR study period extends beyond that date; however, the title of the potential study produced by Guidehouse will remain. No other significant adjustments were made to either Section III or Section IV and therefore the Commission adopts those provisions as shown in Exhibit A, pp. 4-7.

In Section V, State and Federal Environmental Regulations, Laws and Rules, the Commission notes several updated provisions since the redline MIRPP was filed, based on consultation with EGLE. First, in the subsection, Sulfur Dioxide Nonattainment Areas, the following revisions were made:

~~USEPA is working to complete the FIP and expects that it will be available for public comment sometime in summer of 2022. Following the approval of the FIP, EGLE will work to incorporate its provisions into the SO<sub>2</sub> SIP. Once all the elements of the SIP have been implemented, EGLE plans to pursue a redesignation request for southern Wayne County.~~

**USEPA completed the FIP [federal implementation plan] and a public comment period was held during June and July 2022. EGLE anticipates the finalization of the FIP during fall 2022 and is working to incorporate its provisions into an SO<sub>2</sub> SIP [state implementation plan]. Once all of the elements of the SIP have been implemented, EGLE plans to pursue a redesignation request for southern Wayne County.**

And also,

~~Upon shutdown of the St. Clair Power Plant in May 2022, EGLE expects to submit a redesignation request to USEPA for the St. Clair County nonattainment area as well.~~

**EGLE has begun working on a SIP submittal to pursue redesignation for the St. Clair County non-attainment area following the shutdown of the St. Clair Power Plant in May 2022.**

Next, for Ozone Nonattainment Areas, the Commission also adds the following:

**On October 7, 2022, USEPA issued its final determinations of attainment by the attainment date and reclassifications of areas classified as marginal for the 2015 ozone NAAQS [National Ambient Air Quality Standards]. USEPA’s final determination reclassified the three western nonattainment counties from marginal to moderate nonattainment. EGLE is currently working on an attainment SIP for those areas and expects to submit sometime in early 2023. USEPA did not include the seven-county southeast Michigan nonattainment area in this final determination and reclassification but indicated that they would act on that area in a separate action.**

Exhibit A, p. 11.

For subsection Mercury and Air Toxic Standards, footnotes 7 and 8 have been deleted.

Additionally, due to recent decisions reached by the United States Supreme Court, the following revisions are required:

~~The Supreme Court is expected to heard the four combined cases in its current term with a ruling expected in late spring or early summer 2022~~ **on February 28, 2022 and the case was decided on June 30, 2022. While the Court did indicate that including generation shifting (away from coal to cleaner forms of energy generation) as the BSER [Best System of Emission Reduction] would inappropriately transform USEPA’s authority from reducing pollution to setting the national generation mix, it also clarified that USEPA can regulate the power sector. The Court relied on the “major questions” doctrine which holds that courts should not defer to agencies on matters of “vast economic or political significance” unless Congress has explicitly given the agencies the**

**authority to act in those situations thus limiting the power of the USEPA (and other agencies) in the absence of a clear congressional mandate to do so.**

Exhibit A, pp. 15-16. The Commission also acknowledges the following added update to the last paragraph:

**In addition, USEPA has announced plans to propose new carbon reduction regulations for existing power plants in spring 2023 and is holding meetings with stakeholders to help inform that proposal.**

*Id.* Revisions for redundancies are also included in subsection Solid Waste Management (Part 115). First, on page 24 of Exhibit A, ~~“In 2018, Part 115 was amended to include the majority of the RCRA rule, including the regulation of CCR surface impoundments used for storage”~~ is deleted. Next, the Commission adds Water Quality Based Effluent Limits for Toxic Substances (Part 8) as a subsection with the following also included:

**Michigan’s Part 8 Rules, Water Quality-Based Effluent Limit Development for Toxic Substances are used to establish toxic substance water quality based effluent limits (WQBELs) for point source discharges that are protective of the designated uses of the surface waters of the state. Part 8 includes provisions for establishing total maximum daily loads, wasteload allocations for toxic substances, reasonable potential for chemical specific WQBELs, and calculating WQBELs that are less than the quantification level.**

**To achieve compliance with the low WQBELs (those that are less than the quantification level) and associated regulatory requirements, the department encourages, the use of pollution prevention, source control, and other waste minimization programs. End-of-pipe treatment for the low WQBELs which is extraordinary or beyond that which would be necessary if not for the low WQBELs is not required by the department unless it is determined to be the most cost-effective means or the only means to achieve the applicable water quality-based effluent limit.**

*Id.*, pp. 24-25. The Commission acknowledges the invaluable assistance from EGLE in drafting and finalizing Section V and adopts the strike/bold revisions to the redline MIRPP as shown in Exhibit A. The Commission also notes that Appendix E of the final MIRPP, Exhibit B, contains a regulatory timeline of the applicable environmental regulations, laws, and rules, which are also

adopted. The Commission also notes the deletion of footnotes 9, 10, and 11 in Section VI, Planning Reserve Margins and Local Clearing Requirements from the MIRPP redline.

Section VII, Modeling Scenarios, Sensitivities and Assumptions, is the source for most of the comments and replies filed in this docket. The Commission notes that Act 341 explicitly excludes multi-state utilities from the requirement to model the outlined scenarios but those utilities, nevertheless, are encouraged to include the outlined provisions in each scenario when modeling. AG/CUB recommends subdividing Scenarios #1 and #2 into each modeling based on current law, and based on full implementation of the MHCP. The Commission agrees with both Consumers and DTE Electric that the recommendation is unnecessary as adding two new scenarios would create extra burdens and costs on utilities without providing sufficient additional benefit to justify these burdens and costs. Consumers and DTE Electric also question AG/CUB's recommendation for utilities to solicit participating stakeholders to define a scenario in modeling in IRP development and provides that the proposed filing requirements already include a section for stakeholder engagement, and that Consumers has participated in seven stakeholder workgroup sessions that addressed potential changes to the MIRPP. The Commission finds that this issue is best reserved for a full discussion at a later date.

Scenario #1 aligns with MISO's December 2021 Futures report, Future 1, and reflects substantial achievement of state and utility announcements including generation retirements and environmental goals. Consumers is in support of Scenario #1 provisions but suggests the following language in bold be included in the subsection:

For the utility performing the analysis, the generation unit retirement assumptions may vary for only the generation units **for which** the utility has decision making authority **or for any unit retirements that have been publicly announced since publication of the MISO report. The filing utility may incorporate more recently announced retirements if practical.**

Exhibit A, p. 28. The Commission agrees that the language aligns with MISO Future 1 and therefore incorporates the language into the final MIRPP. Also in Scenario #1, the Commission notes minor changes to the language in Exhibit A on pages 30-32 and adopts those edits into the final MIRPP. These minor changes include: (1) In bullet two, inclusion of the word “MISO,” to read: Moderate EV adoption and customer electrification result in moderate **MISO** footprint-wide demand and energy growth; and (2) inclusion of the word “utility,” to read: **Utility** 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. Next, the Commission agrees with comments related to energy storage resources and includes the following:

Allow for multiple market revenue streams where applicable **and demonstrate the utility is reasonably capturing the full value of storage.**

Exhibit A, p. 31.

AG/CUB recommend that any new renewable generation build limits be supported by direct market evidence in the form of RFPs, and that if a utility presents an IRP that limits renewable energy by assumed build limits, then that constitutes evidence for new cost of non-renewable resources under PURPA. The Commission agrees with DTE Electric’s opposition to these recommendations and declines to adopt them.

Also, for Scenario #1, MEIBC/AEE suggests a new bullet point for EV adoption reaching 50% of total vehicle sales by 2030 and a continuing trend towards 100% of vehicle sales. The Commission finds MEIBC/AEE’s recommendation unnecessary, and that modeling should assume EV load from MISO Future 1.

For Scenario #1 Sensitivities, Consumers expressed concern over the “low load growth” sensitivity and recommends removal. The Commission, however, finds that no changes are

necessary to this sensitivity. The Commission does agree with Consumers to strike the reference to the 20-year study period for EWR potential savings sensitivity.

Scenario #2 aligns with Future 3 included in MISO’s December 2021 Futures Report and assumes significant advancement towards electrification that drives total energy and demand annual growth rates to 1.71% and 1.41%, respectively throughout the Eastern Interconnect. The Scenario #2 assumptions incorporate 100% of utility IRPs and that 100% of announced state and utility goals are met. The Scenario further incorporates the retirement announcements throughout the MISO footprint and that EV adoption reaches 50% of total vehicle sales by 2030 with a trend toward 100% of vehicle sales continuing throughout the remainder of the study period, **consistent with the MHCP goals.** See, Exhibit A, p. 33. The Commission also added language to the next paragraph in Exhibit A regarding emissions declines for non-MISO portions of Michigan so that, **“If PJM provides no set goal, then utilities shall utilize carbon reduction goals set by their respective corporate entity.”**

At the request of DTE Electric, the Commission has rewritten the fourth bullet point, Exhibit A, p. 34 to read:

Specific new units are modeled in the LRZ if under construction or with regulatory approval (i.e., IRP cost pre-approval, CON, signed [generator interconnection agreement], **Renewable Energy Plan, or Voluntary Green Pricing Plan**) for **units in the utility’s resource zone only (i.e., DTE Electric’s LRZ is MISO Zone 7).**

Additionally, on the recommendation from MEIBC/AEE regarding modeling energy storage resources, the Commission adds **“and demonstrate the utility is reasonably capturing the full value of storage”** to the end of the seventh bullet. *Id.*, p. 35. The Commission also agrees that technology costs and limits to the total resource amount available for EWR and DR programs will be informed by the most recently Commission-approved statewide potential study and may be

augmented by prior EWR and DR potential studies and/or additional research **as well as by the actual experience of EWR programs in Michigan.** *Id.* The Commission also agrees to include a final Scenario #2 assumption that reads “**Storage should be modeled assuming MI Healthy Climate Plan statewide goals are achieved on a utility load share basis.**” *Id.*, p. 36.

MEIBC/AEE comments that to account for atypical weather conditions, Scenario # 2 should require modeling the impact of atypical weather conditions that occur at least as frequently as once in ten years, either via a load forecast adjustment or a stochastic analysis of weather risks. The Commission, however, notes that the suggested language is appropriately covered in the IRP filing requirements.

For Scenario #2 Sensitivities, the Commission finds that (3) should be edited to “**Assume 10% from other renewable resources such as voluntary green pricing and distributed generation remains.**” *Id.* The Commission is also satisfied that ramping up to 2.5% EWR savings for electric utilities independently administering their own EWR programs is appropriate for the Scenario #2 sensitivity and therefore rejects ACEEE’s recommendation to model a higher EWR savings.

Section VIII “Michigan IRP Modeling Input Assumptions and Sources” includes charted IRP modeling input assumptions that should be used in conjunction with the description of the scenarios and sensitivities. The Commission notes several edits to “9-EWR Savings” so that the values align with the proper scenario or sensitivity.

The final Section, “IX. Additional IRP Requirements and Assumptions,” requires modification to reduce redundancies within the redline MIRPP and to align with the updated IRP filing requirements order being issued in coordination with the adoption of the final MIRPP in this

order. Therefore, the Commission has deleted Section IX numbers (1), (3)-(5), (8), (11), and (14)-(17) from the MIRPP redline as shown below.

~~1. Utility-specific assumptions for discount rates, weighted average cost of capital and other economic inputs should be justified and the data shall be made available to all parties.~~

~~3. The capacity import and export limits in the IRP model for the study horizon should be determined in conjunction with the applicable RTOs and transmission owners resulting from the most current and planned transmission system topology. Deviations from the most recently published import and export limits should be explained and justified within the filing report.~~

~~4. Environmental benefits and risk must be considered in the IRP analysis as specified in the Michigan Integrated Plan Filing Requirements.~~

~~5. Cost and performance data for all modeled resources, including renewable and fossil fueled resources, storage, energy efficiency and demand response options should be the most appropriate and reasonable for the service territory, region or RTO being modeled over the planning period. Factors such as geographic location with respect to wind or solar resources and data sources that focus specifically on renewable resources should be considered in the determination of initial capital cost and production cost (life cycle/dispatch).~~

~~8. The IRP model should optimize incremental EWR and renewable energy to achieve the 35% goal. However, the model should not be arbitrarily restricted to a 35% combined goal of EWR and renewable energy. Exceeding the combined EWR and renewable energy goal of 35% by 2025 shall not be grounds for determining that the proposed levels of peak load reduction, EWR and renewable energy are not reasonable and cost effective.~~

~~11. Consider including transmission assumptions in the IRP portfolio, such as the impact of transmission and non-transmission alternatives (local transmission, distribution planning, locational interconnection costs, environmental impacts, right of way availability and cost) to the extent possible.~~

~~14. To the extent that the utility is proposing early retirement of a generation facility (retirement that results in an undepreciated plant balance and prior to the end of the assumed useful life), the utility should present a Net Present Value Revenue Requirement (NPVRR) analysis that compares various financing options.~~

~~15. Recognize capacity and performance characteristics of variable resources.~~

~~16. Recognize the costs and limitations associated with fossil-fueled and nuclear generation.~~



~~17. Take into consideration existing power purchase agreements, green pricing and/or other programs.~~

### Conclusion

Act 341 specifically requires utilities to file IRPs as part of their respective long-range planning for delivering electricity to their customers. Additionally, a utility's IRP should demonstrate how it will provide reliable, cost-effective electricity while addressing the risks and uncertainties inherent in the utility industry. Following the initial filing of its IRP, a utility is required under Act 341 to file an updated IRP every five years thereafter with a planning horizon of 5, 10, and 15 years out. As part of the IRP, a utility is also required to include modeling scenarios and sensitivities with each combination representing a different vision for the future. Towards that end, the Commission finds that the final MIRPP adopted in this order represents a collaborative effort of a diverse, knowledgeable, and energetic stakeholder workgroup that will have a lasting positive influence on Michigan's energy future.

THEREFORE, IT IS ORDERED that:

A. The revisions to the redline version of the Michigan Integrated Resource Planning Parameters are approved, and the Commission adopts the Michigan Integrated Resource Plan Parameters, attached as Exhibit A.

B. All Michigan electric utilities whose rates are regulated by the Commission shall demonstrate modeling scenarios and sensitivities in accordance with the Michigan Integrated Resource Planning Parameters, attached as Exhibit A, in their respective integrated resource plan filings.

C. This order applies to utilities filing integrated resource plans on or after November 21, 2022.

The Commission reserves jurisdiction and may issue further orders as necessary.

Any party desiring to appeal this order must do so in the appropriate court within 30 days after issuance and notice of this order, pursuant to MCL 462.26. To comply with the Michigan Rules of Court's requirement to notify the Commission of an appeal, appellants shall send required notices to both the Commission's Executive Secretary and to the Commission's Legal Counsel. Electronic notifications should be sent to the Executive Secretary at [mpscedockets@michigan.gov](mailto:mpscedockets@michigan.gov) and to the Michigan Department of Attorney General - Public Service Division at [pungpl@michigan.gov](mailto:pungpl@michigan.gov). In lieu of electronic submissions, paper copies of such notifications may be sent to the Executive Secretary and the Attorney General - Public Service Division at 7109 W. Saginaw Hwy., Lansing, MI 48917.

MICHIGAN PUBLIC SERVICE COMMISSION

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Daniel C. Scripps, Chair

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Tremaine L. Phillips, Commissioner

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Katherine L. Peretick, Commissioner

By its action of October 27, 2022.

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Lisa Felice, Executive Secretary

# MICHIGAN INTEGRATED RESOURCE PLANNING PARAMETERS - DRAFT

Pursuant to Public Act 341 of 2016, Section 6t

June 30, 2022 October 27, 2022

## Table of Contents

I.	Executive Summary.....	2
II.	Background.....	3
III.	Energy Waste Reduction Potential Study.....	4
IV.	Demand Response Potential Study.....	6
V.	State and Federal Environmental Regulations, Laws and Rules.....	7
VI.	Planning Reserve Margins and Local Clearing Requirements .....	25
VII.	Modeling Scenarios, Sensitivities and Assumptions.....	27
VIII.	Michigan IRP Modeling Input Assumptions and Sources..	37
IX.	Additional IRP Requirements and Assumptions .....	39
	Appendix B: Map of MISO Local Resource Zones	<b>Error! Bookmark not defined.</b>
	Appendix C: Map of PJM Local Deliverability Areas	<b>Error! Bookmark not defined.</b>
	Appendix D: Public Act 341 of 2016, Section 6t (1)	<b>Error! Bookmark not defined.</b>
	Appendix E: Environmental Regulatory Timeline	<b>Error! Bookmark not defined.</b>



## I. Executive Summary

This Michigan Integrated Resource Planning Parameters (MIRPP) document was developed as a part of the implementation of the provisions of Public Act 341 of 2016 (PA 341), Section 6t. This document includes two integrated resource plan (IRP) modeling scenarios with multiple sensitivities per scenario for the rate-regulated utilities in Michigan's Upper and Lower Peninsulas. None of the scenarios, sensitivities or other modeling parameters included within this document should be construed as policy goals or even as likely predictions of the future. Instead, the scenarios, sensitivities and modeling parameters are more aptly characterized as stressors utilized to test how different future resource plans perform relative to each other with respect to affordability, reliability, adaptability, and environmental stewardship. In some instances, scenarios and sensitivities intentionally push the boundaries on what may be viewed as probable and could be considered as bookends on the range of possible future outcomes. Utilities may also include separate additional scenarios and sensitivities in IRPs and may use different assumptions or forecasts for the additional scenarios and sensitivities. However, the assumptions and parameters outlined in this document should be used for the required scenarios and sensitivities. Including the scenarios will ensure that Michigan's electric utilities will consider a wide variety of resources such as renewable energy, demand response (DR), energy waste reduction (EWR), storage, distributed generation technologies, voltage support solutions, and transmission and non-transmission alternatives, in addition to traditional fossil-fueled generation alternatives for the future. This IRP parameters document also contains numerous modeling assumptions and requirements, requires sensitivities for each scenario, identifies significant environmental regulations and laws that effect electric utilities in the state, and identifies required planning reserve margins and local clearing requirements (LCRs) in areas of the state.

The DR and EWR Potential Studies were completed August of 2021. Both studies have an influence on integrated resource planning and are incorporated into the Commission's October 27, 2022 order in Case No. U-21219 for the 5-year update pursuant to PA 341 Section 6t.

Section 6t (1) requires that the IRP parameters, required modeling scenarios and sensitivities, applicable reliability requirements, applicable environmental rules and regulations, and the DR and EWR potential studies be re-examined every five years. This is the first 5-year update. The next 120-day proceeding to conduct these assessments and gather input should commence in July 2027.

## **II. Background**

On December 21, 2016, PA 341 was signed into law, which amended PA 3 of 1939 and became effective on April 20, 2017. The law requires the Michigan Public Service Commission (MPSC or Commission), with input from the Michigan Agency for Energy (MAE), Michigan Department of Environmental Quality (MDEQ), and other interested parties to set modeling parameters and assumptions for utilities to use in filing IRPs. PA 341 then requires rate-regulated electric utilities to submit IRPs to the MPSC for review and approval.

At the conclusion of a stakeholder process and issuance of draft MIRPP, the Commission adopted the MIRPP on November 21, 2017, in Case No. U-18418.

Pursuant to PA 341, the MPSC and the Department of Environment, Great Lakes, and Energy (EGLE) began a second collaborative process as part of MI Power Grid Phase II – Integration of Resource/Distribution/Transmission Planning on September 24, 2020, with state-wide participation from a wide-range of stakeholders (listed in Appendix A). On October 29, 2020, the Commission issued an order in Case No. U-20633 directing Staff to also work with stakeholder groups to determine how to update IRP planning parameters and filing requirement to take into account the goals set by Michigan's utilities and how these goals align with the greenhouse gas emissions targets set by

Governor Whitmer. Stakeholder sessions discussed many aspects of PA 341 Section 6t including:

- i. Environmental Policy
- ii. Forecasting
- iii. Transmission
- iv. The Regional Energy Market
- v. Distributed Energy Resources
- vi. Economic valuation
- vii. Generation Diversity
- viii. Risk Assessment

Stakeholders were invited to participate by providing comments and feedback during and after every stakeholder session met regularly from December 2021 to late April 2022 to discuss how to update various subsections of PA 341 Section 6t. Further details on the stakeholder sessions are included on the MPSC's web page for Phase III of the MI Power Grid initiative.<sup>1</sup>

Future outreach efforts will be summarized here upon document finalization.

### **III. Energy Waste Reduction Potential Study**

*To comply with PA 341 Section 6t (1) (a) and (f) (iii)*

The statewide assessment of EWR potential was conducted by Guidehouse Inc. (Guidehouse) for electricity and natural gas for the entire State of Michigan. This study's objective was to assess the potential in the residential, commercial, and industrial sectors, with the addition of small commercial, multi-family, and low-income segments, by analyzing EWR measures and improvements to

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<sup>1</sup> [https://www.michigan.gov/mpsc/0,9535,7-395-93307\\_93312\\_93320-508709--,00.html](https://www.michigan.gov/mpsc/0,9535,7-395-93307_93312_93320-508709--,00.html).



end-user behaviors to reduce energy consumption. Measure and market characterization data was input into Guidehouse's Demand Side Management Simulator (DSMSim™) model, which calculates technical, economic, and achievable potential across utility service areas in Michigan for more than 600 measure permutations. Results were developed and are presented separately for the Lower and Upper Peninsulas. These results will be used to inform EWR goal setting and associated program design for the MPSC.<sup>2</sup>

[Scenario #1](#): Reference– Estimates of achievable potential calibrated to 2021 total program expectations and refined using relative savings percentages at the end use and high impact measure-level with 2019 actual achievements. Key assumptions include non-low-income measure incentives of 40% of incremental cost (low-income segments incentivized at 100% of incremental cost) and administrative costs representing 33% of total utility program spending.

[Scenario #2](#): Aggressive– Increased measure incentives and marketing factors and decreased program administrative costs. Analyzed measure incentive levels to determine the 1.0 Utility Cost Test (UCT) ratio tipping point. Developed measure-level incentive estimates based on these results and adjusted where necessary to ensure program-level cost effectiveness. Increased marketing factors above calibrated values for specific end use and sector combinations.

[Scenario #3](#): Carbon Price– Acknowledging the regulatory uncertainty around carbon price legislation, provides a high-level fuel cost adder, ramping up through time as the probability of regulatory action increases. This scenario provides insight into the sensitivity of EWR savings potential to avoided costs. Due to the uncertain nature of carbon pricing legislation, the scenario is not related to specific program or policy recommendations. Increased electricity

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<sup>2</sup> MI EWR Potential Study [MI EWR Statewide Potential Study \(2021-2040\) Combined \(michigan.gov\)](#), Retrieved December 8, 2021.

(\$/MWh) and natural gas (\$/therm) avoided costs by 50% in 2021, escalating with a 2.5% multiplier growth until a 100% increase was met.

## **IV. Demand Response Potential Study**

*To comply with PA 341 Section 6t (1) (b)*

The MPSC issued a request for proposal for the DR potential study<sup>3</sup> in May of 2020. Bids were received and evaluated and a contract for the study was awarded to Guidehouse in August of 2020. The DR potential study assessed DR potential in Michigan from 2021 to 2040 and was conducted in conjunction with the EWR potential study. The DR potential study was completed in September of 2021.

The objective of the DR potential assessment was to estimate the potential for cost-effective DR as a capacity resource to reduce customer loads during peak summer periods. Additionally, the study assessed electric winter peak reduction potential and natural gas DR potential. DR potential estimates were developed for both the Lower Peninsula and the Upper Peninsula.

The DR potential and cost estimates were developed using a bottom-up analysis. The analysis used customer and load data from Michigan utilities for market characterization, customer survey data to assess technology saturation and customer willingness to enroll in DR programs, DR program information from Michigan utilities, the latest available information from the industry on DR resource performance and costs. These sources provided input data to the model used to calculate total DR potential across Michigan.

The DR potential study was a collaborative process wherein the MPSC, Guidehouse, and stakeholders worked together to ensure the study reflected current Michigan market trends. Three virtual stakeholder meetings were held

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<sup>3</sup> [https://www.michigan.gov/mpsc/0,9535,7-395-93308\\_94792-552726--,00.html](https://www.michigan.gov/mpsc/0,9535,7-395-93308_94792-552726--,00.html)

during the study which provided stakeholders with an update on study progress and an opportunity to provide feedback to Guidehouse and MPSC Staff.

## **V. State and Federal Environmental Regulations, Laws and Rules**

Appendix E contains a regulatory timeline of the environmental regulations, laws and rules discussed in this section.

### [Section 460.6t \(l\) \(c\)](#)

*To comply with PA 341 Section 6t (l) (c)*

Federal rules and laws:

[Clean Air Act](#) – The Clean Air Act (CAA) is a United States federal law designed to control air pollution on a national level. The CAA is a comprehensive law that established the National Ambient Air Quality Standards (NAAQS), Maximum Achievable Control Technology Standards (MACT), Hazardous Air Pollutant Standards, and numerous other regulations to address pollution from stationary and mobile sources.

[National Ambient Air Quality Standards](#) – Title 1 of the CAA requires the United States Environmental Protection Agency (USEPA) to set NAAQS for six criteria pollutants that have the potential of harming human health or the environment. The NAAQS are rigorously vetted by the scientific community, industry, public interest groups, and the public. The NAAQS establish maximum allowable concentrations for each criteria pollutant in outdoor air. Primary standards are set at a level that is protective of human health with an adequate margin of safety. Secondary standards are protective of public welfare, including protection from damage to crops, forests, buildings, or the impairment of visibility. The adequacy of each standard is to be reviewed every

five years. The six criteria pollutants are carbon monoxide, lead, ozone, nitrogen dioxide, particulate matter, and sulfur dioxide (SO<sub>2</sub>).<sup>4</sup>

Nonattainment areas are regions that fail to meet the NAAQS. Locations where air pollution levels are found to contribute significantly to violations or maintenance impairment in another area may also be designated nonattainment. These target areas are expected to make continuous, forward progress in controlling emissions within their boundaries. Those that do not abide by the CAA requirements to reign in the emissions of the pollutants are subject to USEPA sanctions, either through the loss of federal subsidies or by the imposition of controls through preemption of local or state law. States are tasked with developing strategic plans to achieve attainment, adopting legal authority to accomplish the reductions, submitting the plans to the USEPA for approval into the State Implementation Plan (SIP), and ensuring attainment occurs by the statutory deadline. States may also submit a plan to maintain the NAAQS into the future along with contingency measures that will be implemented to promptly correct any future violation of the NAAQS.

**Sulfur Dioxide Nonattainment Areas** – In 2010, the USEPA strengthened the primary NAAQS for SO<sub>2</sub>, establishing a new 1-hour standard of 75 parts per billion (ppb).

A federal consent order set deadlines for the USEPA to designate nonattainment areas in several rounds. Round one designations were made in October 2013, based on violations of the NAAQS at ambient air monitors. A portion of Wayne County was designated nonattainment.

In May 2016, EGLE submitted its SO<sub>2</sub> SIP strategy for southern Wayne County to the USEPA for final approval. This SIP was the strategy for bringing the area into compliance with the health-based NAAQS for SO<sub>2</sub>. Due to a lawsuit related

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<sup>4</sup> The most recent NAAQS can be accessed here: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

to a portion of the SIP, USEPA is pursuing a Federal Implementation Plan (FIP) for the nonattainment area, the action of which is still underway. In January 2022, USEPA made the formal determination that southern Wayne County did not attain the SO<sub>2</sub> NAAQS by the 2018 deadline.

USEPA completed the FIP and a public comment period was held during June and July 2022. EGLE anticipates the finalization of the FIP during fall 2022 and is working to incorporate its provisions into an SO<sub>2</sub> SIP. Once all of the elements of the SIP have been implemented, EGLE plans to pursue a redesignation request for southern Wayne County.

Round two designations were based on modeling of emissions from sources emitting over 2000 tons of SO<sub>2</sub> per year. A portion of St. Clair County was designated nonattainment in September 2016.

To better understand the quality of the air in the nonattainment area, two monitors were installed in the vicinity in November 2016. The monitoring data has consistently shown SO<sub>2</sub> levels in the area to be below the SO<sub>2</sub> NAAQS. The CAA allows a state to submit a Clean Data Determination (CDD) to the USEPA if air monitors show three consecutive years of attaining data in a nonattainment area. This action waives the requirement for the state to produce a SIP for the nonattainment area.

EGLE determined that the CDD criteria had been met for the St. Clair nonattainment area and submitted a CDD to USEPA in July 2020, waiving the SIP requirement for the area. EGLE's CDD was approved by USEPA in December 2021. EGLE has begun working on a SIP submittal to pursue redesignation for the St. Clair County non-attainment area following the shutdown of the St. Clair Power Plant in May 2022.

Round three designations were to address all remaining undesignated areas by December 31, 2017. The USEPA sent a letter to Governor Snyder on August 22, 2017, 120 days prior to the intended designation date, indicating that Alpena County and Delta County are to be designated as unclassifiable/attainment

areas. Remaining areas of Michigan that were not required to be characterized and for which the USEPA does not have information suggesting that the area may not be meeting the NAAQS or contributing to air quality violations in a nearby area that does not meet the NAAQS, were also designated as unclassifiable/attainment.

**Ozone Nonattainment Areas:** In 2015, the USEPA strengthened the primary NAAQS for ozone, establishing a new 8-hour standard of 70 ppb.

On August 3, 2018, Michigan was designated marginal nonattainment for the 2015 ozone NAAQS in four areas (ten counties) of the state. In southeast Michigan, the seven-county area encompassing Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties and on the west-side, two partial counties including Allegan and Muskegon and one full county, Berrien were found to have design values<sup>5</sup> exceeding the new ozone NAAQS of 70 ppb. This classification established an attainment deadline and attainment plan submittal date of August 3, 2021. In addition to the requirement to attain by this deadline, there are also more stringent requirements for major source air permits, including lowest achievable emission rate conditions and offsets for new emissions of the ozone precursors of nitrogen oxide (NO<sub>x</sub>) and volatile organic compounds. To attain the standard, monitoring values over the three-year period between 2018 and 2020 must have design values at or below the standard of 70 ppb.

In the fall of 2021, EGLE completed a redesignation request for the seven-county southeast Michigan nonattainment area. Although design values for the three-year period between 2018 and 2020 did not show attainment with the 2015 ozone NAAQS, the design values for the three-year period between 2019 and 2021 did attain. The redesignation request was submitted to USEPA

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<sup>5</sup> The design value is the three-year average of the 4<sup>th</sup> highest 8-hour ozone value).

in January 2022, and it is currently under review. In March 2022 USEPA proposed to reclassify the southeast Michigan nonattainment area to attainment/maintenance for the 2015 ozone standard. The proposal was out for public comment until the end of April 2022 and one comment of significance was received. USEPA was working to address all comments to proceed with redesignation when elevated ozone values were detected by monitors in the nonattainment area. Efforts to redesignate the area are currently on hold and EGLE is working to evaluate data. The three western nonattainment counties (partial Muskegon and Allegan and full county Berrien) did not attain the standard.

In April 2022, USEPA proposed to determine that southeast and western Michigan counties did not attain the 2015 ozone standard by the attainment deadline and proposes reclassification from marginal to moderate nonattainment. A reclassification from marginal to moderate extends the attainment deadline to August 2024; however, a classification of moderate requires additional actions to reduce emissions to attain the standard. Required moderate nonattainment planning elements include (but are not limited to) major source reasonably available control technology, 15% reasonable further progress, and an attainment demonstration.

On October 7, 2022, USEPA issued its final determinations of attainment by the attainment date and reclassifications of areas classified as marginal for the 2015 ozone NAAQS. USEPA's final determination reclassified the three western nonattainment counties from marginal to moderate nonattainment. EGLE is currently working on an attainment SIP for those areas and expects to submit sometime in early 2023. USEPA did not include the seven-county southeast Michigan nonattainment area in this final determination and reclassification but indicated that they would act on that area in a separate action.

[Cross-State Air Pollution Rule](#) – The Cross-State Air Pollution Rule (CSAPR) was promulgated to address air pollution from upwind states that is transported across state lines and impacts the ability of downwind states to attain air

quality standards. The rule was developed in response to the Good Neighbor obligations under the CAA for the ozone standards and fine particulate matter standards. CSAPR is a cap-and-trade rule which governs the emission of SO<sub>2</sub> and NO<sub>x</sub> from fossil-fueled electric generating units (EGUs) through an allowance-based program. Under this program, NO<sub>x</sub> is regulated on both an annual basis and during the ozone season (April through October). Each allowance (annual or ozone season) permits the emission of one ton of NO<sub>x</sub>, with the emissions cap and number of allocated allowances decreasing over time. The USEPA promulgated the CSAPR Update, which addresses interstate transport for the 2008 ozone standard and went into effect in May 2017. The state currently has Good Neighbor obligations for the 2015 ozone standard.

On March 15, 2021, USEPA finalized the revised CSAPR rule update for the 2008 ozone NAAQS. Starting with the 2021 ozone season, the revised rule reduced the emission budgets and therefore allocation of NO<sub>x</sub> allowances from power plants in 12 states, including Michigan. The revision includes adjusting these 12 states emissions budgets for each ozone season from 2021 through 2024.

EPA establishes that the revised CSAPR update will reduce NO<sub>x</sub> emissions from power plants in 12 states in the eastern United States by 17,000 tons in 2021 compared to projections without the rule, yielding public health and climate benefits that are valued, on average, at up to \$2.8 billion each year from 2021 to 2040.

[Mercury and Air Toxics Standards](#) – Section 302 of the CAA requires the USEPA to adopt MACT for hazardous air pollutants (HAPs). The Mercury and Air Toxics Standards (MATS) became effective April 16, 2012. The MATS rule requires new and existing oil and coal-fueled facilities to achieve emission standards for mercury, acid gases, certain metals, and organic constituents. Existing sources were required to comply with these standards by April 16, 2015. Some individual sources were granted an additional year, at the discretion of the Air Quality Division of EGLE. In June 2015, the United States Supreme Court found that the USEPA did not properly consider costs in making its determination to



regulate hazardous pollutants from power plants. In December 2015, the District of Columbia Circuit Court of Appeals ruled that MATS may be enforced as the USEPA modifies the rule to comply with the United States Supreme Court decision. The deadline for MATS compliance for all EGUs was April 16, 2016.

In December 2015, in response to the United States Supreme Court's direction, the USEPA published a proposed supplemental finding that a consideration of cost does not alter their previous determination that it is appropriate and necessary to regulate air toxic emissions from coal- and oil-fired EGUs. The proposed supplemental finding was based on an evaluation of several cost metrics relevant to the power sector and considered public comments. USEPA found that the cost of compliance with MATS was reasonable and that the electric power industry could comply with MATS and maintain its ability to provide reliable electric power to consumers at a reasonable cost. USEPA's supplemental cost finding was finalized in April 2016.

In May 2020, USEPA completed a reconsideration of the April 2016 appropriate and necessary finding for the MATS, correcting flaws in the approach considering costs and benefits while ensuring that HAP emissions from power plants continue to be appropriately controlled. The agency also completed the CAA required residual risk and technology review for MATS. Following that reconsideration, USEPA concluded that the consideration of cost in the 2016 Supplemental Finding was flawed. Specifically, they found that what was described in the 2016 Supplemental Finding as the preferred approach, or "cost reasonableness test," did not meet the statute's requirements to fully consider costs and was an unreasonable interpretation of the CAA mandate. Power plants were already complying with the standards limiting emissions of mercury and other HAPs, and that final action leaves those emission limits in place and unchanged.

In January 2022 USEPA issued a proposal to reaffirm that it remains appropriate and necessary to regulate HAPs, including mercury, from power

plants after considering cost. This action revokes the May 2020 finding that it was not appropriate and necessary to regulate coal- and oil-fired power plants under CAA Section 112 which covers toxic air pollutants. USEPA reviewed the 2020 finding and considered updated information on both the public health burden associated with HAP emissions from coal- and oil-fired power plants as well as the costs associated with reducing those emissions under the MATS. After weighing the public risks posed by these emissions to particularly exposed and sensitive populations, against the costs of reducing HAP emissions, USEPA is proposing to conclude that it remains appropriate and necessary to regulate these emissions.

CAA Section 111(b), Standards of Performance for Greenhouse Gas Emissions from New, Modified and Reconstructed Stationary Sources: Electric Utility Generating Units – New Source Performance Standards (NSPS) are established under Section 111(b) of the CAA for certain industrial sources of emissions determined to endanger public health and welfare. In October 2015, the USEPA finalized a NSPS that established standards for emissions of carbon dioxide (CO<sub>2</sub>) for newly constructed, modified, and reconstructed fossil-fuel fired EGUs. There are different standards of performance for fossil fuel-fired steam generating units and fossil fuel-fired combustion turbines.<sup>6</sup>

CAA Section 111(d), Carbon Pollution Emission Guidelines for Existing Stationary Sources - Electric Utility Generating Units (Clean Power Plan) – Section 111(d) of the CAA requires the USEPA to establish standards for certain existing industrial sources. The final Clean Power Plan (CPP), promulgated on October 23, 2015, addressed CO<sub>2</sub> emissions from EGUs. The CPP established interim and final statewide goals and tasked states with developing and implementing

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<sup>6</sup> The 111(b) standards can be found in Table 1 here: <https://www.federalregister.gov/documents/2015/10/23/2015-22837/standards-of-performance-for-greenhouse-gas-emissions-from-new-modified-and-reconstructed-stationary>.

plans for meeting the goals. Michigan's final goal was to reduce CO<sub>2</sub> emissions by 31 percent from a 2005 baseline by 2030.<sup>7</sup>

On February 9, 2016, the United States Supreme Court issued five orders granting a stay of the CPP pending judicial review. On March 28, 2017, President Trump signed an Executive Order directing the USEPA to review the CPP and the standards of performance for new, modified, and reconstructed EGUs (Section 111(b) rule). As a result, the Department of Justice filed motions to hold those cases in abeyance pending the USEPA's review of both rules, including through the conclusion of any rulemaking process that results from that review.

On June 19, 2016, the USEPA promulgated the Affordable Clean Energy (ACE) Rule which replaced and repealed the CPP. The ACE rule established emission guidelines for states to use in developing plans to limit carbon emissions at their coal-fired EGUs; but did not establish specific carbon emission reduction goals. The ACE rule focused on an "inside the fence line" best system of emission reduction (BSER) approach to emission reductions in the form of heat rate improvements at each EGU. On January 19, 2021, the United States Court of Appeals for the District of Columbia Circuit vacated the ACE rule and remanded it back to the USEPA for further proceedings consistent with the Court's ruling. On October 29, 2021, the United States Supreme Court agreed to grant a writ of certiorari for petitions for review of the January 2021 decision of the United States Court of Appeals for the District of Columbia Circuit to strike down USEPA's 2019 ACE Rule. Four pending petitions before the United States Supreme Court were filed earlier in 2021 by a coalition of 19 states led by West Virginia, the State of North Dakota, the North American Coal Corporation, and Westmoreland Mining Holdings, LLC. The Supreme Court heard the four combined cases on February 28, 2022 and the case was decided on June 30, 2022. While the Court did indicate that including generation shifting (away from coal to cleaner forms of energy generation) as the BSER would inappropriately transform USEPA's authority from reducing pollution to

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<sup>7</sup> The 111(d) rule can be viewed in full here: <https://www.federalregister.gov/documents/2015/10/23/2015-22842/carbon-pollution-emission-guidelines-for-existing-stationary-sources-electric-utility-generating>.

setting the national generation mix, it also clarified that USEPA can regulate the power sector. The Court relied on the “major questions” doctrine which holds that courts should not defer to agencies on matters of “vast economic or political significance” unless Congress has explicitly given the agencies the authority to act in those situations thus limiting the power of the USEPA (and other agencies) in the absence of a clear congressional mandate to do so.

Although there are not currently any rules regulating carbon emissions from existing EGUs; due to the USEPA’s 2009 endangerment finding on greenhouse gases, and in light of the current carbon reduction goals at both state and federal levels, utilities should address their anticipated greenhouse gas emissions with those carbon reduction goals in mind. In addition, USEPA has announced plans to propose new carbon reduction regulations for existing power plants in spring 2023 and is holding meetings with stakeholders to help inform that proposal.

[Greenhouse Gas Reporting Program](#) – The Greenhouse Gas Reporting Program (codified at 40 CFR Part 98) tracks facility-level emissions of greenhouse gas from large emitting facilities, suppliers of fossil fuels, suppliers of industrial gases that result in greenhouse gas emissions when used, and facilities that inject CO<sub>2</sub> underground. Facilities calculate their emissions using approved methodologies and report the data to the USEPA. Annual reports covering emissions from the prior calendar year are due by March 31 of each year. The USEPA conducts a multi-step verification process to ensure reported data is accurate, complete, and consistent. This data is made available to the public in October of each year through several data portals.

[Boiler Maximum Achievable Control Technology](#) – The Boiler MACT establishes national emission standards for HAPs from three major source categories: industrial boilers, commercial and institutional boilers, and process heaters. The final emission standards for control of mercury, hydrogen chloride, particulate matter (as a surrogate for non-mercury metals), and carbon monoxide (as a surrogate for organic hazardous emissions) from coal-fired, biomass-fired, and liquid-fired major source boilers are based on the MACT. In addition, all major source boilers and process heaters are subject to a work

practice standard to periodically conduct tune-ups of the boiler or process heater.

**Regional Haze** – Section 169 of the federal CAA sets forth the provisions to improve visibility, or visual air quality, in 156 national parks and wilderness areas across the country by establishing a national goal to remedy impairment of visibility in Class 1 federal areas from manmade air pollution. States must ensure that emission reductions occur over a period of time to achieve natural conditions by 2064. Air pollutants that have the potential to affect visibility include fine particulates, NO<sub>x</sub>, SO<sub>2</sub>, certain volatile organic compounds, and ammonia. The 1999 Regional Haze rule required states to evaluate the best available retrofit technology (BART) to address visibility impairment from certain categories of major stationary sources built between 1962 and 1977. A BART analysis considered five factors as part of each source-specific analysis: 1) the costs of compliance, 2) the energy and non-air quality environmental impacts of compliance, 3) any existing pollution control technology in use at the source, 4) the remaining useful life of the source, and 5) the degree of visibility improvement that may reasonably be anticipated to result from use of such technology. For fossil-fueled electric generating plants with a total generating capacity in excess of 750 megawatts (MW), states must use guidelines promulgated by the USEPA. In 2005, the USEPA published the guidelines for BART determinations. Michigan has met the initial BART determination requirements. In December 2016, the USEPA issued a final rule setting revised and clarifying requirements for periodic updates in state plans. The next periodic update was due July 31, 2021. EGLE has submitted the periodic update and it is currently being reviewed by USEPA. There are two Class 1 areas in Michigan: Seney National Wildlife Refuge and Isle Royale National Park. Michigan also has an obligation to eliminate the state's contribution to impairment in Class 1 areas in other states.

**Resource Conservation and Recovery Act** – The Resource Conservation and Recovery Act (RCRA) gives the USEPA the authority to control hazardous waste

from the "cradle-to-grave", which includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes.

In April 2015, the USEPA established requirements for the safe disposal of coal combustion residuals (CCR) produced at electric utilities and independent power producers. These requirements were established under Subtitle D of RCRA and apply to CCR landfills and surface impoundments. Michigan electric utilities must comply with these regulations.

In July 2016, the USEPA Administrator signed a direct final rule and a companion proposal to extend for certain inactive CCR surface impoundments the compliance deadlines established by the regulations for the disposal of CCR under Subtitle D (Non-hazardous solid waste). These revisions were completed in response to a partial vacatur ordered by the United States Court of Appeals for the District of Columbia Circuit on June 14, 2016. This direct final rule became effective on October 4, 2016.

In July 2018, the USEPA finalized certain revisions to the 2015 regulations for the disposal of CCR in landfills and surface impoundments to provide states with approved CCR permit programs under the Water Infrastructure Improvements for the Nation (WIIN) Act or USEPA (where USEPA is the permitting authority) the ability to use alternate performance standards and to revise the groundwater protection standards for four constituents in Appendix IV to part 257 for which maximum contaminant levels under the Safe Drinking Water Act had not been established. The revision also provided facilities which are triggered into closure by the regulations additional time to cease receiving waste and initiate closure. This additional time was meant to better align the CCR rule compliance dates with the Effluent Limitations Guidelines (ELGs) and Standards Rule for the Steam Electric Power Generating Point Source Category.

In September 2020, the USEPA finalized amendments to the part 257 regulations. First, the USEPA finalized a change to the classification of compacted-soil lined or “clay-lined” surface impoundments from “lined” to “unlined” under §257.71(a)(1)(i), which reflected the vacatur ordered in the Utility Solid Waste Activities Group (USWAG) decision. Secondly, USEPA finalized revisions to the initiation of closure deadlines for unlined CCR surface impoundments, and for units that failed the aquifer location restriction, found in §257.101(a) and (b)(1). These revisions addressed the USWAG decisions with respect to all unlined and “clay-lined” impoundments, as well as revisions to the provisions that were remanded to the Agency for further reconsideration. Specifically, USEPA finalized a new deadline of April 11, 2021, for CCR units to cease receipt of waste and initiate closure because the unit was either an unlined or formerly “clay-lined” CCR surface impoundment (§257.101(a)) or failed the aquifer location standard (§257.101(b)(1)). With this action, USEPA also finalized revisions to the alternative closure provisions, §257.103. The revisions granted facilities additional time to develop alternative capacity to manage their waste streams (both CCR and/or non-CCR), to achieve cease receipt of waste and initiate closure of their CCR surface impoundments.

In November 2020, the USEPA published the CCR Part B final rule which allowed a limited number of facilities to demonstrate to USEPA or a participating state director that, based on groundwater data and the design of a particular surface impoundment, the unit had and will continue to ensure there is no reasonable probability of adverse effects to human health and the environment. The regulations stated that facilities had until November 30, 2020, to submit applications to USEPA for approval, but given the effective date for the final rule was December 14, 2020, USEPA accepted revisions or applications until December 14, 2020.

In October 2020, USEPA issued an advanced notice of proposed rulemaking seeking input on inactive surface impoundments at inactive electric utilities, referred to as “legacy CCR surface impoundments”. The information and data

received will assist in the development of future regulations for these CCR units.

[Clean Water Act](#) – The Clean Water Act is a United States federal law designed to control water pollution on a national level.

[Clean Water Act Section 316\(b\)](#) – The USEPA promulgated rules under Section 316(b) of the Clean Water Act establishing standards for cooling water intake structures at new and existing facilities in order to minimize the impingement and entrainment of fish and other aquatic organisms at these structures. Section 316(b) applies to existing electric generation facilities with a design intake flow greater than two million gallons per day that use at least 25% of the water withdrawn from the surface waters of the United States for cooling purposes.

In 2001, the USEPA promulgated rules specific to cooling water intake structures at new facilities. Generally, new greenfield, stand-alone facilities are required to construct the facility to limit the intake capacity and velocity requirements commensurate with that achievable with a closed-cycle, recirculating cooling system.

Following a previously promulgated version of the rules and judicial remand, the regulations for existing facilities were promulgated in August 2014. These rules were also challenged and undergoing judicial review. According to the published rules, any facility subject to the existing facilities rule must identify which one of the seven alternatives identified in the best technology available (BTA) standard will be met for compliance with minimizing impingement mortality. The rules do not specify national BTA standards for minimizing entrainment mortality, but instead require that EGLE establish the BTA entrainment requirements for a facility on a site-specific basis. These BTA requirements are established after consideration of the specific factors spelled out in the rule. Facilities with actual flows in excess of 125 million gallons per day must provide an entrainment study with its National Pollutant Discharge



Elimination System (NPDES) permit application. While the rules do not specify a deadline for compliance of the rules, facilities will need to achieve the impingement and entrainment mortality standards as soon as practicable according to the schedule of requirements set by EGLE following NPDES permit reissuance.

[Steam Electric Effluent Guidelines](#) – The Steam Electric Effluent Guidelines (SEEG), promulgated under the Clean Water Act, strengthens the technology-based Effluent Limitation Guidelines (ELG) and standards for the steam electric power generating industry. The 2015 amendment to the rule established national limits on the amount of toxic metals and other pollutants that steam electric power plants are allowed to discharge. Multiple petitions for review challenging the regulations were consolidated in the United States Court of Appeals for the Fifth Circuit on December 8, 2015. On April 25, 2017, the USEPA issued an administrative stay of the compliance dates in the ELGs and standards rule that had not yet passed pending judicial review. In addition, the USEPA requested, and was granted, a 120-day stay of the litigation (until September 12, 2017) to allow the USEPA to consider the merits of the petitions for reconsideration of the Rule. On August 11, 2017, the USEPA provided notice that it would conduct a rulemaking to revise the new, more stringent BTA effluent limitations and Pretreatment Standards for Existing Sources in the 2015 rule that apply to bottom ash (BA) transport water and flue gas desulfurization (FGD) wastewater. The EPA published the regulations on October 13, 2020, finalizing the revisions for these two wastewaters allowing for less costly technologies, a two-year extension of the compliance time frame and for meeting the requirements, and adding subcategories for both wastewaters. The subcategories included a voluntary incentive program for more restrictive limitations for FGD wastewaters with a longer compliance schedule, and an allowance that EGUs that decommission by December 31, 2028, need not comply with the more costly and restrictive requirements of the 2015 ELGs based upon a cost evaluation which takes into consideration the remaining useful lifespan of these facilities. The earliest date for compliance

with BA and FGD wastewaters was set for October 13, 2021, but no later than December 31, 2025, unless the facility announces compliance with an optional program. In addition, the EPA published an announcement on August 3, 2021, on its decision to undertake additional rulemaking to again revise the SEEG. As part of the rulemaking process, the EPA will determine whether more stringent effluent limitations and standards are appropriate and consistent with the technology-forcing statutory scheme and the goals of the Clean Water Act. EPA intends to publish the proposed rulemaking for public comment in the fall of 2022. On September 18, 2017, the 120-day administrative stay was lifted postponing certain compliance deadlines. The earliest date for compliance with SEEG was November 1, 2020.

On August 31, 2020, USEPA finalized a rule revising the regulations for the Steam Electric Power Generating category (40 CFR Part 423). The rule revises requirements for two specific waste streams produced by steam electric power plants: FGD wastewater and BA transport water. In the revised rule, USEPA delays the compliance deadlines for BA transport water and FGD wastewater two years to December 31, 2025. In addition, the revised rule includes a voluntary incentive program that provides additional time, until December 31, 2028, for facilities that implement additional processes that achieve more stringent limitations and has an allowance that EGUs that decommission by December 31, 2028, need not comply with the more costly and restrictive requirements of the 2015 ELGs based upon a cost evaluation which takes into consideration the remaining useful lifespan of these facilities.

#### State Rules and Laws:

The majority of Michigan's environmental regulations, and laws were consolidated into the Natural Resources and Environmental Protection Act (NREPA) of 1994, PA 451 as amended (Act 451). Act 451 is organized into sections called "Parts" and serves "to protect the environment and natural resources of the state; to codify, revise, consolidate, and classify laws relating to the environment and natural resources of the state; to regulate the discharge

of certain substances into the environment; to regulate the use of certain lands, waters, and other natural resources of the state; to protect the people's right to hunt and fish; to prescribe the powers and duties of certain state and local agencies and officials; to provide for certain charges, fees, assessments, and donations; to provide certain appropriations; to prescribe penalties and provide remedies; and to repeal acts and parts of acts.”

[Michigan Mercury Rule](#) – The purpose of the Michigan Mercury Rule (MMR) is to regulate the emissions of mercury in the State of Michigan. Existing coal-fired EGUs must choose one of three methods to comply with the emission limits and any new EGU will be required to utilize Best Available Control Technology. The MMR is identical to the MATS in its limitations and all compliance dates for this rule have since past.

[Michigan Environmental Protection Act](#) – Part 17 of Michigan’s NREPA, 1994 PA 451. Under Michigan Environmental Protection Act (MEPA), the attorney general or any person may maintain an action for an alleged violation or when one is likely to occur for declaratory and equitable relief against any person for the protection of the air, water, and other natural resources and the public trust in these resources from pollution, impairment, or destruction. MEPA also provides for consideration of environmental impairment and whether a feasible and prudent alternative exists to any impairment consistent with the promotion of the public health, safety, and welfare in light of the state’s paramount concern for the protection of its natural resources from pollution, impairment, or destruction.

[Solid Waste Management \(Part 115\)](#) – Part 115 of the Michigan NREPA regulates CCR as a solid waste. It requires any CCR that will remain in place in a surface impoundment or landfill be subject to siting criteria, permitting, and licensing of the disposal area, construction standards for the disposal area, groundwater monitoring, corrective action, and financial assurance and post-closure care for a 30-year period. The disposal facility is required to maintain the financial

assurance to conduct groundwater monitoring throughout the post-closure care period.

The disposal facility is required to maintain the financial assurance to conduct groundwater monitoring throughout the post-closure care period. The disposal of CCR is currently dually regulated under the RCRA rule published in April 2015, and under Part 115 of the NREPA. However, in December 2016, the WIIN Act was passed, which included an amendment to Section 4005 of RCRA providing a mechanism to allow states to develop a state permitting program for regulation of CCR units. Under the amendment, upon approval of a state program, the RCRA regulations would be enforced by states and the CCR units would not be subject to the dual regulatory structure. In 2018, Part 115 was amended to include the majority of the RCRA regulations would be enforced by states and the CCR units would not be subject to the dual regulatory structure. Michigan's request for state program approval is currently under review by the USEPA.

Water Quality Based Effluent Limits for Toxic Substances (Part 8) - Michigan's Part 8 Rules, Water Quality-Based Effluent Limit Development for Toxic Substances are used to establish toxic substance water quality based effluent limits (WQBELs) for point source discharges that are protective of the designated uses of the surface waters of the state. Part 8 includes provisions for establishing total maximum daily loads, wasteload allocations for toxic substances, reasonable potential for chemical specific WQBELs, and calculating WQBELs that are less than the quantification level.

To achieve compliance with the low WQBELs (those that are less than the quantification level) and associated regulatory requirements, the department encourages, the use of pollution prevention, source control, and other waste minimization programs. End-of-pipe treatment for the low WQBELs which is extraordinary or beyond that which would be necessary if not for the low WQBELs is not required by the department unless it is determined to be the

most cost-effective means or the only means to achieve the applicable water quality-based effluent limit.

*To comply with PA 341 Section 6t (5) (m)*

“How the utility will comply with all applicable state and federal environmental regulations, laws and rules, and the projected costs of complying with those regulations, laws and rules.”

In developing its IRP, a utility should present an environmental compliance strategy which demonstrates how the utility will comply with all applicable federal and state environmental regulations, laws, and rules. Included with this information, the utility should analyze the cost of compliance on its existing generation fleet going forward, including existing projects being undertaken on the utility's generation fleet, and include the relevant future compliance costs within the IRP model. Review and approval of an electric utility's IRP by the MPSC does not constitute a finding of actual compliance with applicable state and federal environmental laws. Electric utilities that construct and operate a facility included in an approved IRP remain responsible for complying with all applicable state and federal environmental laws.

## **VI. Planning Reserve Margins and Local Clearing Requirements**

*To comply with PA 341 Section 6t (1) (e)*

Compliance with Section 6t (1) (e) requires the identification of any required planning reserve margins and LCRs in areas of the state of Michigan. The majority of Michigan is part of the Midcontinent Independent System Operator (MISO). MISO is divided into local resource zones (LRZs or Zones) with the majority of the Lower Peninsula in Zone 7 and the Upper Peninsula combined with a large portion of Wisconsin in Zone 2, as shown in Appendix B. The unshaded portion of the southwest area of the Lower Peninsula is served by the PJM regional transmission operator. While the PJM has similar reliability criteria to MISO, there are some differences in terminology and details.

MISO publishes planning reserve margins in its annual Loss of Load Expectation (LOLE) Study Report each November.<sup>8</sup> The MISO LOLE Study Report includes the planning reserve margin for the next ten years in a table labeled, “MISO System Planning Reserve Margins 2022 through 2031” for the entire footprint. MISO also calculates the local reliability requirement of each Zone in the LOLE Study Report. The local reliability requirement is a measure of the planning resources required to be physically located inside a LRZ without considering any imports from outside of the zone in order to meet the reliability criterion of one day in ten years LOLE. The MISO LCR is defined as “the minimum amount of unforced capacity that is physically located within the LRZ that is required to meet the LOLE requirement while fully using the Capacity Import Limit for such.” The LCR for each LRZ is reported annually with the MISO planning resource auction results in April.<sup>9</sup>

For the southwest corner of the Lower Peninsula, in PJM’s territory,<sup>10</sup> similar reliability requirements are outlined in PJM Manual 18 for the PJM Capacity Market.<sup>11</sup> PJM outlines requirements for an Installed Reserve Margin, similar to MISO’s planning reserve margin on an installed capacity basis, and a Forecast Pool Requirement on an unforced capacity basis, similar to MISO’s planning reserve margin on an unforced capacity basis. PJM also specifies 27 Local Deliverability Areas somewhat similar to MISO’s LRZ. PJM publishes a Reserve

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<sup>8</sup> MISO 2022-2023 Loss of Load Expectation Study Report published on November 1, 2021  
<https://cdn.misoenergy.org/PY%202022-23%20LOLE%20Study%20Report601325.pdf>.

<sup>9</sup> MISO Planning Resource Auction results, April 2021  
<https://cdn.misoenergy.org/PY21-22%20Planning%20Resource%20Auction%20Results541166.pdf>

<sup>10</sup> See Appendix C for a map of PJM Local Deliverability Areas.

<sup>11</sup> See Appendix C for a map of PJM Local Deliverability Areas.

Requirement Study<sup>12</sup> annually in October containing the requirements for generator owners and load serving entities within its footprint for the next ten years.

Electric utilities required to file IRPs under Section 6t are also required to annually make demonstrations to the MPSC that they have adequate resources to serve anticipated customer needs four years into the future, pursuant to Section 6w of PA 341. On September 15, 2017, in Case No. U-18197, the MPSC adopted an order establishing a capacity demonstration process in an effort to implement the State Reliability Mechanism (SRM) requirements of Section 6w. This order established SRM-specific planning reserve margin requirements for each electric provider in Michigan for the period of planning years 2018 through 2021. In an order issued on October 14, 2017, in Case No. U-18444, the MPSC initiated a proceeding to establish a methodology to determine a forward locational requirement, to establish a methodology to determine a forward planning reserve margin requirement, and to establish these requirements for planning year 2022. In addition to planning to meet the reliability requirements of the regional grid operator (MISO or PJM, as applicable), electric utility IRP filings should be consistent with the requirements of the SRM under Section 6w, as established in Case Nos. U-18197, U-18444, and any subsequent cases initiated to implement these provisions.

## **VII. Modeling Scenarios, Sensitivities and Assumptions**

*To comply with PA 341 Section 6t (1)(f)*

For utilities located in the Michigan portion of MISO Zone 2 and MISO Zone 7, two modeling scenarios are required. Northern States Power-Wisconsin and

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<sup>12</sup> PJM Reserve Requirement Study, October 2021.

<https://www.pjm.com/-/media/committees-groups/subcommittees/raas/2021/20211004/20211004-pjm-reserve-requirement-study.ashx>

Indiana Michigan Power Company are utilities located in Michigan that already file multi-state IRPs in other jurisdictions. Due to the provisions in PA 341 Section 6t (4) regarding multi-state IRPs, Northern States Power-Wisconsin and Indiana Michigan Power Company are intentionally excluded from the explicit requirement to model the outlined scenarios. However, the multi-state utilities are encouraged to include the provisions included in each scenario. The Commission may request additional information from multi-state utilities prior to approving an IRP pursuant to Section 6t (4) of PA 341.

### Scenario #1

(Applicability: Utilities located in the Michigan portion of MISO Zone 2 and MISO Zone 7, encouraged for multi-state utilities.)

This scenario directionally aligns with MISO's December 2021 Futures Report, Future 1 and reflects substantial achievement of state and utility announcements including generation retirements and environmental goals. This scenario incorporates 100% of utility IRP retirement announcements and retirement assumptions throughout the MISO footprint, as identified in MISO Future 1. For the utility performing the analysis, the generation unit retirement assumptions may vary for only the generation units for which the utility has decision making authority or for any unit retirements that have been publicly announced since publication of the MISO report. The filing utility may incorporate more recently announced retirements if practical. As subsequent MISO Futures Reports are released, updated retirement assumptions identified in the Future most similar to Future 1 of the December 2021 report should be used.<sup>13</sup> This scenario assumes that CO<sub>2</sub> emissions decline, driven by state goals and utility plans throughout the MISO footprint creating at least a

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<sup>13</sup> Scenario 1 aligns with MISO Future 1 from the December 2021 MISO Futures Report. If, in the future, MISO Futures significantly change in future reports, regulated utilities will work with Staff to determine the most appropriate future to use for Scenario 1.



63% carbon reduction by 2040<sup>14</sup> from the baseline year of 2005 for the MISO region. Carbon emissions continue to decline on this trajectory 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 footprint wide demand and energy growth rates. Utilities may use the most recent United States Energy Information Administration (EIA) Annual Energy Outlook (AEO) Reference Case<sup>15</sup> or other reputable source for forecasted EV adoption rates. If the utility does not use EIA AEO, then the EV forecast information must be provided within the utility IRP filing. Using this information, a utility may develop its own demand and energy forecasts with description and detail how its forecast has included the impacts of climate change,<sup>16</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 United States EIA most recent AEO.<sup>17</sup>
- Moderate EV adoption and customer electrification result in moderate MISO footprint-wide demand and energy growth. Within Michigan, EV and electrification forecasts should be blended with historical sales such

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<sup>14</sup> This carbon reduction is an output of the MISO expansion plan for 2021 MISO Future 1. Subsequent expansion plan modeling may update the regions overall carbon reduction percentage.

<sup>15</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). The utility may use an alternate electric vehicle forecast provided the forecast is publicly available and the inputs and methodology is available and auditable.

<sup>16</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.

<sup>17</sup> The natural gas price forecast utilized should be consistent with the EIA's most recent Annual Energy Outlook natural gas spot price at Henry Hub in nominal dollars and include delivery costs from Henry Hub to the point of delivery.

that after three years, Michigan's load and demand increase reflects the source forecasts for EV and electrification technologies. Utility 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 maybe based off the Reference Case in the most recent EIA AEO. Electrification technology forecasts should be based off either established proprietary forecasts or publicly available data.

- Resource assumptions: MISO Future 1 retirements for existing thermal and nuclear generation resources published in the most recent Futures Report should be used when available along with recent public announcements. 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). In the absence of a MISO defined retirement assumption, maximum age assumption by resource type as specified by applicable regional transmission organization (RTO) can also be used. 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 and reliability.
- 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).
- For all in-state electric utilities participating in the State EWR Program, EWR should be based upon the minimum allowed under the incentive of 1.5% and should be based upon an average cost of megawatt hour (MWh) saved. The model should include an EWR supply cost curve to project future program expenditures beyond baseline assumptions that includes a projection of lifetime savings (MWh) and lifetime benefits (\$). There should be no cap on EWR savings levels beyond 1.5% or a cap on

costs associated with EWR programs as long as the program portfolio is cost effective based on a UCT score of 1.0 or greater.

- Existing tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- Energy storage resources are modeled using available best practice methodologies to the extent that such guidelines exist.<sup>18</sup> Allow for multiple market revenue streams where applicable and demonstrate the utility is reasonably capturing the full value of storage.
- Technology costs for thermal units and wind track with mid-range industry expectations.
- Technology costs and limits to the total resource amount available for EWR and DR programs will be informed by the most recently Commission approved state-wide potential study and may be augmented by prior EWR and DR potential studies and/or additional research.
- Technology costs for solar, storage, and other emerging technologies decline with commercial experience consistent with National Renewable Energy Laboratory (NREL) or other publicly available reputable sources.
- Existing Public Utility Regulatory Policies Act (PURPA) qualifying facilities (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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<sup>18</sup> Staff Report in Case No. U-20633 issued, May 27, 2021, and adopted by the Commission in its September 24, 2021 order.

## Scenario #1 Sensitivities:

1. Fuel cost: 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.<sup>19</sup>
2. Load projections:
  - (a) High load growth: For the filing utility's load obligation, increase the energy growth rate by at least a factor of two above the base case energy or 0.5% (whichever is larger) on a per customer basis. Adjust demand accordingly. For the region included in the scenario utilize load growth 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 four year forward demonstration period and the remainder returning in the demonstration year of the utility's next capacity demonstration filing. This sensitivity does not apply to utilities within an RTO that requires the incumbent utility to show capacity for choice load.
3. If the utility is not already achieving 2% EWR, ramp up the utility's EWR savings to at least 2.0% of prior year sales over the course of three years within the utility's Michigan jurisdiction.<sup>20</sup> EWR savings remain at 2% throughout the remainder of the study period.

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<sup>19</sup> For example, the [most recent EIA AEO Low Oil and Gas Supply](#) natural gas price is \$8.41/MMBtu (\$2019) in 2040.

<sup>20</sup> 2021 Energy Waste Reduction Potential Study, Appendix D.

## Scenario #2

Applicability: Utilities located in the Michigan portion of MISO Zone 2 and MISO Zone 7 (encouraged for multi-state utilities).

This scenario aligns with the MISO's December 2021 Futures Report, Future 3.<sup>21</sup> 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 should be used.

This scenario assumes significant advancements toward electrification that drives a total energy and demand annual growth rates to 1.71% and 1.41% respectively throughout the Eastern Interconnect.<sup>22</sup> Utilities should assume EV adoption reaches 50% of total vehicle sales by 2030 with a trend toward 100% of vehicle sales continues throughout the remainder of the study period, consistent with the MI Healthy Climate Plan goals. Using this information, utilities may develop their own demand and energy forecasts for their service territory with description and detail how their forecast has included the impacts of climate change,<sup>23</sup> electrification, demand side resources, and customer owned distributed generation and how these factors impact overall load and demand.

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<sup>21</sup> The most recent MISO futures are published on the MISO website:  
<https://www.misoenergy.org/planning/transmission-planning/futures-development/>

<sup>22</sup> Scenario 2 aligns with MISO Future 3 from the December 2021 MISO Futures Report. If, in the future, MISO Futures significantly change, regulated utilities will work with Staff to determine the most appropriate future to use for Scenario 2.

<sup>23</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.

Emissions decline driven by state goals and utility plans throughout the MISO footprint, creating at least an 80% carbon reduction by 2040 by the baseline year of 2005 for the MISO region. For utilities operating in PJM, assume 80% carbon reduction by 2040 from the baseline year of 2005 for the PJM region. If PJM provides no set goal, then utilities shall utilize carbon reduction goals set by their respective corporate entity. This trajectory of carbon reduction is expected to continue beyond 2040. Market energy transactions are modeled at a carbon intensity consistent with the relevant RTO system average. MISO expected system averages are identified in Future 3.<sup>24</sup>

- Natural gas prices utilized are consistent with Reference Case projections from the United States EIA's most recent AEO.<sup>25</sup>
- Current DR, energy efficiency, and utility distributed generation programs remain in place and additional growth in those programs would happen if they were economically selected by the model or to help comply with the specified carbon reductions in this scenario.
- Consistent with the most recent MISO Future 3, EV adoption and customer electrification increases causing adjustments in utility load profiles as electrification and EV's are adopted through the planning horizon.
- Specific new units are modeled in the LRZ if under construction or with regulatory approval (i.e., IRP cost pre-approval, CON, signed GIA, Renewable Energy Plan, or Voluntary Green Pricing Plan) for units in the utility's resource zone only (i.e, DTE Electric's LRZ is MISO Zone 7).

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<sup>24</sup> Scenario 2 aligns with MISO Future 3 from the December 2021 MISO Futures Report. If, in the future, MISO Futures significantly change, regulated utilities will work with Staff to determine the most appropriate future to use for Scenario 2.

<sup>25</sup> The natural gas price forecast utilized should be consistent with the EIA's most recent Annual Energy Outlook natural gas spot price at Henry Hub in nominal dollars and also including delivery costs from Henry Hub to the point of delivery.

- For an electric utility independently administering its own EWR program, maintain a 2% EWR savings. If the utility is not already at 2%, ramp up the utility's EWR savings to at least 2.0% of prior year sales over the course of 3 years, using EWR cost supply curves provided in the 2021 supplemental potential study for more aggressive potential. EWR savings remain at 2% throughout the study period.
- Achieve and maintain a 50% renewable energy portfolio by 2030 and another 10% from other renewable resources such as voluntary green pricing and distributed generation.<sup>26</sup>
- Existing renewable energy production and storage tax credits and renewable energy and storage investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- 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 and demonstrate the utility is reasonably capturing the full value of storage.
- Technology costs for wind, solar, storage and other renewables decline linearly with commercial experience and forecasted at levels resulting in a 30% reduction from Scenario 1 by the end of the 20-year study period.
- Existing tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- Technology costs and limits to the total resource amount available for EWR and DR programs will be informed by the most recently Commission approved state-wide potential study and may be augmented by prior EWR and DR potential studies and/or additional research as well as by the actual experience of EWR programs in Michigan.

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<sup>26</sup> Exemption if this requirement would result in curtailment of other carbon free resources.

- 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.
- Storage should be modeled assuming MI Healthy Climate Plan statewide goals are achieved on a utility load share basis.

#### 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 Supply forecast natural gas fuel price projections by the end of the 20-year study period.<sup>27</sup>
2. Assume all coal facilities in Michigan are retired by 2030 and Michigan electric sector meets an 80% carbon reduction from the 2005 baseline, modeled as a hard cap on the amount of carbon emissions.<sup>28</sup>
3. Remove the assumed 50% RPS and assume that 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). Assume 10% from other renewable resources such as voluntary green pricing and distributed generation remains.

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<sup>27</sup> For example, the most recent [EIA AEO Low Oil and Gas Supply natural gas price](#) is \$8.41/MMBtu (\$2019) in 2040.

<sup>28</sup> Based upon ramping to a net zero carbon power sector by 2035 <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>



4. For electric utilities independently administering its own EWR program, ramp up to 2.5% EWR savings based upon prior year sales within the utility's Michigan jurisdiction.

## VIII. Michigan IRP Modeling Input Assumptions and Sources

The following IRP modeling input assumptions and sources are recommended to be used in conjunction with the descriptions of the scenarios and sensitivities.

	Value	Sources
1 - Analysis Period	<ul style="list-style-type: none"> <li>A minimum analysis period of 20 years, with reporting for years 5, 10, and 15 at a minimum as specified in the statute.</li> </ul>	
2 - Model Region	<ul style="list-style-type: none"> <li>The minimum model region includes the utility's service territory, with transmission interconnections modeled to the remainder of Michigan, adjacent Canadian provinces if applicable. A larger model region is preferable, including the applicable RTO region as deemed appropriate by utility.</li> </ul>	
3 - Economic Indicators and Financial Assumptions (e.g., Weighted Average Cost of Capital)	<ul style="list-style-type: none"> <li>Utility-specific</li> </ul>	<ul style="list-style-type: none"> <li>Prevailing value from most recent MPSC proceedings</li> </ul>
4 - Load Forecast	<ul style="list-style-type: none"> <li>50/50 forecast</li> <li>Forecasts other than 50/50 utilized to align with scenario and/or sensitivity descriptions should be documented and justified.</li> </ul>	<ul style="list-style-type: none"> <li>Utility forecast and applicable RTO forecasts</li> </ul>
5 - Unit Retirements	<ul style="list-style-type: none"> <li>Retirements driven by maximum age assumption or economics</li> <li>Public announcements on retirements</li> </ul>	<ul style="list-style-type: none"> <li>MISO or PJM documented fuel type retirements</li> <li>All retirement assumptions must be documented</li> <li>Retirement assumptions throughout the MISO footprint are consistent with <a href="#">MISO futures development</a> Future 1 and Future 3.</li> </ul>
6 - Natural Gas Price nominal dollars \$/MMBtu	<ul style="list-style-type: none"> <li>Forecasts utilized should align with scenario and/or sensitivity descriptions; Gas prices should include transportation costs.</li> </ul>	<ul style="list-style-type: none"> <li>NYMEX futures (applicable for near-term forecast only)</li> <li><a href="#">EIA Annual Energy Outlook</a></li> <li>EIA Table 3: Energy Prices</li> <li><a href="#">EIA Short-Term Energy Outlook</a> Reports</li> <li>If utility-specific data is utilized, it should be justified and made available to all intervening parties.</li> </ul>
7 - Coal Price nominal dollars \$/MMBtu	<ul style="list-style-type: none"> <li>Forecasts utilized should align with scenario and/or sensitivity descriptions; Coal prices should include transportation costs.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">EIA Coal Production and Minemouth Prices by Region</a></li> <li><a href="#">EIA Annual Energy Outlook</a></li> <li>EIA Table 3: Energy Prices</li> <li><a href="#">EIA Short-Term Energy Outlook</a> Reports/Annual Reports</li> <li>If utility-specific data is utilized, it should be justified and made available to all intervening parties.</li> </ul>
8 - Fuel Oil Price nominal dollars \$/MMBtu	<ul style="list-style-type: none"> <li>Forecasts utilized should align with scenario and/or sensitivity descriptions.</li> </ul>	<ul style="list-style-type: none"> <li>If utility-specific data is utilized, it should be justified and made available to all intervening parties.</li> </ul>

9 - EWR Savings MWhs	<p>Scenario #1:</p> <ul style="list-style-type: none"> <li>For electric utilities earning a financial incentive, base case energy reductions of 1.5% per year as a net to load/forecast.</li> <li>For non-incentive earning electric utility, mandated annual incremental savings (1.0%) as a net to load.</li> <li>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 PA 342 Section 1 (3).</li> </ul> <p>Scenario #1 Sensitivities:</p> <ul style="list-style-type: none"> <li>For savings beyond mandate, incorporate EWR as an optimized generation resource.</li> </ul> <p>Scenario #2:</p> <ul style="list-style-type: none"> <li>Ramp up EWR savings at least 2.0% over the course of four years.</li> <li>Consider load shape of EWR measures so on-peak capacity reduction associated with EWR can be reflected.</li> </ul>	<ul style="list-style-type: none"> <li>Utility EWR plan and reconciliation filings</li> <li><a href="#">2021 Energy Waste Reduction Potential Study</a></li> <li><a href="#">Other pertinent studies and research used by the utility.</a></li> </ul>
10 - EWR Costs nominal dollars per kWh  (Program administrator costs only; participant costs are not to be included in this analysis.)	<ul style="list-style-type: none"> <li>Current average levelized costs as defined in 2021 EWR Potential Study and Supplemental Modeling reflecting aggressive and cost-effective program savings goals.</li> </ul>	<ul style="list-style-type: none"> <li>Utility EWR plan and reconciliation filings</li> <li><a href="#">2021 Energy Waste Reduction Potential Study</a></li> <li><a href="#">Other pertinent studies and research used by the utility.</a></li> </ul>
11 - DR Savings MWs	<ul style="list-style-type: none"> <li>MWs by individual program (e.g., residential peak pricing, residential time-of-use pricing, residential peak time rebate pricing, residential programmable thermostats, residential interruptible air, industrial curtailable, industrial interruptible, etc.) or program type and class (e.g., residential behavioral, residential direct control, commercial pricing, volt/Volt-Amp Reactive (VAR) optimization).</li> <li>Technical, economic, and achievable levels of DR as applicable to the scenario.</li> </ul>	<ul style="list-style-type: none"> <li>As defined by <a href="#">2021 Demand Response Potential Study</a></li> </ul>
12 - DR Costs nominal dollars per MW	<ul style="list-style-type: none"> <li>Costs/MW by program including all payments, credits, or shared savings awarded to the utility through regulatory incentive mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>As defined by <a href="#">2021 Demand Response Potential Study</a></li> </ul>
13 - Renewable Capacity Factors		<ul style="list-style-type: none"> <li>If utility-specific data is utilized, it should be justified and made available to all intervening parties.</li> </ul>
14 - Renewable Capital Costs and Fixed O&M Costs nominal dollars per kWh and Renewable Fixed O&M Costs nominal dollars per kW	<ul style="list-style-type: none"> <li>Wind, solar, biomass, landfill gas</li> <li>Combined heat and power (CHP)</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">National Renewable Energy Lab's Annual Technology Baseline Report</a></li> <li><a href="#">Department of Energy's Wind Technologies Market Report</a></li> <li>Lawrence Berkeley National Lab's <a href="#">Tracking the Sun</a></li> <li>and <a href="#">Utility Scale PV Cost</a></li> <li>Assumptions based on utility experience (Michigan-specific and/or RTO - MISO/PJM)</li> <li><a href="#">2015 Michigan Renewable Resource Assessment</a></li> <li><a href="#">Department of Energy's Wind Vision Study</a></li> <li><a href="#">Department of Energy's Sunshot Vision Study</a></li> <li><a href="#">Lazard's Levelized Cost of Storage Analysis 2.0</a></li> <li>If utility is using specific data not publicly sourced, must be justified and made available to all intervening parties.</li> </ul>

15 – Other Resources	<ul style="list-style-type: none"> <li>• Changes to operation guides</li> <li>• Options which improve reliability (Storage, SVC, HVDC, CVR)</li> <li>• Utilities shall take into account small qualifying facilities (20 MW and under) and other aggregated demand-side options as part of establishing load curves and future demand. Larger renewable energy resources, combined heat and power plants, and self-generation facilities (behind-the-meter (BTM) generation) that consist of resources listed below or fossil fueled generation should be considered in modeling, either as discrete projects where such have been developed/defined, or as generic blocks of tangible size (e.g., 100 MW wind farm) where not yet defined.</li> <li>• Utility-scale (e.g., integrated gasification combined cycle, CHP, pumped hydro storage, other storage, voltage optimization)</li> <li>• BTM (customer BTM) Generation (e.g., solar photovoltaic (PV), biogas (including anaerobic digesters), CHP (combustion turbine, steam, reciprocating engines), customer-owned backup generators, microturbines (with and without cogeneration), fuel cells (with and without cogeneration), small-scale Reciprocating Internal Combustion Engine (RICE) units (with and without cogeneration))</li> <li>• Other Distributed Resources (e.g., stationary batteries, electric vehicles, thermal storage, compressed air, flywheel, solid rechargeable batteries, flow batteries).</li> </ul>	<ul style="list-style-type: none"> <li>• Assumptions and parameters other than costs that are associated with the technologies and options (such as future adoption rates) should be afforded flexibility due to those technologies' and options' presently unconventional nature. However, the utility should still show that all assumptions and parameters are reasonable and were developed from credible sources.</li> <li>• Utilities shall use cost and cost projection data from publicly available sources or the utility's internal data sources. The utility must show that their data and projection sources are reasonable and credible.</li> <li>• <a href="#">State of the Art Practices for Modeling Storage in Integrated Resource Planning.</a></li> <li>• <a href="#">Charging Ahead: Energy Storage Guide for Policymakers</a></li> <li>• <a href="#">Advanced Energy Storage in Integrated Resource Planning.</a></li> <li>• <a href="#">Energy Storage in Integrated Resource Plans</a></li> <li>• <a href="#">Michigan Energy Storage Roadmap</a></li> </ul>
16 - Wholesale Electric Prices		<ul style="list-style-type: none"> <li>• Documentation for wholesale price forecast must be provided to all intervening parties.</li> </ul>
17 – Electric Vehicle Forecasts	Scenario 1 EIA AEO Reference Case Scenario 2 half of vehicle sales are electric by 2030	<ul style="list-style-type: none"> <li>• <a href="#">EIA AEO Transportation</a></li> </ul>

## IX. Additional IRP Requirements and Assumptions

1. Prices and costs should be expressed in nominal dollars.
2. Models should account for operating costs and locational, capital and performance variations. For example, setting pricing for different tranches if justified.
3. Capacity factors should be projected based on demonstrated performance, consideration of technology improvements and geographic/locational considerations. Additional requirements for renewable capacity factors are described in the Michigan IRP Modeling Input Assumptions and Sources in the previous section of this draft.
4. For purposes of IRP modeling, forecasted energy efficiency savings should be aggregated into hourly units, coincident with hourly load forecasts, with indicative estimates of efficiency cost and savings on an hourly basis. It is this aggregation and forecast of energy efficiency, to be acquired on an

hourly basis that allows EWR to be modeled as a resource in an IRP for planning purposes.

5. Prior to modeling Scenario 1 and Scenario 2, the utilities shall consider and prescreen all the technologies, resources, and generating options listed in the Michigan IRP Modeling Input Assumptions and Sources in the previous section of this draft. These findings will then be presented and discussed via at least one stakeholder meeting with written comments from stakeholders taken into consideration. The options having potential viability are then considered in modeling.
6. Consider all supply and demand-side resource options on equal merit, allowing for special consideration for instances where a project or a resource need requires rapid deployment.
7. In modeling each scenario and sensitivity evaluated as part of the IRP process, the utility shall clearly identify all unit retirement assumptions and unless otherwise specified in the required scenarios, the utility has flexibility to allow the model to select retirement of the utility's existing generation resources, rather than limiting retirements to input assumptions.
8. The IRP should consider any and all revenues expected to be earned by the utility's asset(s), as offsets to the NPVRRs. The utility should explicitly identify revenues that are expected to be earned that are offsets to the NPVRRs and the assumptions that those revenues are based upon.

## Appendix A: Organization Participation List

- Adams BioProcess Services
- Advanced Energy Economy
- American Council for an Energy-Efficient Economy
- American Electric Power
- American Municipal Power
- American Transmission Company
- Apollo Energy
- Armada Power
- Association of Businesses Advocating Tariff Equity
- Association of Energy Engineers
- Atlantic Council
- Attorney General
- Bay City Light & Power
- Bedrock Group
- Brattle Group
- Burns & McDonnell
- Cadmus Group
- Center Point Energy
- Charge Point
- Charthouse Energy
- Citizen Utility Board of Michigan
- City of Ann Arbor
- City of Grand Rapids
- City of Marquette
- Clark Hill
- Clean Grid Alliance
- CMS Energy
- Coalitions for Energy Efficient Logistics
- Consumers Energy
- CPower Energy Manager
- Dimension Renewable Energy
- DNV GL
- Dominion Energy
- Driftless Energy
- DTE Electric
- Duke Energy
- Dykema
- Earth Justice
- Ecology Center
- Dept. of Environment, Great Lakes & Energy
- Energy Exemplar
- Environmental Law & Policy Center
- EPRI
- Fein Solutions
- Five Lakes Energy
- Ford Motor Company
- Fraser Trebilcock Davis & Dunlap
- Futures Energy Group
- Great Plains Institute
- Grand Rapids Chamber of Commerce
- Grand Rapids Resident
- Grid Lap
- Guidehouse
- Hawk Utility Consulting
- Hecate Energy
- ICF New York University

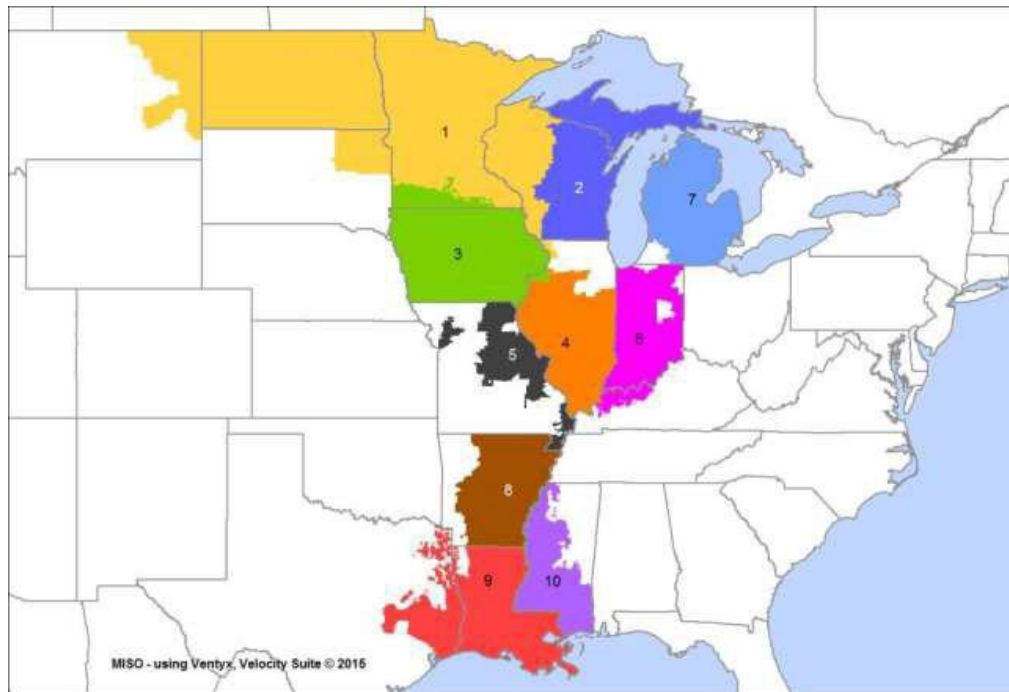
## Appendix A: Organization Participation List

- IFC
- Indiana Michigan Power
- ITC Holdings
- Key Capture Energy
- Lawrence Berkley National Laboratory
- Mi Air Mi Health
- Michigan Biomass
- Michigan Chemistry Council
- Michigan Climate Action Network
- Michigan Clinicians for Climate Action
- Michigan Conservative Energy forum
- Michigan Electric and Gas Association
- Michigan Electric Cooperative Association
- Michigan Energy Innovation Business Council
- Michigan Environmental Council
- Michigan Environmental Justice Coalition
- Michigan Farm Energy Program
- Michigan League of Conservation Voters
- Michigan Power Purchasers Association
- Michigan State University
- Michigan Townships Association
- Midcontinent Independent System Operator
- Milligan Grid Solutions
- Minnesota Public Utility Commission
- National Renewable Energy Laboratory
- Natural Resource Defense Council, Inc.
- Natural Resources Research Institute
- New Energy Advisors, LLC.
- Next Energy
- Northern States Power
- NRG Business Solutions, LLC.
- Oakridge National Laboratory
- Opower
- PACE Financing
- Pacific Northwest National Laboratory
- PJM
- Plugged in Strategies
- Policy Advisor Michigan House of Representatives
- Potomac Law Group
- PSC Healthy Energy
- Public Sector Consultants
- Public Utilities Commission of Ohio
- Purdue University Forecasting Group
- Ranger Power
- Regulatory Assistance Project

## Appendix A: Organization Participation List

- Renewable Energy Buyers Alliance
- Renewable Energy Systems
- Rivenoak Consulting
- Ruben Strategy Group
- Siemens
- Sierra Club
- Spark Building Energy Solutions
- Sun 5 Repowering
- Sunrun
- The Healthy Homes Coalition of West Michigan
- Traverse City Light and Power
- Union of Concerned Scientists
- United States Energy Association
- University of Michigan
- Soulardarity
- Upper Peninsula Power Co.
- Urban Core Collective
- US Climate Alliance
- Varum Law
- Vote Solar
- Walker Miller Energy
- Wartsila
- WEC Energy Group
- Wisconsin Public Service Commission
- Wolverine Electric Cooperative
- Wolverine Power
- Xcel Energy

## Appendix B: Map of MISO Local Resource Zones



MISO Zone 1 - Rate regulated electric utility - Northern States Power-Wisconsin

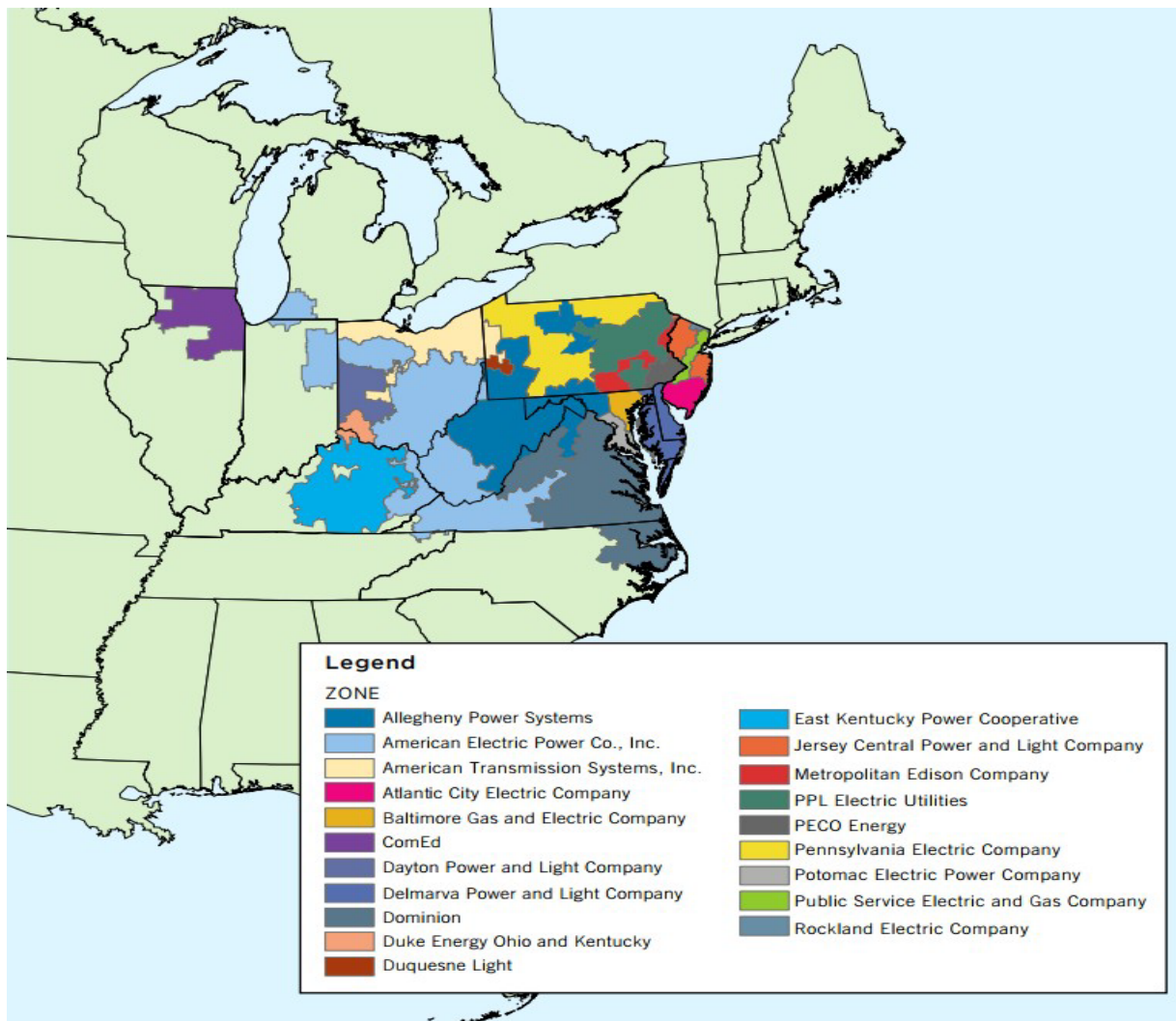
MISO Zone 2 - Rate regulated electric utilities - Upper Michigan Energy Resources Corporation and Upper Peninsula Power Company

MISO Zone 7 - Rate regulated electric utilities - Alpena Power Company, Consumers Energy Company, and DTE Electric Company

PJM (Southwest Michigan) - Rate regulated electric utility - Indiana Michigan Power Company



## Appendix C: Map of PJM Local Deliverability Areas



PJM (Southwest Michigan) - Rate regulated electric utility - Indiana Michigan Power Company is part of the American Electric Power Co., Inc.

## Appendix D: Public Act 341 of 2016, Section 6t (1)

Section 6t (1) The commission shall, within 120 days of the effective date of the amendatory act that added this section and every 5 years thereafter, commence a proceeding and, in consultation with MAE, MDEQ, and other interested parties, do all the following as part of the proceeding:

- (a) Conduct an assessment of the potential for EWR in this state, based on what is economically and technologically feasible, as well as what is reasonably achievable.
- (b) Conduct an assessment for the use of demand response programs in this state, based on what is economically and technologically feasible, as well as what is reasonably achievable. The assessment shall expressly account for advanced metering infrastructure that has already been installed in this state and seek to fully maximize potential benefits to ratepayers in lowering utility bills.
- (c) Identify significant state or federal environmental regulations, laws, or rules and how each regulation, law, or rule would affect electric utilities in this state.
- (d) Identify any formally proposed state or federal environmental regulation, law, or rule that has been published in the Michigan Register or the Federal Register and how the proposed regulation, law, or rule would affect electric utilities in this state.
- (e) Identify any required planning reserve margins and LCRs in areas of this state.
- (f) Establish the modeling scenarios and assumptions each electric utility should include in addition to its own scenarios and assumptions in developing its IRP filed under subsection (3), including, but not limited to, all of the following:

## Appendix D: Public Act 341 of 2016, Section 6t (l)

- (i) Any required planning reserve margins and LCRs.
- (ii) All applicable state and federal environmental regulations, laws, and rules identified in this subsection.
- (iii) Any supply-side and demand-side resources that reasonably could address any need for additional generation capacity, including, but not limited to, the type of generation technology for any proposed generation facility, projected EWR savings, and projected load management and DR savings.
- (iv) Any regional infrastructure limitations in this state.
- (v) The projected costs of different types of fuel used for electric generation.
- (g) Allow other state agencies to provide input regarding any other regulatory requirements that should be included in modeling scenarios or assumptions.
- (h) Publish a copy of the proposed modeling scenarios and assumptions to be used in IRPs on the Commission's website.
- (i) Before issuing the final modeling scenarios and assumptions each electric utility should include in developing its IRP, receive written comments and hold hearings to solicit public input regarding the proposed modeling scenarios and assumptions.

### Environmental Regulation Timeline

This timeline illustrates the progression of environmental regulations and court decisions from 2014 to 2028, focusing on air quality and emissions trading.

**2014**

- Every March 31: Annual Greenhouse Gas Reporting Requirement
- Oct. 2014: 316(b) Cooling water intake rule becomes effective
- Aug. 2014: Final 316(b) Cooling Water Intake Rule

**2015**

- Jan 2015: Phase I CSAPR annual emissions trading program begins
- April 2015: Michigan 1-hr SO<sub>2</sub> attainment plan for Wayne County due to EPA
- April 2015: Final CCR Rule
- April 2015: MATS compliance deadline for existing sources (except those given 1 year)
- May 2015: Phase I CSAPR ozone season emissions trading program begins
- June 2015: US Supreme Court rules EPA should have considered costs in MATS rulemaking
- Oct. 2015: Final NSPS for CO<sub>2</sub> emissions from new fossil fuel plants
- Oct. 2015: Final Clean Power Plan
- Oct. 2015: New ozone standard
- Nov 2015: Final SEEG Guidelines
- Dec 2015: EPA issued supplemental finding that costs did not negate need for MATS rule

**2016**

- Jan 2016: Regional Haze progress report submitted by state
- Feb 2016: U.S. Supreme Court stays the Clean Power Plan
- April 2016: MATS compliance deadline for remaining sources
- May 2016: EGLE submits 1-hr SO<sub>2</sub> attainment plan to EPA; includes Rule 430
- Sept. 2016: Round 2 1-hr SO<sub>2</sub> standard designations – Southern St. Clair County designated nonattainment
- Sept. 2016: CSAPR update finalized
- Dec. 2016: Final Regional Haze Rule clarifying state plan requirements
- Dec. 2016: Water Infrastructure Improvements for the Nation
- Dec. 2016: Amendment to GHG Reporting Rule

**2017**

- Jan 2017: Phase II CSAPR annual emissions trading program begins
- March 2017: Executive Order directing EPA to Review the Clean Power Plan
- May 2017: Phase II CSAPR ozone season trading program begins
- Aug. 2017: EPA provided notice to potentially revise the BTA effluent limitations
- Aug. 2017: Alpena and Delta Counties designated attainment for the 1-hr SO<sub>2</sub> standard
- Oct. 2017: Court of Claims judgement disallowing Rule 430 (part of Wayne County SO<sub>2</sub> attainment strategy); without it could not attain; EPA begins FIP process
- Oct. 2017: Michigan's Regional Haze Progress Report sent to EPA for direct final approval

**2018**

- Jan 2018: Effective date of amendment to GHG Report Rule (passed Dec 2016)
- March 2018: 1-hr SO<sub>2</sub> attainment plan due for St. Clair
- July 2018: 316(b) Rule; all permits going forward must be submitted according to 125.95
- July 2018: EPA finalizes some revisions to 2015 rule for CCR disposal in landfills and surface impoundments to provide states with approved permit programs under WIIIN (Part 257)
- Aug. 2018: EPA proposes the Affordable Clean Energy Rule
- Oct 2018: Wayne County 1-hr SO<sub>2</sub> attainment date
- Dec. 2018: NREPA Part 115 amended to include majority of RCRA Rule

**2019**

- Aug. 2018: EPA designates the 7-county SE MI, Muskegon, and Allegan (partial) Counties, and Berrien County nonattainment for 2015 ozone standard
- June 2019: EPA finalizes the Affordable Clean Energy Rule and repeals the CPP

**2020**

- May 2020: Finding that it is not appropriate and necessary to regulate HAPs and Hg CAA Section 112 (MATS)
- July 2020: EGLE submits Clean Data Determination - Southern St. Clair County waiving SIP requirement
- Aug. 2020: EPA finalized SEEG Rule for FGD wastewater and BA Transport water
- Sept. 2020: EPA finalizes amendments to Part 257
- Nov. 2020: EPA published final CCR Part B Rule

**2021**

- Jan 2021: United States D.C. Circuit Court vacates Affordable Clean Energy Rule and remands it back to EPA
- March 2021: EPA finalized revised CSAPR Update (2008 ozone standard); reducing emissions budgets (and NO<sub>x</sub> allowances) for 12 states including MI beginning with 2021 ozone season
- April 2021: Deadline for CCR unit to cease receipt of waste and initiate closure
- July 2021: Second Regional Haze Update due to EPA
- Aug. 2021: Marginal ozone attainment date and plan submittal date for 2015 ozone standard
- Aug. 2021: EGLE submits Regional Haze SIP for second planning period
- Aug. 2021: EPA published announcement on intent to revise SEEG rule again
- Sept. 2021: St. Clair County 1-hr SO<sub>2</sub> attainment date
- Oct. 2021: Earliest compliance date for SEEG Rule

**2022**

- Feb 2022: EPA proposed FIP ("Transport Rule") to help states resolve "Good Neighbor" obligations for the 2015 ozone standard. Rule to establish allowance-based trading program with NO<sub>x</sub> emission budgets for fossil-fueled plants in 25 states (including Michigan)
- Feb 2022: US Supreme Court hears arguments in West Virginia vs. EPA
- March 2022 - EPA proposes redesignation of SE Michigan 2015 ozone nonattainment area to attainment
- April 2022 - EPA proposes to determine that SE and western Michigan counties did not attain the 2015 ozone standard by the attainment deadline and proposes reclassification from marginal to moderate nonattainment
- June 2022 - US Supreme Court issues ruling in West Virginia vs EPA
- Oct 2022 - EPA finalizes determinations of attainment for 2015 ozone standard; west Michigan counties are reclassified moderate nonattainment. EPA indicates they will act on southeast Michigan ozone nonattainment area in a later action
- Oct 2022 - EPA finalizes Wayne County SO<sub>2</sub> nonattainment area Federal Implementation Plan

**2023**

- Spring/Summer 2023: Anticipating proposed CO<sub>2</sub> regulations for existing power plants (CPP/ACE rule replacement)

**2024**

- Dec. 2025: Latest compliance date for SEEG Rule

**2025**

- Dec. 2025: Latest compliance date for SEEG Rule

**2026**

- Dec. 2028: Date by which an EGU must decommission under the voluntary incentive program for more restrictive limitations for FGD wastewaters with a longer compliance schedule

**2027**

- Dec. 2028: Date by which an EGU must decommission under the voluntary incentive program for more restrictive limitations for FGD wastewaters with a longer compliance schedule

**2028**

- Dec. 2028: Date by which an EGU must decommission under the voluntary incentive program for more restrictive limitations for FGD wastewaters with a longer compliance schedule

## Appendix F: Acronyms

ACE: Affordable Clean Energy

AEO: Annual Energy Outlook

BA: Bottom Ash

BART: Best Available Retrofit Technology

BTA: Best Technology Available

BTM: Behind the Meter

CAA: Clean Air Act

CCR: Coal Combustion Residual

CDD: Clean Data Determination

CHP: Combined Heat and Power

CON: Certificate of Necessity

CO<sub>2</sub>: Carbon Dioxide

CPP: Clean Power Plan

CSAPR: Cross-State Air Pollution Rule

DR: Demand Response

DSMSim™: Demand Side Management Simulator

EGLE: Department of Environment, Great Lakes, and Energy

EGU: Electric Generating Units

EIA: Energy Information Administration

ELG: Effluent Limitation Guidelines

EWR: Energy Waste Reduction

EV: Electric Vehicle

FGD: Flue Gas Desulfurization

FIP: Federal Implementation Plan

## Appendix F: Acronyms

GIA: Generator Interconnection Agreement

Guidehouse: Guidehouse Inc

HAP: Hazardous Air Pollutants

HVDC: High Voltage Direct Current

IRP: Integrated Resource Plan

LCR: Local Clearing Requirement

LOLE: Loss of Load Expectation

LRZ: Local Resource Zones or Zones

MACT: Maximum Achievable Control Technology Standards

MAE: Michigan Agency for Energy

MATS: Mercury and Air Toxic Standards

MDEQ: Michigan Department of Environmental Quality

MEPA: Michigan Environmental Protection Act

MIRPP: Michigan Integrated Resource Planning Parameters

MISO: Midcontinent Independent System Operator

MMR: Michigan Mercury Rule

MPSC: Michigan Public Service Commission or Commission

MW: Megawatts

MWh: Megawatt Hour

NAAQS: National Ambient Air Quality Standards

NO<sub>x</sub>: Nitrogen Oxide

NPDES: National Pollutant Discharge Elimination System

NPVRR: Net Present Value Revenue Requirement

NREL: National Renewable Energy Laboratory

## Appendix F: Acronyms

NREPA: Natura Resources and Environmental Protection Act

NSPS: New Source Performance Standards

PA: Public Act

Ppb: Parts per Billion

PURPA: Public Utility Regulatory Policies Act

PV: Photovoltaic

QF: Qualifying Facility

RCRA: Resource Conservation and Recovery Act

RICE: Reciprocating Internal Combustion Engine

RTO: Regional Transmission Organization

SEEG: Steam Electric Effluent Guidelines

SIP: State Implementation Plan

SO<sub>2</sub>: Sulfur Dioxide

SRM: State Reliability Mechanism

UCT: Utility Cost Test

USEPA: United States Environmental Protection Agency

USWAG: Utility Solid Waste Activities Group

VAR: Volt- Amp Reactive

WIIN: Water Infrastructure Improvements for the Nation


# PROOF OF SERVICE

STATE OF MICHIGAN )

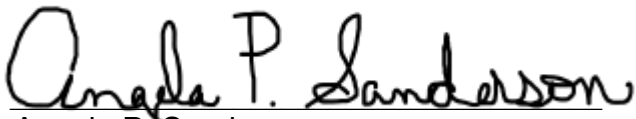
Case No. U-21219

County of Ingham )

Brianna Brown being duly sworn, deposes and says that on October 27, 2022 A.D. she electronically notified the attached list of this **Commission Order via e-mail transmission**, to the persons as shown on the attached service list (Listserv Distribution List).

  
Brianna Brown

Subscribed and sworn to before me  
this 27<sup>th</sup> day of October 2022.



Angela P. Sanderson  
Notary Public, Shiawassee County, Michigan  
As acting in Eaton County  
My Commission Expires: May 21, 2024



**Service List for Case: U-21219**

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**Name**

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**Email Address**

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