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# Revised Integrated Resource Plan Filing Requirements

U-21570 & U-21867

Pursuant to Public Act 341 of 2016, Section 6t

August 15, 2025

## Application Instructions for Integrated Resource Plan Filings

These application instructions apply to a standard electric utility application for Michigan Public Service Commission (MPSC or Commission) approval of an Integrated Resource Plan (IRP) under the provisions of MCL 460.6t, as well as an IRP that may be filed under the provisions of MCL 460.6s.[1] The application shall be consistent with these instructions, with each item labeled as set forth below. Any additional information considered relevant by the utility may also be included in the application.

## Schedule

A utility shall coordinate with the Commission Staff (Staff) in advance of filing its application to avoid resource challenges with IRP applications being filed at the same time as IRP applications filed by other utilities. A utility may be requested to delay its IRP application to preserve a 21-day spacing between IRP applications.

Following the initial IRP applications, the utilities shall comply with all future filing deadlines directed by the Commission and shall continue to coordinate with the Staff to schedule future IRP application filing dates.

## Filing Announcement

To facilitate the scheduling and preparation of IRP proceedings, a utility shall file a filing announcement in a new docket at least 30 calendar days prior to the expected or scheduled filing date. A utility who intends to file an IRP on a date other than its scheduled filing date, shall file a filing announcement, in a new docket, at least 30 calendar days prior to the proposed filing. The filing announcement, along with a proof of service, shall be served on all parties granted intervention in the utility's last IRP case and the utility's last electric rate case. If the IRP described in the filing announcement is not filed within 120 days after filing of the announcement, the filing announcement will be considered withdrawn. The IRP filing announcement will also serve as the CEP filing announcement. If a certificate of necessity (CON) is also being filed; the same filing announcement will serve as the filing announcement

[1] Variations from the standard instructions may occur as allowed by MCL 460.6t(4) for multistate utilities and those serving fewer than 1 million Michigan customers.

required for the CON.

The filing announcement shall include:

a) Statement of intent to file an IRP;
b) Estimated date of filing;
c) Information related to any stakeholder engagement meetings that have already taken place or are scheduled to take place;
d) Information related to any CON application that would be filed with the utility's IRP; and
e) Information related to the CEP that will be filed with the utility's IRP.[2]

The Commission may, if necessary, order a delay in filing an application to establish a 21-day spacing between filings. The filing announcement shall be submitted at least 30 calendar days prior to the IRP application, thus providing the Commission sufficient time to issue an order regarding the 21-day spacing, if it so chooses.

## Pre-Filing Request for Proposals

Each electric utility whose rates are regulated by the Commission shall issue a request for proposal (RFP) to provide any new supply-side capacity resources needed to serve the utility's reasonably projected electric load, applicable planning reserve margin, and local clearing requirement for its customers in this state, as well as customers located in other states but served by the utility, during the initial three-year planning period to be considered in each IRP to be filed, as outlined in MCL 460.6t.

The utility shall comply with the following:

a) The utility shall include with the IRP application documentation demonstrating that the RFP process was completed;
b) The utility's RFP process is subject to audit by the Staff;
c) The IRP filing shall include evidence that the pre-filing RFP process was conducted in a manner consistent with the Commission's code of conduct, and applicable state, federal,

[2] Utility Clean Energy Plans should follow the guidance outlined in the Clean Energy Plan Filing Requirements.

and Commission rules, and any adherence with the competitive procurement guidance in Case No. U-20852;

d) The RFP shall allow for proposals of sizes smaller than the total capacity need such that a combination of projects is needed, including but not limited to distribution connected resources, to provide new supply-side capacity, pursuant to MCL 460.6t(6); and
e) The RFP shall allow for proposals to provide new supply-side capacity in the form of a Power Purchase Agreement for a period that is the lesser of the study period or the useful life of the resource type proposed.

## Engagement and Public Outreach Process

Participant engagement early in the development of the IRP is strongly encouraged to: (1) educate potential participants on utility plans; (2) utilize a transparent decision- making process for resource planning; (3) create opportunity to provide feedback to the utility on its resource plan; (4) encourage robust and informed dialogue on resource decisions; (5) reduce utility regulatory risk by building understanding and support for utility resource decisions; and (6) ensure the inclusion of diverse voices, including environmental justice communities and Tribal governments. The utility may choose to incorporate some, or all, of the participant input in its analysis and decision-making for the IRP filing. CEP participant engagement may be combined with the IRP participant engagement to the extent practical.

In the 12 months prior to the IRP filing, each utility is encouraged to host update workshops with interested participants. The purpose of the pre-filing workshop(s) is to ensure that participants have an opportunity to provide input and stay informed regarding: (1) the assumptions, scenarios, and sensitivities; (2) the progress of the utility's IRP process; and (3) plans for the implementation of the proposed IRP. Documentation demonstrating the public outreach process undertaken by the utility shall be included with the IRP filing and the utility is encouraged to share these documents with the public. Documentation should include:

a) Workshop dates and times, including times outside of the workday;
b) Evidence that a notice of the workshops was provided to the public;
c) Meeting minutes;
d) Meeting or workshop attendance lists;

e) Participant comments on the last approved IRP and/or inputs into the proposed IRP application;
f) Description of how the public outreach process influenced the IRP; and
g) Description of community outreach efforts for environmental justice communities and Tribal governments whose land base or service territory overlays with the Company's service territory. Environmental justice communities should be identified using the MI EJScreen Tool.

A minimum of two engagement workshops is recommended. An engagement workshop will give interested persons an opportunity to provide input regarding the utility's assumptions, inputs, and modeling methodologies employed during the development of the IRP. The utility is encouraged to provide basic information regarding the IRP filing process and how interested persons could participate. The utility is encouraged to invite interested persons, including Tribal governments, expected intervenors, and the Staff, to its engagement workshops.

If the engagement workshops are not open to the public, two additional hybrid public meetings with the option for both virtual and in-person attendance are recommended. If 5% or greater of a utility's residential customers are in communities identified as part of the Environmental Justice (EJ) analysis, it is recommended that at least one of the two additional hybrid public meetings are located in any of the identified communities. The public meetings are intended to educate the public on the utility's planning process as well as provide an opportunity for the public to comment. The utility is encouraged to provide basic information regarding the IRP filing process and how interested persons and members of the public could participate. The public meetings should be offered in the utility's service territory in geographic locations that are convenient ~~to~~ for customers, prioritizing accessibility and convenience for customers identified in the EJ analysis. Advanced notice should be provided to customers in the utility's service territory. This should include Tribal governments, local governments, and community-based organizations. The utility is encouraged to consider holding public meetings after normal business hours to encourage attendance.

The public meetings should be conducted in a manner accessible to those with disabilities, including those that are hearing and visually impaired. The public meetings should also be available to those whose first language is not English upon request and to the extent practicable.

If the utility chooses to hold pre-filing workshops, including engagement workshops or public meetings, the utility shall prepare a public outreach report to document the outcomes of any pre-filing workshops, and shall file the report with the IRP application.

All presentations, recordings, comments, and transcripts from those presentations open to the public should be maintained on a website in a location open to the public for the duration of the outreach process and the duration of the IRP case, until a final commission order is published.

## Risk Assessment Methodology

The utility's IRP filing shall include a thorough risk assessment of the proposed resource plan and the optimal plans for each of the scenarios specified in the Michigan Integrated Resource Planning Parameters (MIRPP), all additional utility-developed scenarios and utility-developed sensitivities related to early retirement that are filed with the IRP application. The utility-submitted alternative build plans should be feasible and differ in generation mix from the proposed resource plan and MIRPP plans.

The intent of the risk assessment is to test the optimized resource strategies for each scenario and the proposed course of action (PCA) to determine how each strategy would perform in an unexpected range of possible futures. The utility shall provide detail on how the risk assessment was conducted, including the impact of atypical weather conditions that occur at least as frequently as once in ten years.[3,4,5] The utility shall also include all extreme weather events of the last 20 years, identified by State declaration of an emergency. Additionally, the utility should detail any scenario and sensitivity runs conducted with the utility's risk assessment where the PCA or proposed alternative build plan results in unserved load. Utilities are encouraged to link variables that can be shown to have correlation or dependencies with each other. Examples of variables to be considered under weather conditions include but are not limited to changes in load, operations, and resource availability.

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[3] Summary Climate Information, https://glisa.umich.edu/summary-climate-information/
[4] Tools for Tracking Climate Change, https://ccr.nelson.wisc.edu/
[5] Atypical weather conditions are weather events that meet the definition of "catastrophic conditions" from the MPSC Service Quality and Reliability Standards less the periods with a State declaration of emergency

The IRP shall include a discussion of the methodology used for risk assessment, including the utility's justification for the chosen methodology over other alternatives. Acceptable forms of risk assessment include, but are not limited to, the following: scenario analysis, global sensitivity analysis, stochastic optimization, generating near-optimal solutions, agent- based stochastic optimization, mean-variance portfolio analysis, and Monte Carlo simulation.

Utilities with one million customers or more, shall include a Local Reliability Requirement (LRR) analysis of the proposed resource plan in the IRP filing. The LRR analysis shall estimate a five-year outlook of the LRR in the local resource zone. The analysis shall be conducted consistent with the resource adequacy construct used by the regional transmission organization (RTO) or independent system operator (ISO). The purpose of this calculation is to estimate the marginal impact of the utility's proposed resource plan on the resource adequacy of the local resource zone during the first five years of the plan.

## Confidential Information

Transparency and the use of data that can be shared with the Commission, the Staff, and intervenors is encouraged. Proprietary, confidential, and other nonpublic materials used in the development of the forecasts, scenarios, or other aspects of the IRP shall be presented in such a way that the proprietary and confidential nature of the materials is preserved. The use of publicly available data and materials is encouraged in lieu of proprietary and confidential materials and claims that information is proprietary or confidential should be justified by the utility.

Inclusion of specific materials in the IRP filing may be contingent upon appropriate confidentiality agreements and protective orders. Proprietary, confidential, and other nonpublic materials filed as part of the IRP shall be clearly designated by the utility as confidential.

## Definitions

The following definitions are provided to aid in ensuring consistency across planning processes.

Distributed Energy Resources - A source of electric power and its associated facilities that is connected to a distribution system. Distributed Energy Resources (DER) includes both generators and energy storage technologies capable of exporting active power to a distribution system.

Non-Wires Alternatives - An electric grid investment or project that uses distribution solutions such as DER, energy waste reduction (EWR), demand response (DR), and grid software and controls, to defer or replace the need for distribution system upgrades.

Environmental Justice Communities – Refers to overburdened, vulnerable, underserved, or disadvantaged communities that are identified, for the purpose of this analysis, by a minimum percentile of 75 in the Michigan Environmental Justice Screening Tool (MiEJScreen). If MiEJScreen tool is not available, the utility should work with and take feedback from Staff, EGLE, and interested parties when determining which other tool or methodology to use.

Environmental Justice Analysis – Refers to the identification of and assessment of impacts to Environmental Justice Communities, as well as the identification of communities with a minimum percentile of 75 in either the Low Income Population or Black, Indigenous, People of Color population layers in the MIEJScreen tool.

Demand-Side Resources - Resources serving resource adequacy needs by reducing or shifting load, which reduces the need for additional generation, including but not limited to EWR, DR, grid and software controls, behind-the-meter distribution connected storage, etc.

Co-Benefits – Benefits that are quantified as part of another planning process that are important for the justification of a resource included in the IRP. Examples include a cost reduction to the distribution system or transmission system that has been evaluated in the distribution planning or transmission planning process.

## Approval of Costs

For the Commission to specify the costs to be approved for the construction of or significant investment in supply or demand-side resources, or contractual agreements, excluding short-term market capacity purchases to meet state reliability mechanism capacity requirements, in accordance with MCL 460.6t(11) through (12), the following information, data, and documents shall be provided:

For specific supply-side resources (inclusive of storage technologies), that are planned to commence within three years following the approval of the IRP, the following evidence (covering the lifespan of the project) shall be provided:

a) A description of the plant size, type, and summary of engineering/design specifications. The description shall also include the following:
    1. Description of fuel use, both primary and back-up, and provisions for transporting and storing fuel;
    2. Projected annual costs, in accordance with the breakdown specified in the Federal Energy Regulatory Commission Uniform System of Accounts; and
    3. Annual depreciation on the capital investment.
b) Projected annual return and income taxes on capital investment;
c) The operation and maintenance (O&M) costs over the life of the facility described as costs which are variable, in current dollars per kilowatt-hour (kWh), with expenses for fuel and non-fuel items indicated separately; and costs which are fixed, in current dollars per kilowatt (kW);
d) Projected property taxes;
e) The rates of escalation of cost, including:
    1. Capital costs;
    2. O&M costs which are variable and related to fuel;
    3. O&M costs which are variable and unrelated to fuel; and
    4. O&M costs which are fixed.
f) The total annual average cost per kWh at projected loads in current dollars for each year of the plan for the proposed facility;
g) Equivalent availability factors, including both scheduled and forced outage rates;
h) Capacity factors for each year in the planning period;
i) Operation cycle (i.e., baseload, intermediate, or peaking), identifying expected hours per year of operation, number of starts per year, and cycling conditions for each year in the planning period;
j) Heat rates (efficiency) for various levels of operation;
k) Unit lifetime, both for accounting book purposes and engineering design purposes, with explanations of differences;

l) Lead time, separately identifying the estimated time required for engineering, permitting and licensing, design, construction and pre-commercial operation date testing;
m) Potential socioeconomic impacts, such as employment, for the local region of the proposed supply-side resource, construction of or significant investment in an electric generation facility, or the purchase of an existing electric generation facility;
n) Procurement strategy, including third-party and company owned contracts, and any adherence to the most recent Commission approved Competitive Procurement Guidance; and
o) A summary description of the expected decommissioning process, costs, and how the utility intends to provide assurance of proper disposal with consideration of material salvage and recycling for proposed new resources.

Renewable Resources: The utility shall file data consistent with any approved renewable energy plan. Revenue requirement and incremental costs shall be calculated to include the following:

a) Capital, O&M costs for renewable energy systems (including property taxes and insurance for renewable energy systems);
b) Financing costs;
c) Costs that are not otherwise recoverable in base rates, including interconnection and substation costs;
d) Cost of purchased renewable energy credits (RECs) other than those purchased for non-compliance;
e) Cost of Contracts;
f) Expenses incurred as a result of governmental action including changes in tax or other laws;
g) Subtract revenues (i.e., transfer price, environmental attributes, interest on regulatory liability, etc.) through 2029;
h) Recovery to include the authorized rate of return on equity, which will remain fixed at the rate of return and debt to equity ratio that was in effect in base rates when the renewable plan was approved (only through 2029);
i) Provide the following information in relation to renewable resource cost recovery:
    1. Forecast through the end of the renewable plan period of the non-volumetric surcharge; and

2. Forecast through the end of the renewable plan period of the regulatory liability balance.

j) Procurement strategy, including third-party and company owned contracts. Address whether the procurement strategy adhered to the most recent Commission-approved Competitive Procurement Guidance; and

k) A summary description of the expected decommissioning process, costs, and how the utility intends to provide assurance of proper disposal with consideration of material salvage and recycling for proposed new renewable resources.

Energy Storage: The utility shall provide any relevant data, according to its plan to procure its share of the statewide energy storage target, established under MCL 460.1101(1). The following information shall be provided in relation to the energy storage procurement plan:

a) If the utility has not yet filed for approval to procure its proportional share of the statewide energy storage target, the utility must seek approval of these storage resources in an IRP filed no later than December 31, 2029;

b) Capital and O&M costs for energy storage systems;

c) Financing costs;

1. Procurement strategy, including third-party contracts, build transfer, or company owned. Address how the utility will adhere to the most recent Commission approved Competitive Procurement Guidance;
2. A summary description of the expected decommissioning process, anticipated costs, and how the utility intends to provide safety and assurance of proper disposal, with consideration of material salvage and recycling, for proposed new energy storage resources.

EWR: The utility shall provide the following information in relation to EWR programs cost approval and recovery (including utility providers that elect the State Administrator under the alternative compliance program, also known as the Efficiency United or EU program). For each individual program or group of programs, provide:

a) Total annual cost, energy, and capacity including:

1. Annual O&M cost for each individual portfolio of EWR programs;
2. Annual capital cost for each individual portfolio of EWR;

3. Expected cost-sharing or financial incentive granted to the utility by the Commission; and
4. How the utility included the avoided distribution costs when evaluating the most cost effective EWR amount in all IRP scenarios.

b) Calculated generation savings using annual marginal line loss rates for energy and marginal line loss rates at peak hours for capacity to determine total peak demand (MW) and energy (megawatt-hours (MWh)) reduction potential;

c) Total resource capacity (MW) and whether or not it is reported/registered to the applicable regional transmission organization (RTO) or independent system operator (ISO). If the resource is registered to an applicable RTO/ISO, then detail the resource type it is registered as.

DR, DER Programs, and other demand-side resources: The utility shall provide the following information in relation to DR programs, DER programs, and other demand-side resources cost approval and recovery. For each individual program or group of programs, provide:

a) Total annual cost including:
   1. Annual O&M cost for each individual program of DR, DER, and demand-side programs;
   2. Annual capital cost for each individual program of DR, DER, and demand-side programs; and
   3. Expected cost-sharing or financial incentive granted to the utility by the Commission.

b) Total demand reduction potential (MW), including the amount of load reduction and the expected hours of interruption per day, month, and year for each program, if applicable;
   1. Maximum single event demand reduction;
   2. Total resource capacity (MW) and whether or not it is reported/registered to an applicable RTO or ISO, then detail the resource type it is registered as;

c) Total energy reduction achieved (MWh); and

d) Description of program, including customer enrollment, technology used, and marketing plan.

## Waivers and Process for Smaller and Multistate Utilities

An electric utility with fewer than 1,000,000 customers in this state may request a waiver to any

portion of these IRP filing requirements. Any request for a waiver shall include a discussion and justification outlining why the waiver is warranted and in the best interest of its customers. Discussion and justification for the requested waiver shall include a description of the utility's current and forecasted energy and capacity needs, and its plan for meeting those needs over the upcoming 10 years.

If the utility requires resolution of a waiver request prior to filing an IRP application, the utility shall file the waiver request no less than 60 days prior to the filing of the IRP application. An electric utility with fewer than 1,000,000 customers in this state may request approval from the Commission to file an IRP jointly with other smaller utilities. Commission approval is required prior to filing a joint IRP.

A non-multistate Michigan electric utility serving fewer than 1,000,000 customers may elect to file an IRP, based on its specific circumstances, that deviates from these requirements, but that is subject to the Staff's ability to request supplemental information. The filing shall include an explanation of why the deviations are reasonable under its circumstances. The Commission shall review any such filings under the traditional "just and reasonable" standard.

Northern States Power Company-Wisconsin and Indiana Michigan Power Company are utilities located in Michigan that already file multistate IRPs in other jurisdictions. Due to the provisions in MCL 460.6t(4) regarding multistate IRPs, Northern States Power Company-Wisconsin and Indiana Michigan Power Company may utilize the IRP filing requirements of another state in accordance with those provisions. However, the Commission reserves the right to request additional information to facilitate its review of the IRP as it relates to Michigan.

## IRP Filing, Data, and Documentation

The utility's IRP filing shall demonstrate compliance with MCL 460.6t and include the following items:

a) Letter of transmittal expressing commitment to the approved resource plan and resource acquisition strategy and signed by an officer of the utility having the authority to commit the utility to the resource acquisition strategy, acknowledging that the utility reserves the

right to make changes to its resource acquisition strategies as appropriate due to changing circumstances;

b) Technical volume(s) that fully describe and document the utility's analysis and decisions in selecting its proposed resource plan and resource acquisition strategy;
c) The data and information requested in the Commission's IRP Filing Requirements included herein;
d) Any information that the Commission in its orders regarding the utility's previous IRPs or other dockets required to be provided in this present IRP. This information should also be provided to interested persons at public outreach meetings; and
e) Any other information deemed relevant by the utility.

The utility's IRP filing shall include an IRP document(s) and application information, including testimony and exhibits, that fully describes and documents the utility's analysis and decisions in selecting its proposed resource plan and resource acquisition strategy. To facilitate a similar format for each utility's application, the utility is encouraged to align its filing with this provided outline and include at least the following items:

I. Executive Summary: An IRP shall include an exhibit that serves as an executive summary, suitable for distribution to the public. The executive summary shall be an informative non-technical description of the resource plan proposed by the utility and resource acquisition strategy. The executive summary shall summarize the contents of the IRP document and shall include the following:

a) An overview of the planning period examined in the IRP analysis and application;
b) A brief introduction describing the utility, its existing facilities, new resources being proposed, and implementation strategy;
c) A summary of the state, federal, ISO, RTO resource adequacy regulations applicable to the utility;
d) A summary of the analytical approach used in the utility's analysis and the types of new resources considered;
e) A description of how the analytical approach considered potential resource co-benefits from other planning processes, such as distribution or transmission planning;
f) A summary of any retirement analysis performed;

g) A description of how the environmental justice (EJ) analysis results influenced the utility's proposed course of action (PCA);
h) The Company shall include a graph that depicts a stacked bar graph that includes the RTO/ISO capacity credit[6] of all existing resources and PCA resource additions, color designated by resource type, that it will use to serve demand in each year for all planning years. The graph shall have a line representing expected demand over the length of the planning period with the inclusion of the necessary planning reserve margin;
i) The Company shall include a graph that depicts a stacked bar graph that includes the annual energy expected to be produced by all existing resources, PCA resource additions, and market purchases for each year of the planning horizon. The graph shall be color designated by resource type. The graph shall have a line representing expected demand over the length of the planning period;
j) The Company shall include a graph(s) that summarizes the total of each of the following pollutants projected using the PCA in the MIRPP Scenario 1 for each year of the planning horizon. A graph should be included for nitrogen oxide ($NO_x$), sulfur dioxide ($SO_2$), particulate matter (PM), mercury (Hg), volatile organic compounds (VOC), carbon dioxide ($CO_2$). The graph should also depict the utility's progress toward or achievement of State, Federal and utility announced goals or requirements by including annotations for those goals on the years they apply;
k) The Company shall include a discussion of the estimated costs of the PCA; and
l) Any other information that would aid the public understanding of the utility's proposed resource plan.

II. Table of Filing Requirements:

The utility shall provide a table that clearly identifies where in the filing it has met all the filing requirements. It shall include locations in testimony, exhibits, and workpapers.

III. Testimony Introduction: The utility shall describe resource plans to satisfy at least the objectives and priorities identified in MCL 460.6t. The utility may identify and/or describe additional planning objectives that the resource plan will be designed to meet. The utility shall

[6] For example, MISO Zonal Resource Credit.

describe and document its additional planning objectives and its guiding principles to design alternative resource plans that consider the planning objectives and priorities. The introduction shall include the following:

a) General description of the utility's existing energy system, including:
    1. Net present value revenue requirements (NPVRR),[7] with and without any financial performance incentives for demand-side resources;
    2. Summary of existing generation and PPAs by fuel type;
    3. Utility's existing capacity resource mix;
    4. Utility's service territory and breakdown of customer class composition; and
    5. Description of planning period analyzed;
b) Statement of power need;
c) Identify and explain the basis for the forecasted price of energy, capacity, fuels, and of peak demand and energy requirements, over the study period used in each scenario and sensitivity evaluated by the utility as part of the IRP process;
d) Market and regulatory environment influencing resource planning decisions:
    1. RTO market and state regulation structure if a multistate utility;
    2. Potential changes to RTO capacity market;
    3. Electric customer choice;
    4. Transmission expansion;
    5. Environmental;
    6. Renewable portfolio standards; and
    7. Other;
e) IRP planning process; and
f) Engagement report.

IV. Analytical Approach:

a) Describe the modeling process, including the duration of the study;
b) The utility shall describe and identify how its model approach optimizes resources to meet load and demand for all times of the year and for each year of the planning

[7] The assumed discount rate shall be included along with a justification for the assumed discount rate. Results should be presented in nominal dollars.

horizons. The utility shall explain how the model considers the seasonal and operational characteristics of all resource types, including generation profiles, forced outages, facility derates, seasonal or limited availability of resources, etc.;

c) The PCA and Utility Alternative (if applicable) should be evaluated under all scenarios and sensitivities listed in the MIRPP;

d) If the utility presents a retirement study as justification for an early resource retirement or to delay the scheduled retirement of a fossil fuel plant, the utility should refer to the minimum scenario and sensitivities in Appendix G of the MIRPP when conducting that analysis. The previously approved retirement dates should also be evaluated under the scenarios and sensitivities indicated in Appendix G. To allow for evaluation over the same time horizons, the portion of the previously approved IRP that does not have resources, should include any new (additional) generic resources as selected by model optimization.

    1. The utility shall share the dates being studied, as well as the criteria that will be analyzed as part of the IRP, with Staff. This information will be provided in the utility's initial IRP filing.
    2. To test the optimized resource strategies for the proposed retirement, the utility shall model sensitivities to ensure the retirement dates were stress-tested and the PCA is reasonable and prudent under various conditions.
    3. Sensitivities may include, but are not limited to, high load growth, high natural gas prices, and extreme weather conditions.
    4. The utility must present the retirement analysis methodology, summarize the results, and demonstrate that the PCA is reasonable and prudent under the conditions tested. The utility must also demonstrate that the PCA complies with the renewable energy plan requirements of MCL 460.1028, the clean energy requirements of MCL 460.1051, the energy waste reduction measure in MCL 460.1077, and the energy storage target of MCL 460.1101, unless the retirement analysis is part of a request for extension of compliance with the clean energy plan under MCL 460.1051(b).
    5. If the retirement proposed as part of the PCA is not supported under one or more of the conditions or sensitivities assessed, the utility shall include in testimony how the

company plans to monitor the risk in advance of retirement as well as a risk mitigation plan.

e) If the utility is proposing the retirement of a baseload or intermediate coal or natural gas power plant with a date that differs from the most recently approved IRP:

f) Describe and provide a justification for the risk assessment approach adopted from the Risk Assessment Methodology section:

   1. The utility shall describe and document its quantification of the risk that affects the evaluation of the various resource plan options;
   2. The utility shall provide a tabulation of the key quantitative results of that assessment and a discussion of how those findings affected its decision on a resource plan; and
   3. If multiple forms of risk assessment are presented the utility shall explain why certain risk variables could not be included in or are unsuited for one type of risk assessment or another. Considering a risk variable under multiple forms of risk assessment is not discouraged.

g) The utility shall describe and document the identification of risk variables and/or combinations of risk variables selected, their ranges, probabilities, ranking, and/or weighting that defines the risk quantification which the various resource plan options were judged; describe how these risk variables were judged to be appropriate and explain how these were determined; and describe the modeling tools and data sources employed during the capacity expansion, and other modeling processes; and

h) Interactions between risk variables should be captured to the extent that it is practical. Evaluation of variables in isolation is acceptable so long as there exists a comprehensive evaluation of resource plans risks that captures interactions and shows overall risk of appropriate build plans. A comprehensive risk assessment should at least include optimized build plans from the required MIRPP scenarios, the proposed resource plan, and any alternative resource plans presented by the utility.

V. Integrated Resource Plan Scenarios and Sensitivities:

a) Include a detailed description of all scenarios and sensitivities; and

b) In addition to the utility's own scenarios and assumptions, the inclusion of the established modeling scenarios and assumptions in the MIRPP, approved by the Commission in Case

No. U-XXXXX, or as revised by subsequent Commission orders related to IRP modeling parameters and requirements.

c) The utility should show how it used the MIRPP-approved Scenarios, or any additional scenarios that the utility decides to include, to develop the PCA and any alternative build plan and to justify any retirement decisions. To the extent that some portion of the MIRPP-approved scenarios is of concern for the utility, the utility can request a waiver, in advance of the filing of the IRP, to deviate from certain aspects of a scenario or sensitivity. Examples may be to request to use a different gas price or updated EWR information.

d) Consistent with MCL 460.1051(b), if a utility has requested and been approved for an off-ramp for their REP, the IRP should align and reflect the Commission's approval. If the utility is using the results of its IRP to support a request for an off-ramp, the utility should run Scenario#1 and Scenario#2 with an additional sensitivity (sensitivities) that illustrates the resulting difference in cost and overall build plan as compared to meeting the standard without the use of an off ramp.

e) The utility should model its PCA, any utility proposed alternative, any additional scenarios the utility decides to include, and previously approved IRP build plan in all scenarios and sensitivities presented in the MIRPP.

VI. Existing Supply-Side Resources: Detailed account of projected energy and capacity purchased or produced by the utility's owned and contracted resources, including cogeneration resources. Include data regarding the utility's current generation portfolio, including the age, capacity factor, licensing status, and remaining estimated time of operation for each facility in the portfolio:

a) Overview;

b) Fossil-fueled generating units;

c) Nuclear generating units;

d) Hydroelectric generating units;

e) Renewable generating units;

f) Energy storage facilities;

g) Third-party contracts: energy and capacity purchased or produced by the utility from a contracted resource, including any cogeneration resource; and

h) RTO/ISO capacity credits and modeling of existing units (such as capacity factor, heat rate, outage rate, in-service and retirement dates, operating costs, etc.).

VII. Demand-Side Resources: Historical and projected load management and DR programs for the utility in terms of MW and RTO or ISO Zonal Resource Credits (ZRCs) and the projected costs for those programs.

a) Provide data on projected enrolled capacity and DR events for each program. The following items are to be included:
    1. Description of current DR and load management programs for the IRP study horizon, including the amount of load reductions and the expected hours of interruption per day, month, and year for each program;
    2. Review the historic performance of existing demand-side programs in delivering benefits and how the utility used such information in its DR resource decisions;
    3. Describe the utility's method for identifying and deciding whether to pursue cost-effective and achievable DR, and determining whether to purchase energy rather than relying on DR; and
    4. A description of any other programs the utility is considering that could potentially expand DR resources, including expected load reductions and operating parameters.

VIII. Renewables and Renewable Portfolio Standards Requirements: Projected energy purchased or produced by the utility from renewable energy resources.

a) Describe how the electric provider will meet existing renewable energy standards. If the level of renewable energy purchased or produced is projected to drop over the planning periods, the utility must demonstrate why the reduction is in the best interest of ratepayers;
b) Specify whether the number of MWh of electricity used in the calculation of the REC portfolio will be the previous 12-month period of weather-normalized retail sales or based on the average number of MWh of electricity sold by the electric provider annually during the previous three years to retail customers in this state;
c) Include the expected incremental cost of compliance with existing renewable energy standards for the required compliance period;

d) A description of how the electric provider's plan is consistent with the renewable energy requirements established by the Michigan Legislature (e.g. 50% renewable energy by 2030 and 60 % by 2035;
e) Describe the options for customer-initiated renewable energy that will be offered by the electric provider and forecast sales of customer- initiated renewable energy;
f) Describe how the electric provider will meet the demand for customer- initiated renewable energy, and;
g) Describe how the electric provider has included distributed generation as a resource within its modeling for both the IRP and CEP, including interconnection to utility distribution as well as behind-the-meter.

IX. Energy Storage Target: Description of how the utility will meet its proportional share of the statewide energy storage target required by MCL 460.1101(1).

a) If the utility has not yet filed for approval to procure its proportional share of the statewide energy storage target, the utility must seek approval of these storage resource in an IRP filed no later than December 31, 2029;
b) Identification of the utilities proportional share of the statewide energy storage target of 2500 MW, to be calculated using the methodology approved by the Commission in Case No. U-21751;
c) Describe the Company's storage procurement plan to meet its required share of the statewide target, including providing the following data on an annual basis:
    1. Nameplate capacity and energy output of new resource additions;
    2. Storage technology/chemistry deployed and in what amounts;
    3. Mix of energy storage capacity that is long-duration and multi-day in duration;
    4. Project costs;
    5. If the utility's energy storage plan differs from the resultant capacity expansion results, the utility should present its analysis on how it determined the optimal mix and timing of different energy storage technologies and duration capabilities to meet its share of the statewide target, including any modeling or description of other analytical approaches taken.

X. Clean and Renewable Energy Standards Section:

a) Sales forecast from the first year of the study period through 2025 toward meeting the 35% goal, and through the study period.
b) Detailed resource plan that clearly illustrates how the utility has aligned its IRP with its CEP and how the utility will meet the Clean Energy Standards of 80% clean energy by 2035 and 100% clean energy by 2040. The utility must:
    1. Describe the utility's planned REC portfolio;
    2. Forecast RECs obtained via Michigan incentive RECs;
    3. Forecast expected compliance levels by year to meet the renewable portfolio targets;
    4. Identify key assumptions used in developing these forecasts and the proposed resource portfolio; and
    5. Identify risks which may drive performance to vary.
    6. If the utility is requesting an extension of a renewable energy credit portfolio deadline pursuant to MCL 460.1032, the utility must:
        i. Provide justification for the extension.
        ii. Model at least one portfolio without an extension (i.e. what it would look like given the renewable energy deadline without the extension).

XI. Peak Demand and Energy Forecasts: A long-term forecast of the utility's sales and peak demand under various reasonable scenarios. Include details regarding the utility's plan to eliminate energy waste, including the total amount of EWR expected to be achieved annually, and the cost of the plan:

a) A forecast of the utility's peak demand and details regarding the amount of peak demand reduction the utility expects to achieve.
b) Subsections:
    1. Key variables used to develop forecast;
    2. Long-term forecasting methodology;
    3. Forecasting uncertainty and risks;
    4. Historical growth in electric sales for the previous five years, including a record of its previous load forecasts (can be supplied in workpapers);
    5. Base Case sales including assumed losses and demand forecast;

6. Alternative forecast scenarios and sensitivities in accordance with the Commission's final order in Case No. U-21219, or subsequent Commission orders relating to IRP modeling parameters and requirements;
7. Describe in detail about how the forecasts used for IRP modeling align with forecasts used for distribution planning;
8. Detail information about how the Company considered DER and non-wired alternative solutions for the potential to offset future utility-scale resources;
9. Detail electric vehicle adoption assumptions and impacts to overall peak demand and energy forecasts;
10. Detail additional electrification adoption assumptions and impacts to overall peak demand and energy forecasts; and
11. Detail exactly how much EWR is embedded in the utility's load forecasts.

XII. Capacity and Reliability Requirements: The utility shall indicate how it complies, and will comply, with all applicable state, federal, ISO, and RTO capacity and reliability regulations, laws, rules, and requirements, (such as planning reserve margins, system reliability and ancillary service requirements) including, where feasible, the projected costs/revenues of complying with those regulations, laws, and rules. The utility shall identify any relevant changes to the applicable state, federal, or local laws, rules, and regulations. The utility shall also identify any major ISO or RTO capacity and reliability requirements that have occurred since its last IRP filing, including narrative that identifies how its PCA satisfies those requirements. The utility shall include data regarding the utility's current generation portfolio, including the age, capacity factor, licensing status, and remaining estimated time of operation for each facility in the portfolio.

XIII. Transmission Analysis: In accordance with MCL 460.6t(5)(h), the utility shall work with their local transmission owner to include an analysis of potential new or upgraded electric transmission options for the utility. The utility's analysis shall include the following information:

a) The utility shall work with their local transmission owner to assess the need to construct new, or modify existing transmission facilities to interconnect any new generation and shall reflect the estimated costs of those transmission facilities in the analyses of the resource options;

b) In collaboration with the incumbent transmission owner, include an analysis of any co-benefits of storage, specifically the transmission system benefits associated with transmission interconnected storage that is not designated as "storage as transmission only asset;"
c) A detailed description of the utility's efforts to engage local transmission owners throughout the utility's IRP process. In an effort to inform the IRP process and assumptions, a meeting schedule in coordination with the transmission owner should be determined that supports engagement through the process. The filing should include a summary including meeting dates, number of meetings and how the engagement influenced the utility's decisions;
d) Detailed meeting minutes for utility/transmission owner meetings should include any requested studies, discussions about assumptions and any conclusions made during the meeting, alternatives that were reviewed, any other pertinent information that can be made public or provided through typical contested case confidentiality agreements;
e) Current transmission system import and export limits as most recently documented by the RTO and any local area constraints or congestion concerns;
f) To the extent available, any information provided by their local transmission and RTO owner indicating the anticipated effects of fleet changes proposed in the transmission system, including both generation retirements and new generation, subject to confidentiality provisions; Any information provided by their local transmission owner, including cost and timing, indicating potential transmission options that could impact the utility's IRP by: (1) increasing a local resource zone's (LRZ) import or export capability; (2) facilitating PPAs or sales of energy and capacity both within or outside the planning zone or from neighboring RTOs; (3) transmission upgrades resulting in increasing system efficiency and reducing line loss allowing for greater energy delivery and reduced capacity need; and (4) advanced transmission and distribution network technologies affecting supply-side resources or demand-side resources; (5) estimated interconnection costs for new resources (6) potential siting locations that may provide transmission system benefits;
g) In collaboration with their local transmission owner, to the extent available**,** any information regarding (1) identification of system locations or regions where energy

resources can interconnect to the transmission system with minimal transmission investment, (2) recent studies, to the extent that they are available, that indicate ways in which the capacity import or export capabilities can be increased or may change and the resulting impacts to the local clearing requirement;

h) Any transmission studies performed by their local transmission owner that support the resource plan proposed by the utility;
i) In conjunction with the local transmission owner, provide an analysis of transmission costs for access to out of state resources conducted by either the RTO, transmission owner(s), and/or utility; and
j) Provide RTO reports or web links to report locations that contain information relied upon to support transmission related model assumptions.

XIV. Fuel: The utility shall include the following:

a) Overview;
b) Natural gas price forecasts under the various scenarios;
c) Oil price forecasts under the various scenarios;
d) Coal price forecasts under the various scenarios;
e) Delivered natural gas prices to existing and new utility-owned generating plants;
f) Delivered oil prices to existing and new utility-owned generating plants;
g) Delivered coal prices to existing and new utility-owned generating plants;
h) Projected annual fuel costs under the various scenarios;
i) The projected long-term firm gas transportation contracts or natural gas storage the utility will hold to provide an adequate supply of natural gas to any new and existing generation facility; and
j) Any other fuels used for electric generation by the utility.
k) New generation or retrofitted generation costs to connect to fuel and store CO2 where applicable.

XV. Resource Screen: Describe the utility's options of resources, including combinations of resources constructed as a single facility (such as storage combined with a generation source), to serve future electric load such as utilizing existing and planned resources (including future load from the electric provider's voluntary green pricing program and any special contracts), build a new facility, purchasing capacity from the market on a short-term basis, and purchasing capacity

through a PPA. The following sections shall discuss each option in detail and options shall be considered in combination to serve future electric load. As described below, workpapers with information on the costs and performance data of each modeled resource option and combination of resource options shall be provided with the utility's filing:

a) Existing and approved resources;
b) New build:
    1. New generation technology and operating assumptions;
    2. New generation development costs;
    3. New storage technology and operating assumptions;
    4. New energy storage development costs; and
    5. Development costs and operating assumptions for combinations of resources constructed as a single facility;
c) DERs inclusive of non-wires alternatives (NWA) identified in other planning processes;
d) Demand-side Resources inclusive of NWAs identified in other planning processes;
e) Market capacity purchases:
    1. Regional market supply outlook;
    2. Availability of market capacity; and
    3. Market capacity price assumptions;
f) Long-term PPAs; and
g) Transmission resources:
    1. Overview;
    2. Existing import and export capability;
    3. Transmission network upgrade assumptions for the IRP; and
    4. Import and export impact on resource strategy.

XVI. Modeling Results: An analysis of the capital costs, energy production, energy production costs, fuel costs, energy served, capacity factor, emissions (levels and costs), and viability of all reasonable options available to meet projected energy and capacity needs, including, but not limited to, existing electric generation facilities in this state. The following suggest specific items

to be included. They are not exhaustive.

a) Description of IRP portfolio design strategy (portfolio optimized for least cost, value maximization, reliability, risk minimization, environmental specification, minimization of impacts to communities identified in the EJ analysis, etc., or a particular combination);
b) Results for all MIRPP required scenarios and sensitivities, additional utility scenarios and sensitivities, and the proposed resource plan that include annual incremental revenue requirements, incremental present value of annual revenue requirements and net present value of revenue requirements, and portfolio capacity, including additions and retirements. Include monthly and annual energy pricing, and resource capacity and load factors;
    1. Base case portfolio options to be selected from;
    2. Analysis of IRP results;
c) Risk assessment is presented with graphics and data that illustrate the results of any stochastic risk analysis performed such that the probability distributions are clearly defined along with relative positions of the distributions so that plans can be directly compared on a single graph. The use of a box and whisker plot and/or efficient frontier plot is recommended; and
d) Impacts on resource adequacy for the resource zone.

XVII. Proposed Resource Plan: Include a detailed description of:

a) The type of generation technology proposed for a generation facility or combination of resources constructed as a single facility contained in the plan and the proposed capacity of the generation facility or combination of resources constructed as a single facility, including projected fuel costs under various reasonable scenarios;
b) Plans for meeting current and future capacity needs with the cost estimates for all proposed construction and major investments, including any transmission or distribution infrastructure that would be required to support the proposed construction or investment, and PPAs;
c) The projected long-term firm gas transportation contracts or natural gas storage the utility will hold to provide an adequate supply of natural gas to any new generation facility; and
d) How the utility will meet local, state, and federal laws, rules, and regulations under the PCA;

e) The impact of the proposed course of action on the diversity of the Company's resource portfolio. Include details in a qualitative discussion;
f) How the utility's IRP and CEP align with or differ from the Company's most recently filed Renewable Energy Plan (REP). If the IRP and CEP diverge from the REP, describe how they will meet the Renewable Energy Portfolio Standard set out in PA 235 and how these differences will influence future REP filings;
g) How the utility's IRP storage builds meet the utility's share of the Energy Storage Target as set out in PA 235; and
h) How the utility's IRP aligns with or differs from the utility's most recent EWR plan and how the EWR in the PCA complies with PA 295 as amended.

XVIII. The utility shall describe the process used to select the proposed resource plan, including the planning principles used by the utility to judge the appropriate tradeoffs between competing planning objectives and between expected performance and risk. The utility shall describe how its proposed resource plan satisfies the following:

a) Strike an appropriate balance between the various planning objectives specified;
b) Utilize renewable and demand-side resources to comply with existing laws, goals and, in the judgment of the utility, are consistent with the public interest to achieve state energy policies;
c) In the judgment of the utility, the proposed resource plan, in conjunction with the deployment of DR measures, has sufficient resources to serve load forecasted for the implementation period;
    1. A NPVRR comparison of its proposal and reasonable alternatives over the planning period utilized in the analysis. It shall also include the calculation and comparison of the NPVRR of the utility's proposed resource plan and any alternative resource plans, including the alternative resource plans resulting from the Commission-approved modeling scenarios.
    2. A detailed analysis of any benefits from resources that provide co-benefits to distribution or transmission planning (such as reliability and resiliency benefits), when those benefits are unable to be captured through capacity expansion modeling runs, to the extent that the co-benefits were relied upon for justification of resource decisions;

d) Include a detailed analysis for any resource type that the utility utilized an analysis outside of the integrated resource model to determine net-cost, external benefits, and additional value streams:
    1. Detail the net-cost method used when modeling any resource, where presumed benefits are netted against the costs of a resource to account for benefits outside of the model. A complete account of costs and assumed benefits should be provided such that the metrics and value given to achieving those metrics is clear and transparent;
    2. Detail benefits and value streams that are outside of the model that are included in the utility justification for a resource. A detailed analysis should be transparently included in the utility filing; and
    3. Detail how the utility considered whether benefits applied to one resource type are or are not also attributable to other resources.

XIX. The utility shall develop an implementation plan that specifies the major tasks, schedules, and milestones necessary to implement the proposed resource plan over the implementation period. The utility shall describe and document its implementation plan, which shall contain:

a) A schedule to report the status of an approved plan in accordance with MCL 460.6t(14);
b) A schedule and description of actions to implement ongoing and planned demand-side programs and demand-side rates;
c) A schedule and description of relevant supply-side resource research, engineering, retirement, acquisition, and construction;
d) A description of how, to the extent practical, the construction or investment in new resources in this state will be completed using a workforce composed of residents of this state;
e) A description of, to the extent practical, the construction of new resources in this state will be completed using materials sourced from this state; and
f) A description of how the utility plans to meet the labor standards set out in PA 231 Section 6t(8)(c) for the construction of new generation capacity and rehabilitation of existing capacity resources.

XX. Rate Impact, Financial Information, and Affordability: PCA only rate and affordability

impact.

a) The average rate impact by customer class (i.e., residential, C&I, etc.). The analysis shall include the Utility's most recently approved base rate revenue requirement for full-service customers, a forecast of the revenue requirement growth based on a projected inflation factor, the percentage of the production cost allocations assignable to each customer class, based on the prior approved rate case, and the estimated delta revenue requirement of the PCA to determine the average rate impact.
    1. The Utility shall identify the class allocation of the incremental revenue requirement, the class sales forecast and compare it to the current average rate, and class allocation of the incremental revenue requirement shown as a percentage.
    2. This rate impact analysis should also include the impact to customers as a result of PCA resources that are cost recovered using the PA 235, Section 22 revenue recovery mechanism.
b) The utility shall show the affordability impact of the PCA as compared to its previously approved build plan. The utility shall describe its methodology and data sources including but not limited to income-based segmentation, publicly available data used, any limitations of data availability, proxies such as demographics or housing data, etc. Example methodology is in Appendix 2. If any identified income range is expected to increase an energy burden at or above 6%, the utility shall provide a discussion of available assistance, EWR programs and measures, or other options that could aid in mitigating the expected increased energy burden for the areas identified.[8]

XXI. The utility shall describe the financial assumptions and models used in the plan. The resource plan shall include, at a minimum, the following financial information, together with

[8] This affordability analysis is based on publicly available data as of the time of filing. It relies on generalized assumptions and broad-based inputs to evaluate the affordability implications of the PCA in this IRP. The results are intended to inform the Commission's evaluation of long-term electric supply planning decisions in this IRP. This analysis serves as one step in advancing affordability considerations in resource planning and considers the impacts of resource investment only.

supporting documentation and justification:

a) The general rate of inflation;
b) The allowance for funds used during construction rates used in the plan;
c) The cost of capital rates used in the plan (debt, equity, and weighted) and the assumed capital structure;
d) The discount rates used in the calculations to determine present worth;
e) The tax rates used in the plan;
f) NPVRR for the plan;
g) Nominal incremental revenue requirements by year; and
h) Average system rates per kWh by year.

XXII. Environmental Considerations and Environmental Justice: Describe how the utility's resource plan and any alternative resource plans presented in the application will comply with all applicable local, state, and federal environmental regulations, laws, and rules.

a) Include a list of all environmental regulations that are applicable to the utility fleet. Identify which regulations apply to which resources;
b) Include all capital costs for compliance with new and reasonably expected environmental regulations for existing fleet assets in the utility IRP;
c) Include a chart that compares the total projected carbon emissions under each scenario analyzed (no sensitivities applied), including quantifying the carbon emissions projected in each sensitivity as a percentage of the carbon emissions presented in the base scenario associated with that sensitivity. The utility shall identify and justify its use of a carbon accounting methodology, identified in Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases or other Commission approved methodology;[9]
d) If the Company is proposing retirement of an existing resource due to an environmental regulation, clearly identify the future capital cost for environmental regulations and other capital investments in the facility. If costs are identified as avoided capital costs, provide

[9] Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases, https://ghginstitute.org/wp-content/uploads/2019/04/EPRI-Wholesale-Power-Report-Published-2019.pdf, March 2019.

sufficient detail to support the capital cost as avoidable, meaning dollars will never be spent, or capital cost will simply be transferred to another cost category. For example, becoming cost of removal, or fully avoidable capital costs;

e) Hold a technical conference with MPSC and Department of Environment, Great Lakes, and Energy (EGLE) staff within 30 days after the filing to discuss the environmental and emission related data included in the filing testimony, exhibits, and workpapers; and

f) Identify, quantify, and provide evidence in the filing that shows progress in meeting any state, federal or utility announced carbon reduction goals. Illustrate how each optimized build plan for each MIRPP scenario (no sensitivities applied), the proposed resource plan, and the previously approved plan perform in meeting those goals throughout the planning period.[10][11]

XXIII. EGLE Advisory Opinion and Environmental Justice Analysis: Ensure the advisory opinion of EGLE in utility IRP cases is supported by a comprehensive health and environmental impact analysis in support of the State's environmental justice goals and Governor Whitmer's September 2020 Executive Directive 2020-10.

a) Scope of portfolio build plans (herein referred to collectively as portfolios) evaluated as follows:
    1. Portfolio 1: Previously approved portfolio (status quo; PCA in previously approved IRP) run in the MIRPP Scenario 1 (optimized through the current study period);
    2. Portfolio 2: Utility PCA portfolio run in MIRPP Scenario 1;

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[10] Governor Gretchen Whitmer signed Executive Directive 2020-10 (ED 2020-10) regarding the urgent threat to the environment, economy, and the health and well-being of Michigan's residents posed by climate change and its implications. ED 2020-10 committed Michigan to pursuing a reduction of at least 26 to 28 percent in Greenhouse Gas (GHG) emissions below 2005 levels by 2025 and economy-wide carbon neutrality to be achieved no later than 2050 and maintained thereafter.

[11] April 22, 2021, President Joe Biden announced carbon reduction targets for the United States building upon carbon reductions to date. The new targets call for an economy-wide net GHG reduction of 50 to 52 percent from 2005 levels by 2030 and net zero GHG emissions economy-wide by no later than 2050.

3. Portfolio 3: Optimized portfolio in MIRPP Scenario 1;
4. Portfolio 4: Optimized portfolio in MIRPP Scenario 1 with high load sensitivity; and
5. Portfolio 5: If applicable a utility's reasonable alternative(s) to the PCA presented by the utility in MIRPP Scenario 1.

b) The utility will provide the following facility/unit level data and total annual fleet data, in an Excel spreadsheet(s) expressed in total tons, to EGLE for the following pollutants:
   1. Sulfur dioxide ($SO_2$)
   2. Nitrogen oxides ($NO_x$)
   3. Carbon monoxide (CO)
   4. Particulate matter (PM)
   5. Lead (Pb)
   6. Mercury (Hg)
   7. Volatile organic compounds (VOC)
   8. Carbon dioxide ($CO_2$)
   9. Sulfur dioxide ($SO_2$)

c) For each portfolio, identify existing facilities and potential future facilities with known locations, including peaking units, that are within 3 miles of communities specified for the Environmental Justice Analysis. Analyze all portfolios to quantitatively assess the projected emissions of identified facilities for each respective portfolio, and the differences in each portfolio's projected emissions for that unit relative to portfolio #2. Emissions should be reported in the appropriate unit of measure. If a utility does not have generation within a 3-mile radius of a community identified by the Environmental Justice Analysis, then an assessment is not required.

d) Using the facilities identified in (c), above, quantitatively assess changes to air emissions from early retirement and conversion of fossil fuel-fired facilities to the extent the plan includes either conversion or retirement.

e) Using the facilities identified in (c) above, qualitatively assess the potential impacts of all portfolios including utility proposed early retirements, retained, or converted fossil fuel-fired facilities. The assessment should address water quality, waste disposal, and

expected changes in land use for new or retiring resources to the extent known at the time of filing. The assessment should evaluate whether the utility's proposed PCA reduces harm to the health and safety of individuals in Environmental Justice Analysis communities in comparison to the alternatives considered;

f) To determine health impact estimates for air emissions, the utility will use the environmental Benefits Mapping and Analysis Program–Community Edition (BenMAP-CE), or the Co-Benefits Risk Assessment (COBRA) Health Impacts Screening and Mapping Tool. Based on the pollutant parameters compatible with the chosen tool, this air emissions data analysis will be performed to provide health impact estimates. This includes:
    1. Assessment of annual fleetwide health impacts or benefits of any of the following: early retirement of fossil fuel-fired units, conversions to a different fuel source(s), and newly constructed/acquired generation units (to the extent the location is known and including renewable energy adoption, new fossil fuel-powered generation, nuclear, etc.).[12] Using emission projections from section XXII subsection c), compare results for all portfolios with a focus on a comparison of portfolio #2 and #5 (if applicable) to portfolio #1; and
    2. County-level results (or finer) for any county that contains retired, new (if location is known), or converted fossil fuel-fired units in or within 3 miles of communities specified for the Environmental Justice Analysis.
g) Assess PM2.5 and NOx emissions from each individual electric generating unit in portfolio #2 located within 6 miles of communities specified for the Environmental Justice Analysis. If existing unit emissions for either pollutant increase above the historic variability of the unit, conduct emissions impact analyses for those units. The current emissions should be used to establish a baseline by which to compare the future impacts of portfolio #2 units. Any analysis conducted pursuant to this item should include other emissions impacts on the area, as appropriate. The goal of this analysis is to assess how

[12] If the online version of an analytical tool does not have the data needed for analyzing a year where noteworthy emission changes are expected to occur, impacts can be estimated using emission changes from a year as near as possible to the year of noteworthy emissions change. A desktop version of the analytical tool may also be used.

the PM2.5 and NOx emissions may change in communities specified for the Environmental Justice Analysis, and to encourage consideration of these impacts in the utility's decision on the PCA.

h) For resources located within the nonattainment areas (or an area that may be designated nonattainment based on reasonably known information at the time of filing) in the electric utility service territory, identify and assess their impact to the nonattainment status for the portfolio #2, listed above, as compared to portfolio #1, and qualitatively support in testimony. The assessment should consider all nonattainment pollutants (i.e., $SO_2$ and ozone), as well as their precursors (i.e., $NO_x$ and VOCs); and

i) Narrative discussion of the quantitative and qualitative health and environmental impacts, based on the analysis above, methodologies, data sources, and related observations. Explain how these considerations were taken into account in the utility's decision. Discuss changes in health, safety, and welfare of individuals in environmental justice communities from the PCA as compared to the alternatives considered, including siting considerations for any proposed new generation.

XXIV. Exhibits and Workpapers: The filing shall include exhibits and workpapers as outlined below, subject to any license or other confidentiality restrictions that are unable to be resolved by issuance of a protective order.

a) The Company shall include an exhibit containing a table that designates where each filing requirement is included within its testimony, exhibits, and workpapers, with appropriate page and section numbers;

b) The Company shall include an exhibit that depicts a stacked bar graph that includes the RTO capacity credit of all existing resources and new resources for all required scenarios, sensitivities, and any pertinent utility-proposed scenarios, color designated by resource type, in each of the planning years. The graph shall have a line representing expected demand over the length of the planning period with the inclusion of the necessary planning reserve margin;

c) The Company shall include an exhibit of stacked bar graphs that include the energy expected to be produced by all existing resources, new resources, and market purchases for each planning year and for all MIRPP required scenarios and sensitivities. Each graph

shall be color designated by resource type. Each graph shall have a line representing expected demand over the length of the planning period;

d) Include a chart that compares the total projected carbon emissions under each required scenario to the relevant sensitivities and build plans under that scenario, including quantifying the carbon emissions projected in each sensitivity as a percentage of the carbon emissions presented in the base scenario associated with that sensitivity. The utility shall identify and justify which of the carbon accounting methodologies it used for all scenarios and sensitivities. The methodology should be one identified in Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases or other Commission approved methodology;[13]

    1. Any workpapers used in developing the application, supporting testimony, and IRP. Such workpapers shall, when possible, be provided in electronic format with formulas intact;

e) Any modeling input and output files used in developing the application, supporting testimony, resource plan, and any alternative plans. Such modeling input and output files shall, when possible, be provided in electronic format with formulas intact. The utility shall also identify each modeling program used and provide information for how interested parties can obtain access to such modeling program. Modeling inputs and outputs in the model-dependent binary format should be made available to parties that obtain a license;

    1. Cost data, estimates, and co-benefit analyses that were used in the resource screening process or in any other way to determine resource selection of each resource that was considered either individually or in combination with other resources constructed as a single facility, including DERs, storage, and renewable energy resources;

f) A description, including estimated costs, of each alternative proposal received by the utility;

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[13] Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases, https://ghginstitute.org/wp-content/uploads/2019/04/EPRI-Wholesale-Power-Report-Published-2019.pdf, March 2019.

g) A discussion of any differences between its short-term fuel price forecasts and capacity price curve in the IRP filing, and the short-term fuel price forecasts and capacity price curve in its last power supply cost recovery plan proceeding;

h) Identification and justification of the forecasted price of energy, capacity, and fuels, and of peak demand and energy requirements used in the IRP. The utility shall identify its base case forecasts and a range of sensitivities for each such factor and explain how those sensitivities were identified. If the base case forecast(s) differs from recent previous forecasts submitted by the utility to the Commission in other cases, the utility shall provide an explanation for such differences;

    1. 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 shall analyze the cost of compliance on its existing generation fleet going forward, including existing projects being undertaken on the utility's generation fleet;
    2. Estimated annual emissions of $CO_2$ and greenhouse gases, particulates, $SO_2$, $NO_x$, and Hg per year and over the study period of the facilities included in their IRP;
    3. The assumed retirement dates of the facilities included in the IRP, with justification provided for the assumed retirement dates; and
    4. Other documents and data underlying the IRP and CEP analysis.

# Appendix 1: Acronym List

**BenMAP-CE:** Benefits Mapping and Analysis Program- Community Edition

**CO:** Carbon Monoxide

**COBRA:** Co-Benefits Risk Assessment

**CON**: Certificate of Necessity

**$CO_2$**: Carbon Dioxide

**DER**: Distributed Energy Resources

**DR**: Demand Response

**EGLE**: Department of Environment, Great Lakes, and Energy

**EJ**: Environmental Justice

**EJ SCREEN**: Environmental Justice Screening and Mapping Tool

**EWR**: Energy Waste Reduction

**Hg**: Mercury

**IRP**: Integrated Resource Plan

**ISO**: Independent System Operator

**kW**: Kilowatt

**kWh**: Kilowatt-hour

**LRZ**: Local Resource Zone

**MiEJScreen**: Michigan Environmental Justice Screening Tool

**MIRPP**: Michigan Integrated Resource Planning Parameters

**MPSC**: Michigan Public Service Commission or Commission

**MW**: Megawatts

**MWh**: Megawatt Hour

**$NO_x$**: Nitrogen Oxide

**NPVRR**: Net Present Value Revenue Requirement

**NWA**: Non-Wire Alternative

**O&M**: Operation and Maintenance

**Pb**: Lead

**PCA**: Proposed Course of Action

**PM**: Particulate Matter

**PPA**: Power Purchase Agreement

**REC**: Renewable Energy Credit

**RFP**: Request for Proposal

**RTO**: Regional Transmission Organization

**$SO_2$**: Sulfur Dioxide

**Staff**: Commission Staff

**USEPA**: United States Environmental Protection Agency

**VOC**: Volatile Organic Compounds

**ZRC**: Zonal Resource Credit

# Appendix 2: Example Affordability Methodology

1. Calculate the projected rate and expected annual bill impact for the residential customer class for each year of the PCA using the most recently approved cost of service study. Annual cost adjustments shall reflect a rate of inflation at the time of filing.
2. Calculate the expected average annual energy cost for residential customers by household using publicly available data such as the U.S. Energy Information Administration's Residential Energy Consumption Survey Dashboard and forecast in nominal dollars for the first five years of the PCA. Annual cost adjustments shall reflect a rate of inflation at the time of filing.
3. Create an income distribution of the utility's service territory using publicly available data, such as B19001 Household Income in the Past 12 Months census data. Incomes for the first five years of the plan will be presented in nominal dollars and shall reflect a rate of inflation at the time of filing.
4. Calculate the expected impact of the PCA on Michigan households within the utility service territory by adding the annual bill impact of the PCA in (a), to a residential household's expected average annual energy cost in (b), for the first five years of the plan.
5. Based on the results of (d), calculate the expected energy burden percentage for each income range of the income distribution in (c) for the first five years of the plan.

STRIKE AND BOLD

# Revised Integrated Resource Plan Filing Requirements

U-21570 & U-21867

Pursuant to Public Act 341 of 2016, Section 6t

August 15, 2025

# Application Instructions for Integrated Resource Plan Filings

These application instructions apply to a standard electric utility application for Michigan Public Service Commission (MPSC or Commission) approval of an Integrated Resource Plan (IRP) under the provisions of MCL 460.6t, as well as an IRP that may be filed under the provisions of MCL 460.6s.[1] The application shall be consistent with these instructions, with each item labeled as set forth below. Any additional information considered relevant by the utility may also be included in the application.

# Schedule

A utility shall coordinate with the Commission Staff (Staff) in advance of filing its application to avoid resource challenges with IRP applications being filed at the same time as IRP applications filed by other utilities. A utility may be requested to delay its IRP application to preserve a 21-day spacing between IRP applications.

Following the initial IRP applications, the utilities shall comply with all future filing deadlines directed by the Commission and shall continue to coordinate with the Staff to schedule future IRP application filing dates.

# Filing Announcement

To facilitate the scheduling and preparation of IRP proceedings, a utility~~, who intends to file an IRP~~ **shall file a filing announcement in a new docket at least 30 calendar days prior to the expected or scheduled filing date. A utility who intends to file an IRP** on a date other than its scheduled filing date, shall file a filing announcement, in a new docket, at least 30 calendar days prior to the proposed filing. The filing announcement, along with a proof of service, shall be served on all parties granted intervention in the utility's last IRP case and the utility's last electric rate case. If the IRP described in the filing announcement is not filed within 120 days after filing

[1] Variations from the standard instructions may occur as allowed by MCL 460.6t(4) for multistate utilities and those serving fewer than 1 million Michigan customers.

of the announcement, the filing announcement will be considered withdrawn. **The IRP filing announcement will also serve as the CEP filing announcement.** If a certificate of necessity (CON) is also being filed; the same filing announcement ~~would~~ **will** serve as the filing announcement required for the CON.

The filing announcement shall include:

a) Statement of intent to file an IRP;
b) Estimated date of filing;
c) Information related to any stakeholder engagement meetings that have already taken place or are scheduled to take place;
d) Information related to any CON application that would be filed with the utility's IRP; and
e) Information related to the CEP that will be filed with the utility's IRP.[2]

The Commission may, if necessary, order a delay in filing an application to establish a 21-day spacing between filings. The filing announcement shall be submitted at least 30 calendar days prior to the IRP application, thus providing the Commission sufficient time to issue an order regarding the 21-day spacing, if it so chooses.

# Pre-Filing Request for Proposals

Each electric utility whose rates are regulated by the Commission shall issue a request for proposal (RFP) to provide any new supply-side capacity resources needed to serve the utility's reasonably projected electric load, applicable planning reserve margin, and local clearing requirement for its customers in this state, as well as customers located in other states but served by the utility, during the initial three-year planning period to be considered in each IRP to be filed, as outlined in MCL 460.6t.

The utility shall comply with the following:

a) The utility shall include with the IRP application documentation demonstrating that the RFP process was completed;
b) The utility's RFP process is subject to audit by the Staff;

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[2] **Utility Clean Energy Plans should follow the guidance outlined in the Clean Energy Plan Filing Requirements.**

c) The IRP filing shall include evidence that the pre-filing RFP process was conducted in a manner consistent with the Commission's code of conduct, and applicable state, federal, and Commission rules, and any adherence with the competitive procurement guidance in Case No. U-20852;
d) The RFP shall allow for proposals of sizes smaller than the total capacity need such that a combination of projects is needed, including but not limited to distribution connected resources, to provide new supply-side capacity, pursuant to MCL 460.6t(6); and
e) The RFP shall allow for proposals to provide new supply-side capacity in the form of a Power Purchase Agreement for a period that is the lesser of the study period or the useful life of the resource type proposed.

# ~~Stakeholder~~ Engagement and Public Outreach Process

Participant engagement early in the development of the IRP is strongly encouraged to: (1) educate potential participants on utility plans; (2) utilize a transparent decision- making process for resource planning; (3) create opportunity to provide feedback to the utility on its resource plan; (4) encourage robust and informed dialogue on resource decisions; ~~and~~ (5) reduce utility regulatory risk by building understanding and support for utility resource decisions**; and (6) ensure the inclusion of diverse voices, including environmental justice communities and Tribal governments.** The utility may choose to incorporate some, or all, of the participant input in its analysis and decision-making for the IRP filing. **CEP participant engagement may be combined with the IRP participant engagement to the extent practical.**

In the 12 months prior to the IRP filing, each utility is encouraged to host update workshops with interested participants. The purpose of the pre-filing workshop(s) is to ensure that participants have an opportunity to provide input and stay informed regarding: (1) the assumptions, scenarios, and sensitivities; (2) the progress of the utility's IRP process; and (3) plans for the implementation of the proposed IRP. Documentation demonstrating the public outreach process undertaken by the utility shall be included with the IRP filing **and the utility is encouraged to share these documents with the public.** Documentation should include:

a) Workshop dates and times, including times outside of the workday;
b) Evidence that a notice of the workshops was provided to the public;

c) Meeting minutes;
d) Meeting or workshop attendance lists;
e) Participant comments on the last approved IRP and/or inputs into the proposed IRP application;
f) ~~Discussion indicating if or~~ **Description of** how the public outreach process influenced the IRP; and
g) Descriptions of community outreach efforts for ~~overburdened~~ **environmental justice** communities **and Tribal governments whose land base or service territory overlays with** ~~in~~ the Company's service territory. ~~Overburdened~~ **Environmental justice** communities should be identified using the MI EJ**Screen** ~~Screening~~ Tool ~~or other tools as noted in the Section XVIII~~.

A minimum of two ~~stakeholder~~ engagement workshops is recommended. A**n** ~~stakeholder~~ engagement workshop will ~~provide~~ **give interested persons** ~~stakeholders with~~ an opportunity to provide input regarding the utility's assumptions, inputs, and modeling methodologies employed during the development of the IRP. **The utility is encouraged to provide basic information regarding the IRP filing process and how interested persons could participate.** The utility is encouraged to invite **interested persons** ~~stakeholders~~, including **Tribal governments,** expected intervenors, and the Staff, to its ~~stakeholder~~ engagement workshops.

If the ~~stakeholder~~ engagement workshops are not open to the public, two additional hybrid public meetings with the option for both virtual and in-person attendance are recommended. **If 5% or greater of a utility's residential customers are in communities identified as part of the Environmental Justice (EJ) analysis, it is recommended that at least one of the two additional hybrid public meetings are located in any of the identified communities.** The public meetings are intended to educate the public on the utility's planning process as well as provide an opportunity for the public to comment. **The utility is encouraged to provide basic information regarding the IRP filing process and how interested persons and members of the public could participate.** The public meetings should be offered in the utility's service territory in geographic locations **that are** convenient ~~to~~ for customers, **prioritizing accessibility and convenience for customers** ~~in environmental justice communities~~ **identified in the EJ analysis.** ~~with~~ Advanced notice **should be** provided to customers in the utility's service territory. This should include **Tribal governments, local governments, and** community-based

organizations. The utility is encouraged to consider holding public meetings after normal business hours to encourage attendance.

The public meetings should be conducted in a manner accessible to those with disabilities, including those that are hearing and visually impaired. The public meetings should also be available to those whose first language is not English upon request and to the extent practicable.

If the utility chooses to hold pre-filing workshops, including ~~stakeholder~~ **engagement** workshops or public meetings, the utility shall prepare a public outreach report to document the outcomes of any pre-filing workshops, and shall file the report with the IRP application.

All presentations, recordings, comments, and transcripts from those presentations open to the public should be maintained on a website in a location open to the public for the duration of the ~~stakeholder~~ outreach process and the duration of the IRP case, until a final commission order is published.

# Risk Assessment Methodology

The utility's IRP filing shall include a thorough risk assessment of the proposed resource plan and the optimal plans for each of the scenarios specified in the Michigan Integrated Resource Planning Parameters (MIRPP), all additional utility-developed scenarios and utility-developed sensitivities related to early retirement that are filed with the IRP application. The utility-submitted alternative build plans should be feasible and differ in generation mix from the proposed resource plan and MIRPP plans.

The intent of the risk assessment is to test the optimized resource strategies for each scenario and the proposed course of action (PCA) to determine how each strategy would perform in an unexpected range of possible futures. The utility shall provide detail on how the risk assessment was conducted, including the impact of atypical weather conditions that occur at least as frequently as once in ten years.[3,4,5] **The utility shall also include all extreme weather events of**

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[3] Summary Climate Information, https://glisa.umich.edu/summary-climate-information/
[4] Tools for Tracking Climate Change, https://ccr.nelson.wisc.edu/
[5] **Atypical weather conditions are weather events that meet the definition of "catastrophic conditions" from the MPSC Service Quality and Reliability Standards less the periods with a State declaration of emergency**

**the last 20 years, identified by State declaration of an emergency. Additionally, the utility should detail any scenario and sensitivity runs conducted with the utility's risk assessment where the PCA or proposed alternative build plan results in unserved load.** Utilities are encouraged to link variables that can be shown to have correlation or dependencies with each other. **Examples of variables to be considered under weather conditions include but are not limited to changes in load, operations, and resource availability.**

The IRP shall include a discussion of the methodology used for risk assessment, including the utility's justification for the chosen methodology over other alternatives. Acceptable forms of risk assessment include, but are not limited to, the following: scenario analysis, global sensitivity analysis, stochastic optimization, generating near-optimal solutions, agent- based stochastic optimization, mean-variance portfolio analysis, and Monte Carlo simulation.

Utilities with one million customers or more, shall include a Local Reliability Requirement (LRR) analysis of the proposed resource plan in the IRP filing. The LRR analysis shall **estimate** ~~provide~~ a five-year outlook of the LRR in the local resource zone. The analysis shall be conducted consistent with the resource adequacy construct used by the regional transmission organization (RTO) or independent system operator (ISO). The purpose of this calculation is to estimate the marginal impact of the utility's proposed resource plan on the resource adequacy of the local resource zone during the first five years of the plan.

# Confidential Information

Transparency and the use of data that can be shared with the Commission, the Staff, and intervenors is encouraged. Proprietary, confidential, and other nonpublic materials used in the development of the forecasts, scenarios, or other aspects of the IRP shall be presented in such a way that the proprietary and confidential nature of the materials is preserved. The use of publicly available data and materials is encouraged in lieu of proprietary and confidential materials and claims that information is proprietary or confidential should be justified by the utility.

Inclusion of specific materials in the IRP filing may be contingent upon appropriate confidentiality agreements and protective orders. Proprietary, confidential, and other nonpublic materials filed as part of the IRP shall be clearly designated by the utility as confidential.

# Definitions

The following definitions are provided to aid in ensuring consistency across planning processes.

Distributed Energy Resources - A source of electric power and its associated facilities that is connected to a distribution system. Distributed Energy Resources (DER) includes both generators and energy storage technologies capable of exporting active power to a distribution system.

Non-Wires Alternatives - An electric grid investment or project that uses distribution solutions such as DER, energy waste reduction (EWR), demand response (DR), and grid software and controls, to defer or replace the need for distribution system upgrades.

~~Overburdened~~ **Environmental Justice** Communities – Refers to overburdened, vulnerable, underserved, or disadvantaged communities that are identified**, for the purpose of this analysis, by a minimum percentile of 75 in the Michigan Environmental Justice Screening Tool (MiEJScreen)** ~~**or a minimum percentile of 75 in either the Low Income Population or Black, Indigenous, People of Color population layer.** in accordance with metrics and percentiles as recommended by the specific environmental justice screening tool used.~~ **If MiEJScreen tool is not available, the utility should work with and take feedback from Staff, EGLE, and interested parties when determining which other tool or methodology to use.**

**Environmental Justice Analysis – Refers to the identification of and assessment of impacts to Environmental Justice Communities, as well as the identification of communities with a minimum percentile of 75 in either the Low Income Population or Black, Indigenous, People of Color population layers in the MIEJScreen tool.**

Demand-Side Resources - Resources serving resource adequacy needs by reducing or shifting load, which reduces the need for additional generation, including but not limited to EWR, DR, grid and software controls, behind-the-meter distribution connected storage, etc.

Co-Benefits – Benefits that are quantified as part of another planning process that are important for the justification of a resource included in the IRP. Examples include ~~benefits to distribution planning or transmission planning.~~ **a cost reduction to the distribution system or transmission system that has been evaluated in the distribution planning or transmission planning process.**

# Approval of Costs

For the Commission to specify the costs to be approved for the construction of or significant investment in supply or demand-side resources, or contractual agreements, excluding short-term market capacity purchases to meet state reliability mechanism capacity requirements, in accordance with MCL 460.6t(11) through (12), the following information, data, and documents shall be provided:

For specific supply-side resources (inclusive of storage technologies), that are planned to commence within three years following the approval of the IRP, the following evidence (covering the lifespan of the project) shall be provided:

a) A description of the plant size, type, and summary of engineering/design specifications. The description shall also include the following:
    1. Description of fuel use, both primary and back-up, and provisions for transporting and storing fuel;
    2. Projected annual costs, in accordance with the breakdown specified in the Federal Energy Regulatory Commission Uniform System of Accounts; and
    3. Annual depreciation on the capital investment.
b) Projected annual return and income taxes on capital investment;
c) The operation and maintenance (O&M) costs over the life of the facility described as costs which are variable, in current dollars per kilowatt-hour (kWh), with expenses for fuel and non-fuel items indicated separately; and costs which are fixed, in current dollars per kilowatt (kW);
d) Projected property taxes;
e) The rates of escalation of cost, including:
    1. Capital costs;

2. O&M costs which are variable and related to fuel;
3. O&M costs which are variable and unrelated to fuel; and
4. O&M costs which are fixed.

f) The total annual average cost per kWh at projected loads in current dollars for each year of the plan for the proposed facility;
g) Equivalent availability factors, including both scheduled and forced outage rates;
h) Capacity factors for each year in the planning period;
i) Operation cycle (i.e., baseload, intermediate, or peaking), identifying expected hours per year of operation, number of starts per year, and cycling conditions for each year in the planning period;
j) Heat rates (efficiency) for various levels of operation;
k) Unit lifetime, both for accounting book purposes and engineering design purposes, with explanations of differences;
l) Lead time, separately identifying the estimated time required for engineering, permitting and licensing, design, construction and pre-commercial operation date testing;
m) Potential socioeconomic impacts, such as employment, for the local region of the proposed supply-side resource, construction of or significant investment in an electric generation facility, or the purchase of an existing electric generation facility;
n) Procurement strategy, including **third-party** ~~power purchase agreements (PPAs)~~ and company owned contracts, and any adherence to the most recent Commission approved Competitive Procurement Guidance; and
o) A summary description of the expected decommissioning process, costs, and how the utility intends to provide assurance of proper disposal with consideration of material salvage and recycling for proposed new resources.

Renewable Resources: The utility shall file data consistent with any approved renewable ~~procurement~~ **energy** plan. Revenue requirement and incremental costs shall be calculated to include the following:

a) Capital, O&M costs for renewable energy systems (including property taxes and insurance for renewable energy systems);
b) Financing costs;

c) Costs that are not otherwise recoverable in base rates, including interconnection and substation costs;
d) Cost of purchased renewable energy credits (RECs) other than those purchased for non-compliance;
e) Cost of Contracts;
f) Expenses incurred as a result of governmental action including changes in tax or other laws;
g) Subtract revenues (i.e., transfer price, environmental attributes, interest on regulatory liability, etc.) through 2029;
h) Recovery to include the authorized rate of return on equity, which will remain fixed at the rate of return and debt to equity ratio that was in effect in base rates when the renewable plan was approved (only through 2029);
i) Provide the following information in relation to renewable resource cost recovery:
   ~~1. Forecast through the end of the renewable plan period of the non-volumetric surcharge; and~~
   ~~2. Forecast through the end of the renewable plan period of the regulatory liability balance.~~
j) Procurement strategy, including third-party and company owned contracts. Address whether the procurement strategy adhered to the most recent Commission-approved Competitive Procurement Guidance; and
k) A summary description of the expected decommissioning process, costs, and how the utility intends to provide assurance of proper disposal with consideration of material salvage and recycling for proposed new renewable resources.

**Energy Storage: The utility shall provide any relevant data, according to its plan to procure its share of the statewide energy storage target, established under MCL 460.1101(1). The following information shall be provided in relation to the energy storage procurement plan:**

a) If the utility has not yet filed for approval to procure its proportional share of the statewide energy storage target, the utility must seek approval of these storage resources in an IRP filed no later than December 31, 2029;
b) Capital and O&M costs for energy storage systems;

c) Financing costs;
d) Procurement strategy, including third-party contracts, build transfer, or company owned. Address how the utility will adhere to the most recent Commission approved Competitive Procurement Guidance;
e) A summary description of the expected decommissioning process, anticipated costs, and how the utility intends to provide safety and assurance of proper disposal, with consideration of material salvage and recycling, for proposed new energy storage resources.

EWR: The utility shall provide the following information in relation to EWR programs cost approval and recovery (**including utility providers that elect the State Administrator under the alternative compliance program, also known as the Efficiency United or EU program)**. For each individual program or group of programs, provide:

a) Total annual cost**, energy, and capacity** including:
    1. Annual O&M cost for each individual portfolio of EWR programs;
    2. Annual capital cost for each individual portfolio of EWR;
    3. Expected cost-sharing or financial incentive granted to the utility by the Commission; and
    4. How the utility included the avoided distribution costs when evaluating the most cost effective EWR amount in all IRP scenarios.
    5. Total demand (MW) and energy (megawatt hours (MWh) reduction potential.
b) Calculated generation savings using annual marginal line loss rates for energy and marginal line loss rates at peak hours for capacity to determine total peak demand (MW) and energy (megawatt-hours (MWh)) reduction potential;
c) Total resource capacity (MW) and whether or not it is reported/registered to the applicable regional transmission organization (RTO) or independent system operator (ISO). **If the resource is registered to an applicable RTO/ISO, then detail the resource type it is registered as.**

DR, DER Programs, and other demand-side resources: The utility shall provide the following information in relation to DR programs, DER programs, and other demand-side resources cost approval and recovery. For each individual program or group of programs, provide:

a) Total annual cost including:

1. Annual O&M cost for each individual program of DR, DER, and demand-side programs;
2. Annual capital cost for each individual program of DR, DER, and demand-side programs; and
3. ~~Expected cost-sharing or financial incentive granted to the utility by the Commission.~~

b) Total demand reduction potential (MW), including the amount of load reduction and the expected hours of interruption per day, month, and year for each program, if applicable;
   1. Maximum single event demand reduction;
   **2.** Total resource capacity (MW) **and whether or not it is** ~~type (load modifying resource, emergency DR, etc.)~~ reported/**registered** to **an** ~~the~~ applicable RTO or ISO, **then detail the resource type it is registered as;**
c) Total energy reduction achieved (MWh); and
d) Description of program, including customer enrollment, technology used, and marketing plan.

# Waivers and Process for Smaller and Multistate Utilities

An electric utility with fewer than 1,000,000 customers in this state may request a waiver to any portion of these IRP filing requirements. Any request for a waiver shall include a discussion and justification outlining why the waiver is warranted and in the best interest of its customers. Discussion and justification for the requested waiver shall include a description of the utility's current and forecasted energy and capacity needs, and its plan for meeting those needs over the upcoming 10 years.

If the utility requires resolution of a waiver request prior to filing an IRP application, the utility shall file the waiver request no less than 60 days prior to the filing of the IRP application. An electric utility with fewer than 1,000,000 customers in this state may request approval from the Commission to file an IRP jointly with other smaller utilities. Commission approval is required prior to filing a joint IRP.

A non-multistate Michigan electric utility serving fewer than 1,000,000 customers may elect to

file an IRP, based on its specific circumstances, that deviates from these requirements, but that is subject to the Staff's ability to request supplemental information. The filing shall include an explanation of why the deviations are reasonable under its circumstances. The Commission shall review any such filings under the traditional "just and reasonable" standard.

Northern States Power Company-Wisconsin and Indiana Michigan Power Company are utilities located in Michigan that already file multistate IRPs in other jurisdictions. Due to the provisions in MCL 460.6t(4) regarding multistate IRPs, Northern States Power Company-Wisconsin and Indiana Michigan Power Company may utilize the IRP filing requirements of another state in accordance with those provisions. However, the Commission reserves the right to request additional information to facilitate its review of the IRP as it relates to Michigan.

# IRP Filing, Data, and Documentation

The utility's IRP filing shall demonstrate compliance with MCL 460.6t and include the following items:

a) Letter of transmittal expressing commitment to the approved resource plan and resource acquisition strategy and signed by an officer of the utility having the authority to commit the utility to the resource acquisition strategy, acknowledging that the utility reserves the right to make changes to its resource acquisition strategies as appropriate due to changing circumstances;
b) Technical volume(s) that fully describe and document the utility's analysis and decisions in selecting its proposed resource plan and resource acquisition strategy;
c) The data and information requested in the Commission's IRP Filing Requirements included herein;
d) Any information that the Commission in its orders regarding the utility's previous IRPs or other dockets required to be provided in this present IRP. This information should also be provided to interested persons at public outreach meetings; and
e) Any other information deemed relevant by the utility.

The utility's IRP filing shall include an IRP document(s) and application information, including testimony and exhibits, that fully describes and documents the utility's analysis and decisions in selecting its proposed resource plan and resource acquisition strategy. To facilitate a similar

format for each utility's application, the utility is encouraged to align its filing with this provided outline and include at least the following items:

I. Executive Summary: An IRP shall include an exhibit that serves as an executive summary, suitable for distribution to the public. The executive summary shall be an informative non-technical description of the resource plan proposed by the utility and resource acquisition strategy. The executive summary shall summarize the contents of the IRP document and shall include the following:

~~a) A description of how the environmental justice analysis results influenced the utility's proposed course of action (PCA);~~

a) An overview of the planning period examined in the IRP analysis and application;
b) A brief introduction describing the utility, its existing facilities, new resources being proposed, and implementation strategy;
c) A summary of the state, federal, ISO, RTO resource adequacy regulations applicable to the utility;
d) A summary of the analytical approach used in the utility's analysis and the types of new resources considered;
e) A description of how the analytical approach considered potential resource co-benefits from other planning processes, such as distribution or transmission planning;
f) A summary of any retirement analysis performed;
g) A description of how the environmental justice (EJ) analysis results influenced the utility's proposed course of action (PCA);
h) The Company shall include a graph that depicts a stacked bar graph that includes the RTO/ISO capacity credit[6] of all existing resources and PCA resource additions, color designated by resource type, that it will use to serve demand in each year for all planning years. The graph shall have a line representing expected demand over the length of the planning period with the inclusion of the necessary planning reserve margin;
i) The Company shall include a graph that depicts a stacked bar graph that includes the annual energy expected to be produced by all existing resources, PCA resource additions,

[6] For example, MISO Zonal Resource Credit.

and market purchases for each year of the planning horizon. The graph shall be color designated by resource type. The graph shall have a line representing expected demand over the length of the planning period;

j) The Company shall include a graph**(s)** that summarizes the total of each of the following pollutants projected using the PCA in the MIRPP Scenario 1 for each year of the planning horizon. A graph should be included for nitrogen oxide ($NO_x$), sulfur dioxide ($SO_2$), particulate matter (PM), mercury (Hg), volatile organic compounds (VOC), carbon dioxide ($CO_2$). The graph should also depict the utility's progress toward or achievement of State, Federal and utility announced goals or requirements by including annotations for those goals on the years they apply;

k) The Company shall include a discussion of the estimated costs of the PCA; and

l) Any other information that would aid the public understanding of the utility's proposed resource plan.

II. Table of Filing Requirements:

The utility shall provide a table that clearly identifies where in the filing it has met all the filing requirements. It shall include locations in testimony, exhibits, and workpapers.

III. Testimony Introduction: The utility shall describe resource plans to satisfy at least the objectives and priorities identified in MCL 460.6t. The utility may identify and/or describe additional planning objectives that the resource plan will be designed to meet. The utility shall describe and document its additional planning objectives and its guiding principles to design alternative resource plans that consider the planning objectives and priorities. The introduction shall include the following:

a) General description of the utility's existing energy system, including:
    1. Net present value revenue requirements (NPVRR),[7] with and without any financial performance incentives for demand-side resources;
    2. Summary of existing generation and PPAs by fuel type;
    3. Utility's existing capacity resource mix;

[7] The assumed discount rate shall be included along with a justification for the assumed discount rate. Results should be presented in nominal dollars.

4. Utility's service territory and breakdown of customer class composition; and
5. Description of planning period analyzed;

b) Statement of power need;

c) Identify and explain the basis for the forecasted price of energy, capacity, fuels, and of peak demand and energy requirements~~, for each year of the analysis~~ **over the study period** used in each scenario and sensitivity evaluated by the utility as part of the IRP process;

d) Market and regulatory environment influencing resource planning decisions:
   1. RTO market and state regulation structure if a multistate utility;
   2. Potential changes to RTO capacity market;
   3. Electric customer choice;
   4. Transmission expansion;
   5. Environmental;
   6. Renewable portfolio standards; and
   7. Other;

e) IRP planning process; and

f) ~~Stakeholder~~ **Engagement** report.

IV. Analytical Approach:

a) Describe the modeling process, including the duration of the study;

b) The utility shall describe and identify how its model approach optimizes resources to meet load and demand for all times of the year and for each year of the planning horizons. The utility shall explain how the model considers the seasonal and operational characteristics of all resource types, including generation profiles, forced outages, facility derates, seasonal or limited availability of resources, etc.;

c) The PCA and Utility Alternative (if applicable) should be evaluated under all scenarios and sensitivities listed in the MIRPP;

d) If the utility presents a retirement study as justification for an early resource retirement or to delay the scheduled retirement of a fossil fuel plant, the utility should refer to the minimum scenario and sensitivities in Appendix G of the MIRPP when conducting that analysis. The previously approved retirement dates should also be evaluated under the scenarios and sensitivities indicated in Appendix G. To allow for evaluation over the

same time horizons, the portion of the previously approved IRP that does not have resources, should include any new (additional) generic resources as selected by model optimization.

e) If the utility is proposing the retirement of a baseload or intermediate coal or natural gas power plant with a date that differs from the most recently approved IRP:
    1. The utility shall share the dates being studied, as well as the criteria that will be analyzed as part of the IRP, with Staff. This information will be provided in the utility's initial IRP filing.
    2. To test the optimized resource strategies for the proposed retirement, the utility shall model sensitivities to ensure the retirement dates were stress-tested and the PCA is reasonable and prudent under various conditions.
    3. Sensitivities may include, but are not limited to, high load growth, high natural gas prices, and extreme weather conditions.
    4. The utility must present the retirement analysis methodology, summarize the results, and demonstrate that the PCA is reasonable and prudent under the conditions tested. The utility must also demonstrate that the PCA complies with the renewable energy plan requirements of MCL 460.1028, the clean energy requirements of MCL 460.1051, the energy waste reduction measure in MCL 460.1077, and the energy storage target of MCL 460.1101, unless the retirement analysis is part of a request for extension of compliance with the clean energy plan under MCL 460.1051(b).
    5. If the retirement proposed as part of the PCA is not supported under one or more of the conditions or sensitivities assessed, the utility shall include in testimony how the company plans to monitor the risk in advance of retirement as well as a risk mitigation plan.

f) Describe and provide a justification for the risk assessment approach adopted from the Risk Assessment Methodology section:
    a) The utility shall describe and document its quantification of the risk that affects the evaluation of the various resource plan options;
    b) The utility shall provide a tabulation of the key quantitative results of that assessment and a discussion of how those findings affected its decision on a resource plan; and

c) If multiple forms of risk assessment are presented the utility shall explain why certain risk variables could not be included in or are unsuited for one type of risk assessment or another. Considering a risk variable under multiple forms of risk assessment is not discouraged.

d) The utility shall describe and document the identification of risk variables and/or combinations of risk variables selected, their ranges, probabilities, ranking, and/or weighting that defines the risk quantification which the various resource plan options were judged; describe how these risk variables were judged to be appropriate and explain how these were determined; and describe the modeling tools and data sources employed during the capacity expansion, and other modeling processes; and

e) Interactions between risk variables should be captured to the extent that it is practical. Evaluation of variables in isolation is acceptable so long as there exists a comprehensive evaluation of resource plans risks that captures interactions and shows overall risk of appropriate build plans. A comprehensive risk assessment should at least include optimized build plans from the required MIRPP scenarios, the proposed resource plan, and any alternative resource plans presented by the utility.

V. Integrated Resource Plan Scenarios and Sensitivities:

a) Include a detailed description of all scenarios and sensitivities; and

b) In addition to the utility's own scenarios and assumptions, the inclusion of the established modeling scenarios and assumptions in the MIRPP, approved by the Commission in Case No. U-~~21219~~**XXXXX**, or as revised by subsequent Commission orders related to IRP modeling parameters and requirements.

c) The utility should show how it used the MIRPP-approved Scenarios, or any additional scenarios that the utility decides to include, to develop the PCA and any alternative build plan and to justify any retirement decisions. To the extent that some portion of the MIRPP-approved scenarios is of concern for the utility, the utility can request a waiver, in advance of the filing of the IRP, to deviate from certain aspects of a scenario or sensitivity. Examples may be to request to use a different gas price or updated EWR information.

**d) Consistent with MCL 460.1051(b), if a utility has requested and been approved for an off-ramp for their REP, the IRP should align and reflect the Commission's**

**approval. If the utility is using the results of its IRP to support a request for an off-ramp, the utility should run Scenario#1 and Scenario#2 with an additional sensitivity (sensitivities) that illustrates the resulting difference in cost and overall build plan as compared to meeting the standard without the use of an off ramp.**

e) The utility should model its PCA, any utility proposed alternative, any additional scenarios the utility decides to include, and previously approved IRP build plan in all scenarios and sensitivities presented in the MIRPP.

VI. Existing Supply-Side Resources: Detailed account of projected energy and capacity purchased or produced by the utility's owned and contracted resources, including cogeneration resources. Include data regarding the utility's current generation portfolio, including the age, capacity factor, licensing status, and remaining estimated time of operation for each facility in the portfolio:

a) Overview;
b) Fossil-fueled generating units;
c) Nuclear generating units;
d) Hydroelectric generating units;
e) Renewable generating units;
f) Energy storage facilities;
g) ~~PPAs~~**Third-party contracts**: energy and capacity purchased or produced by the utility from a contracted resource, including any cogeneration resource; and
h) RTO/ISO capacity credits and modeling of existing units (such as capacity factor, heat rate, outage rate, in-service and retirement dates, operating costs, etc.).

VII. Demand-Side Resources: Historical and projected load management and DR programs for the utility in terms of MW and RTO or ISO Zonal Resource Credits (ZRCs) and the projected costs for those programs.

a) Provide data on projected enrolled capacity and DR events for each program. The following items are to be included:
    1. Description of current DR and load management programs for the IRP study horizon, including the amount of load reductions and the expected hours of interruption per day, month, and year for each program;

2. Review the historic performance of existing demand-side programs in delivering benefits and how the utility used such information in its DR resource decisions;
3. Describe the utility's method for **identifying and deciding whether to pursue cost-effective and achievable DR, and** determining whether to purchase energy rather than relying on DR; and
4. A description of any other programs the utility is considering that could potentially expand DR resources, including expected load reductions and operating parameters.

VIII. Renewables and Renewable Portfolio Standards **Requirements** ~~Goals~~: Projected energy purchased or produced by the utility from renewable energy resources.

a) Describe how the electric provider will meet existing renewable energy standards. If the level of renewable energy purchased or produced is projected to drop over the planning periods, the utility must demonstrate why the reduction is in the best interest of ratepayers;
b) Specify whether the number of MWh of electricity used in the calculation of the REC portfolio will be the previous 12-month period of weather-normalized retail sales or based on the average number of MWh of electricity sold by the electric provider annually during the previous three years to retail customers in this state;
c) Include the expected incremental cost of compliance with existing renewable energy standards for the required compliance period;
d) A description of how the electric provider's plan is consistent with the renewable energy ~~goals~~ **requirements established** by the Michigan Legislature (e.g. **50% renewable energy by 2030 and 60 % by 2035**~~35% combined renewable energy and EWR goal by 2025~~);
e) Describe the options for customer-initiated renewable energy that will be offered by the electric provider and forecast sales of customer- initiated renewable energy;
f) Describe how the electric provider will meet the demand for customer- initiated renewable energy, and;
g) Describe how the electric provider has included distributed generation as a resource within its modeling **for both the IRP and CEP**, including interconnection to utility distribution as well as behind-the-meter.

IX. **Energy Storage Target: Description of how the utility will meet its proportional share of**

**the statewide energy storage target required by MCL 460.1101(1).**

a) If the utility has not yet filed for approval to procure its proportional share of the statewide energy storage target, the utility must seek approval of these storage resource in an IRP filed no later than December 31, 2029;
b) Identification of the utilities proportional share of the statewide energy storage target of 2500 MW, to be calculated using the methodology approved by the Commission in Case No. U-21751;
c) Describe the Company's storage procurement plan to meet its required share of the statewide target, including providing the following data on an annual basis:
    1. Nameplate capacity and energy output of new resource additions;
    2. Storage technology/chemistry deployed and in what amounts;
    3. Mix of energy storage capacity that is long-duration and multi-day in duration;
    4. Project costs;
    5. If the utility's energy storage plan differs from the resultant capacity expansion results, the utility should present its analysis on how it determined the optimal mix and timing of different energy storage technologies and duration capabilities to meet its share of the statewide target, including any modeling or description of other analytical approaches taken.

X. ~~The following non-exhaustive list suggests several elements that may be included~~**Clean and Renewable Energy Standard Section**:

a) Sales forecast from the first year of the study period through 2025 toward meeting the 35% goal, and through the study period.
b) Detailed resource plan that clearly illustrates how the utility has aligned its IRP with its CEP and how the utility will meet the Clean Energy Standards of 80% clean energy by 2035 and 100% clean energy by 2040. The utility must:
    1. Describe the utility's planned REC portfolio;
    2. Forecast RECs obtained via Michigan incentive RECs;
    3. Forecast expected compliance levels by year to meet the renewable portfolio targets;

4. Identify key assumptions used in developing these forecasts and the proposed resource portfolio; and
5. Identify risks which may drive performance to vary.

c) If the utility is requesting an extension of a renewable energy credit portfolio deadline pursuant to MCL 460.1032, the utility must:
    1. Provide justification for the extension.
    2. Model at least one portfolio without an extension (i.e. what it would look like given the renewable energy deadline without the extension).

XI. Peak Demand and Energy Forecasts: A long-term forecast of the utility's sales and peak demand under various reasonable scenarios. Include details regarding the utility's plan to eliminate energy waste, including the total amount of EWR expected to be achieved annually, and the cost of the plan:

a) A forecast of the utility's peak demand and details regarding the amount of peak demand reduction the utility expects to achieve.
b) Subsections:
    1. Key variables used to develop forecast;
    2. Long-term forecasting methodology;
    3. Forecasting uncertainty and risks;
    4. Historical growth in electric sales for the previous five years, including a record of its previous load forecasts (can be supplied in workpapers);
    5. Base Case deliveries **sales including assumed losses** and demand forecast;
    6. Alternative forecast scenarios and sensitivities in accordance with the Commission's final order in Case No. U-21219, or subsequent Commission orders relating to IRP modeling parameters and requirements;
    7. Describe in detail about how the forecasts used for IRP modeling align with forecasts used for distribution planning;
    8. Detail information about how the Company considered DER and non-wired alternative solutions for the potential to offset future utility-scale resourcesDER adoption;
    9. Detail electric vehicle adoption assumptions and impacts to overall peak demand and energy forecasts;

10. Detail additional electrification adoption assumptions and impacts to overall peak demand and energy forecasts; and
11. Detail exactly how much EWR is embedded in the utility's load forecasts.

XII. Capacity and Reliability Requirements: The utility shall indicate how it complies, and will comply, with all applicable state, federal, ISO, and RTO capacity and reliability regulations, laws, rules, and requirements, (such as planning reserve margins, system reliability and ancillary service requirements) including**, where feasible,** the projected costs/revenues of complying with those regulations, laws, and rules. The utility shall identify any relevant changes to the applicable state, federal, or local laws, rules, and regulations. The utility shall also identify any major ISO or RTO capacity and reliability requirements that have occurred since its last IRP filing, including narrative that identifies how its PCA satisfies those requirements. The utility shall include data regarding the utility's current generation portfolio, including the age, capacity factor, licensing status, and remaining estimated time of operation for each facility in the portfolio.

XIII. Transmission Analysis: In accordance with MCL 460.6t(5)(h), the utility shall work with their local transmission owner to include an analysis of potential new or upgraded electric transmission options for the utility. The utility's analysis shall include the following information:

a) The utility shall work with their local transmission owner to assess the need to construct new, or modify existing transmission facilities to interconnect any new generation and shall reflect the estimated costs of those transmission facilities in the analyses of the resource options;
b) In collaboration with the incumbent transmission owner, include an analysis of any co-benefits of storage, specifically the transmission system benefits associated with transmission interconnected storage that is not designated as "storage as transmission only asset;"
c) A detailed description of the utility's efforts to engage local transmission owners throughout the utility's IRP process. In an effort to inform the IRP process and assumptions, a meeting schedule in coordination with the transmission owner should be determined that supports engagement through the process. The filing should include a summary including meeting dates, number of meetings and how the engagement influenced the utility's decisions;

d) Detailed meeting minutes for utility/transmission owner meetings should include any requested studies, discussions about assumptions and any conclusions made during the meeting, alternatives that were reviewed, any other pertinent information that can be made public or provided through typical contested case confidentiality agreements;
e) Current transmission system import and export limits as most recently documented by the RTO and any local area constraints or congestion concerns;
f) To the extent available, any information provided by their local transmission and RTO owner indicating the anticipated effects of fleet changes proposed in the transmission system, including both generation retirements and new generation, subject to confidentiality provisions; Any information provided by their local transmission owner, including cost and timing, indicating potential transmission options that could impact the utility's IRP by: (1) increasing a local resource zone's (LRZ) import or export capability; (2) facilitating PPAs or sales of energy and capacity both within or outside the planning zone or from neighboring RTOs; (3) transmission upgrades resulting in increasing system efficiency and reducing line loss allowing for greater energy delivery and reduced capacity need; and (4) advanced transmission and distribution network technologies affecting supply-side resources or demand-side resources; (5) estimated interconnection costs for new resources (6) potential siting locations that may provide transmission system benefits;
g) In collaboration with their local transmission owner, to the extent available**,** any information regarding (1) identification of system locations or regions where energy resources can interconnect to the transmission system with minimal transmission investment, (2) recent studies, to the extent that they are available, that indicate ways in which the capacity import or export capabilities can be increased or may change and the resulting impacts to the local clearing requirement;
h) Any transmission studies performed by their local transmission owner that support the resource plan proposed by the utility;
i) In conjunction with the local transmission owner, provide an analysis of transmission costs for access to out of state resources conducted by either the RTO, transmission owner(s), and/or utility; and

j) Provide RTO reports or web links to report locations that contain information relied upon to support transmission related model assumptions.

XIV. Fuel: The utility shall include the following:

a) Overview;
b) Natural gas price forecasts under the various scenarios;
c) Oil price forecasts under the various scenarios;
d) Coal price forecasts under the various scenarios;
e) Delivered natural gas prices to existing and new utility-owned generating plants;
f) Delivered oil prices to existing and new utility-owned generating plants;
g) Delivered coal prices to existing and new utility-owned generating plants;
h) Projected annual fuel costs under the various scenarios;
i) The projected long-term firm gas transportation contracts or natural gas storage the utility will hold to provide an adequate supply of natural gas to any new and existing generation facility; and
j) Any other fuels used for electric generation by the utility.
k) New generation or retrofitted generation costs to connect to fuel and store CO2 where applicable.

XV. Resource Screen: Describe the utility's options of resources, including combinations of resources constructed as a single facility (such as storage combined with a generation source), to serve future electric load such as utilizing existing and planned resources **(including future load from the electric provider's voluntary green pricing program and any special contracts)**, build a new facility, purchasing capacity from the market on a short-term basis, and purchasing capacity through a PPA. The following sections shall discuss each option in detail and options shall be considered in combination to serve future electric load. As described below, workpapers with information on the costs and performance data of each modeled resource option and combination of resource options shall be provided with the utility's filing:

a) Existing and approved resources;
b) New build:
    1. New generation technology and operating assumptions;
    2. New generation development costs;
    3. New storage technology and operating assumptions;

4. New energy storage development costs; and
5. Development costs and operating assumptions for combinations of resources constructed as a single facility;

c) DERs inclusive of non-wires alternatives (NWA) identified in other planning processes;
d) Demand-side Resources inclusive of NWAs identified in other planning processes;
e) Market capacity purchases:
    1. Regional market supply outlook;
    2. Availability of market capacity; and
    3. Market capacity price assumptions;
f) Long-term PPAs; and
g) Transmission resources:
    1. Overview;
    2. Existing import and export capability;
    3. Transmission network upgrade assumptions for the IRP; and
    4. Import and export impact on resource strategy.

XVI. Modeling Results: An analysis of the capital costs, energy production, energy production costs, fuel costs, energy served, capacity factor, emissions (levels and costs), and viability of all reasonable options available to meet projected energy and capacity needs, including, but not limited to, existing electric generation facilities in this state. The following suggest specific items to be included. They are not exhaustive.

a. Description of IRP portfolio design strategy (portfolio optimized for least cost, value maximization, reliability, risk minimization, environmental specification, **minimization of impacts to communities identified in the EJ analysis,** etc., or a particular combination);
b. Results for all MIRPP required scenarios and sensitivities, additional utility scenarios and sensitivities, and the proposed resource plan that include annual incremental revenue requirements, incremental present value of annual revenue requirements and net present value of revenue requirements, and portfolio capacity, including additions and retirements. Include monthly and annual energy pricing, and resource capacity and load factors;
    1. Base case portfolio options to be selected from;

2. Analysis of IRP results;

c. Risk assessment is presented with graphics and data that illustrate the results of any stochastic risk analysis performed such that the probability distributions are clearly defined along with relative positions of the distributions so that plans can be directly compared on a single graph. The use of a box and whisker plot and/or efficient frontier plot is recommended; and

d. Impacts on resource adequacy for the resource zone.

XVII. Proposed Resource Plan: Include a detailed description of:

a) The type of generation technology proposed for a generation facility or combination of resources constructed as a single facility contained in the plan and the proposed capacity of the generation facility or combination of resources constructed as a single facility, including projected fuel costs under various reasonable scenarios;

b) Plans for meeting current and future capacity needs with the cost estimates for all proposed construction and major investments, including any transmission or distribution infrastructure that would be required to support the proposed construction or investment, and PPAs;

c) The projected long-term firm gas transportation contracts or natural gas storage the utility will hold to provide an adequate supply of natural gas to any new generation facility; and

d) How the utility will meet local, state, and federal laws, rules, and regulations under the PCA;

e) The impact of the proposed course of action on the diversity of the Company's resource portfolio. Include details in a qualitative discussion;

f) How the utility's IRP and CEP align with or differ from the Company's most recently filed Renewable Energy Plan (REP). If the IRP and CEP diverge from the REP, describe how they will meet the Renewable Energy Portfolio Standard set out in PA 235 and how these differences will influence future REP filings;

g) How the utility's IRP storage builds meet the utility's share of the Energy Storage Target as set out in PA 235; and

h) How the utility's IRP aligns with or differs from the utility's most recent EWR plan and how the EWR in the PCA complies with PA 295 as amended.

XVIII. The utility shall describe the process used to select the proposed resource plan, including

the planning principles used by the utility to judge the appropriate tradeoffs between competing planning objectives and between expected performance and risk. The utility shall describe how its proposed resource plan satisfies the following:

a) Strike an appropriate balance between the various planning objectives specified;
b) Utilize renewable and demand-side resources to comply with existing laws, goals and, in the judgment of the utility, are consistent with the public interest to achieve state energy policies;
c) In the judgment of the utility, the proposed resource plan, in conjunction with the deployment of DR measures, has sufficient resources to serve load forecasted for the implementation period;
    1. A NPVRR comparison of its proposal and reasonable alternatives over the planning period utilized in the analysis. It shall also include the calculation and comparison of the NPVRR of the utility's proposed resource plan and any alternative resource plans, including the alternative resource plans resulting from the Commission-approved modeling scenarios. ~~In addition, the utility shall provide support for its chosen discount rate and discuss how the results of its analysis would change with different discount rate assumptions;~~
    2. A detailed analysis of any benefits from resources that provide co-benefits to distribution or transmission planning (such as reliability and resiliency benefits), when those benefits are unable to be captured through capacity expansion modeling runs, to the extent that the co-benefits were relied upon for justification of resource decisions;
d) Include a detailed analysis for any resource type that the utility utilized an analysis outside of the integrated resource model to determine net-cost, external benefits, and additional value streams:
    1. Detail the net-cost method used when modeling any resource, where presumed benefits are netted against the costs of a resource to account for benefits outside of the model. A complete account of costs and assumed benefits should be provided such that the metrics and value given to achieving those metrics is clear and transparent;

2. Detail benefits and value streams that are outside of the model that are included in the utility justification for a resource. A detailed analysis should be transparently included in the utility filing; and
3. Detail how the utility considered whether benefits applied to one resource type are or are not also attributable to other resources.

XIX. The utility shall develop an implementation plan that specifies the major tasks, schedules, and milestones necessary to implement the proposed resource plan over the implementation period. The utility shall describe and document its implementation plan, which shall contain:

a) A schedule to report the status of an approved plan in accordance with MCL 460.6t(14);
b) A schedule and description of actions to implement ongoing and planned demand-side programs and demand-side rates;
c) A schedule and description of relevant supply-side resource research, engineering, retirement, acquisition, and construction;
d) A description of how, to the extent practical, the construction or investment in new resources in this state will be completed using a workforce composed of residents of this state;
e) A description of, to the extent practical, the construction of new resources in this state will be completed using materials sourced from this state; and
**f) A description of how the utility plans to meet the labor standards set out in PA 231 Section 6t(8)(c) for the construction of new generation capacity and rehabilitation of existing capacity resources.**

XX. Rate Impact, and Financial Information, **and Affordability**: **PCA only rate and affordability impact.** ~~Projected year-on-year impact of the PCA (and other feasible options) for the periods covered by the plan, covering the following accounts:~~

**a) The average rate impact by customer class (i.e., residential, C&I, etc.). The analysis shall include the Utility's most recently approved base rate revenue requirement for full-service customers, a forecast of the revenue requirement growth based on a projected inflation factor, the percentage of the production cost allocations assignable to each customer class, based on the prior approved rate case, and the estimated delta revenue requirement of the PCA to determine the average rate impact.**

1. The Utility shall identify the class allocation of the incremental revenue requirement, the class sales forecast and compare it to the current average rate, and class allocation of the incremental revenue requirement shown as a percentage.
2. This rate impact analysis should include the impact to customers as a result of PCA resources that are cost recovered using the PA 235, Section 22 revenue recovery mechanism.

**b) The utility shall show the affordability impact of the PCA as compared to its previously approved build plan. The utility shall describe its methodology and data sources including but not limited to income-based segmentation, publicly available data used, any limitations of data availability, proxies such as demographics or housing data, etc. Example methodology is in Appendix 2. If any identified income range is expected to increase an energy burden at or above 6%, the utility shall provide a discussion of available assistance, EWR programs and measures, or other options that could aid in mitigating the expected increased energy burden for the areas identified.[8]**

1. ~~Incremental Revenue requirement;~~
2. ~~Rate base;~~
3. ~~Plant-in-service capital accounts;~~
4. ~~Non-fuel, fixed O&M accounts;~~
5. ~~Non-fuel, variable O&M accounts;~~
6. ~~Fuel accounts;~~
7. ~~Emissions cost;~~
8. ~~Effluent additive costs; and~~
9. ~~Projected change in generation plant-in-service.~~

XXI. The utility shall describe the financial assumptions and models used in the plan. The resource plan shall include, at a minimum, the following financial information, together with

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[8] **This affordability analysis is based on publicly available data as of the time of filing. It relies on generalized assumptions and broad-based inputs to evaluate the affordability implications of the PCA in this IRP. The results are intended to inform the Commission's evaluation of long-term electric supply planning decisions in this IRP. This analysis serves as one step in advancing affordability considerations in resource planning and considers the impacts of resource investment only.**

supporting documentation and justification:

a) The general rate of inflation;
b) The allowance for funds used during construction rates used in the plan;
c) The cost of capital rates used in the plan (debt, equity, and weighted) and the assumed capital structure;
d) The discount rates used in the calculations to determine present worth;
e) The tax rates used in the plan;
f) NPVRR for the plan;
g) Nominal incremental revenue requirements by year; and
h) Average system rates per kWh by year.

XXII. Environmental Considerations, **Regulations, and** ~~Environmental Justice~~ **Emissions Analysis**: Describe how the utility's resource plan and any alternative resource plans presented in the application will comply with all applicable local, state, and federal environmental regulations, laws, and rules.

a) Include a list of all environmental regulations that are applicable to the utility fleet. Identify which regulations apply to which resources;
b) Include all capital costs for compliance with new and reasonably expected environmental regulations for existing fleet assets in the utility IRP;
c) Include a chart that compares the total projected carbon emissions under each scenario analyzed (no sensitivities applied), including quantifying the carbon emissions projected in each sensitivity as a percentage of the carbon emissions presented in the base scenario associated with that sensitivity. The utility shall identify and justify its use of a carbon accounting methodology, identified in Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases or other Commission approved methodology;[9]
d) If the Company is proposing retirement of an existing resource due to an environmental regulation, clearly identify the future capital cost for environmental regulations and other

[9] Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases, https://ghginstitute.org/wp-content/uploads/2019/04/EPRI-Wholesale-Power-Report-Published-2019.pdf, March 2019.

capital investments in the facility. If costs are identified as avoided capital costs, provide sufficient detail to support the capital cost as avoidable, meaning dollars will never be spent, or capital cost will simply be transferred to another cost category. For example, becoming cost of removal, or fully avoidable capital costs;

e) Hold a technical conference with MPSC and Department of Environment, Great Lakes, and Energy (EGLE) staff within 30 days after the filing to discuss the environmental and emission related data included in the filing testimony, exhibits, and workpapers; and

f) Identify, quantify, and provide evidence in the filing that shows progress in meeting any state, federal or utility announced carbon reduction goals. Illustrate how each optimized build plan for each MIRPP scenario (no sensitivities applied), the proposed resource plan, and the previously approved plan perform in meeting those goals throughout the planning period.[10, 11]

**XXIII. EGLE Advisory Opinion and Environmental Justice Analysis: Ensure the advisory opinion of EGLE in utility IRP cases is supported by a comprehensive health and environmental impact analysis in support of the State's environmental justice goals and Governor Whitmer's September 2020 Executive Directive 2020-10.**

a) Scope of portfolio build plans (herein referred to collectively as portfolios) evaluated as follows:
   1. Portfolio 1: Previously approved portfolio (status quo; PCA in previously approved IRP) run in the MIRPP Scenario 1 (optimized through the current study period);
   2. Portfolio 2: Utility PCA portfolio run in MIRPP Scenario 1;

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[10] Governor Gretchen Whitmer signed Executive Directive 2020-10 (ED 2020-10) regarding the urgent threat to the environment, economy, and the health and well-being of Michigan's residents posed by climate change and its implications. ED 2020-10 committed Michigan to pursuing a reduction of at least 26 to 28 percent in Greenhouse Gas (GHG) emissions below 2005 levels by 2025 and economy-wide carbon neutrality to be achieved no later than 2050 and maintained thereafter.

[11] April 22, 2021, President Joe Biden announced carbon reduction targets for the United States building upon carbon reductions to date. The new targets call for an economy-wide net GHG reduction of 50 to 52 percent from 2005 levels by 2030 and net zero GHG emissions economy-wide by no later than 2050.

3. Portfolio 3: Optimized portfolio in MIRPP Scenario 1;
4. Portfolio 4: Optimized portfolio in MIRPP Scenario 1 with high load sensitivity; and
5. Portfolio 5: If applicable a utility's reasonable alternative(s) to the PCA presented by the utility in MIRPP Scenario 1.

b) The utility will provide the following facility/unit level data and total annual fleet data, in an Excel spreadsheet(s) expressed in total tons, to EGLE for the following pollutants:
   1. Nitrogen oxides ($NO_x$)
   2. Carbon monoxide (CO)
   3. Particulate matter (PM)
   4. Lead (Pb)
   5. Mercury (Hg)
   6. Volatile organic compounds (VOC)
   7. Carbon dioxide ($CO_2$)
   8. **Sulfur dioxide ($SO_2$)**

**c) For each portfolio, identify existing facilities and potential future facilities with known locations, including peaking units, that are within 3 miles of communities specified for the Environmental Justice Analysis. Analyze all portfolios to quantitatively assess the projected emissions of identified facilities for each respective portfolio, and the differences in each portfolio's projected emissions for that unit relative to portfolio #2. Emissions should be reported in the appropriate unit of measure. If a utility does not have generation within a 3-mile radius of a community identified by the Environmental Justice Analysis, then an assessment is not required.** ~~Analyze all portfolios to identify and quantitatively assess the potential impacts to environmental justice overburdened communities and communities identified by the EJ analysis definition above, for existing facilities and for future facilities that have a known location. The utility will perform an Environmental Justice Screening using the Michigan Environmental Justice Screening Tool (MiEJScreen) by identifying communities with at least a 75th percentile composite score or a minimum percentile of 75 in either the Low Income Population or Black, Indigenous, People of Color population layers within a 3-mile radius of each facility for all facilities including peaking units. This assessment should address air emissions and/or conversion or early retirement and conversion of fossil fuel-fired facilities to the extent the plan includes either~~

~~conversion or retirement. If a utility does not have generation within a 3-mile radius of a environmental justice community identified by the EJ analysis, then an analysis is not required;~~

**d) Using the facilities identified in (c), above, quantitatively assess changes to air emissions from early retirement and conversion of fossil fuel-fired facilities to the extent the plan includes either conversion or retirement.**

**e)** Using the c**ommunities identified in c)**~~III~~, qualitatively assess the potential impacts of all portfolios including utility proposed early retirements, **retained**, ~~and/~~**or** ~~conversions~~ **converted** ~~of~~ fossil fuel-fired facilities. The **assessment** ~~analysis~~ should address water quality, waste disposal, and expected changes in land use for new or retiring resources to the extent known at the time of filing. **The assessment should evaluate whether the utility's proposed PCA reduces harm to the health and safety of individuals in Environmental Justice Analysis communities in comparison to the alternatives considered;**

**f)** To determine health impact estimates for air emissions, the utility will use the environmental Benefits Mapping and Analysis Program–Community Edition (BenMAP-CE), or the Co-Benefits Risk Assessment (COBRA) Health Impacts Screening and Mapping Tool~~, or a similar analytical tool with mapping features and spatial resolution down to at least the county level~~. Based on the pollutant parameters compatible with the chosen tool, this air emissions data analysis will be performed to provide health impact estimates. This includes:

1. **Assessment of annual** fleetwide health impacts **or benefits of any of the following:** ~~utility proposed~~ early retirement of fossil fuel-fired ~~facilities~~ units, conversions to a different fuel source(s), **and** newly constructed/acquired ~~fossil fuel-fired units~~ **generation units (to the extent the location is known and including renewable energy adoption, new fossil fuel-powered generation, nuclear, etc.)**.[12] ~~and renewable energy adoption. When the online version of an analytical tool does not have the data needed for analyzing a year where noteworthy emission changes are expected to occur, impacts can be estimated using emission changes from a year as near as reasonably possible to the intended analytical year or use of the desktop version of the analytical tool may be~~

[12] **If the online version of an analytical tool does not have the data needed for analyzing a year where noteworthy emission changes are expected to occur, impacts can be estimated using emission changes from a year as near as possible to the year of noteworthy emissions change. A desktop version of the analytical tool may also be used.**

~~needed.~~ **Using emission projections from section XXII subsection c), compare results for all portfolios with a focus on a comparison of portfolio #2 and #5 (if applicable) to portfolio #1** Results, including impacts and associated costs, will be presented for portfolios #1, #2 and #5 (if applicable) in comparison to portfolio #1 Impacts on environmental justice communities identified in the analysis will be completed in section III (within a 3-mile radius). Comparing to Portfolio #1 results (including impacts and associated costs) will be presented for all the other five listed portfolios.; and

g) **C**ounty level ~~COBRA~~ results **(or finer)** for any county that contains retired **(if location is known)**, ~~newly constructed/acquired,~~ or converted fossil fuel-fired units in **or within 3 miles of** communities identified by the EJ analysis.

6. ~~If a decrease in~~ **Assess** PM2.5 **and** NOX emissions ~~is not demonstrated at~~ **from** each individual electric generating unit **in portfolio #2** within a 6-mile radius of communit**ies specified for the Environmental Justice Analysis. If existing unit emissions for either pollutant increase above the historic variability of the unit, conduct emissions impact analyses for those units.** ~~identified including any new proposed units that could reasonably be expected to locate within the 6-mile radius, conduct dispersion modeling for PM2.5 including all electric generating unit(s) within a 6-mile radius of the community identified by the EJ analysis.~~ The current emissions should be used to establish a baseline ~~modeling demonstration~~ by which to compare the future impacts of portfolio #2 **units**. Any **analysis conducted pursuant to this item should include other emissions impacts on the area, as appropriate.** ~~dispersion analysis conducted pursuant to this item does not necessarily need to be a refined analysis. A screening analysis employing reasonable assumptions is acceptable. The refinement of the analysis is at the discretion of the utility.~~ The goal of this analysis is to assess how the overall ambient concentrations of PM2.5 **and Nox emissions may change** in communities **specified** ~~identified by~~ **for** the EJ analysis ~~may be affected~~ and to encourage **consideration of these impacts in the utility decision on the PCA** ~~an assessment of **the** ambient impacts in the siting of any new units;~~

h) For resources located within the nonattainment areas (or an area that may be designated nonattainment based on reasonably known information at the time of filing) in the electric

utility service territory, identify and assess their impact to the nonattainment status for the portfolio #2, listed above, as compared to portfolio #1, and qualitatively support in testimony. The assessment should consider all nonattainment pollutants (i.e., $SO_2$ and ozone), as well as their precursors (i.e., $NO_x$ and VOCs); and

i) Narrative discussion of the quantitative and qualitative health and environmental impacts, based on the analysis above, methodologies, data sources, and related observations. Explain how these considerations were taken into account in the utility's decision. **Discuss changes in health, safety, and welfare of individuals in environmental justice communities from the PCA as compared to the alternatives considered, including siting considerations for any proposed new generation.**

XXIV. Exhibits and Workpapers: The filing shall include exhibits and workpapers as outlined below, subject to any license or other confidentiality restrictions that are unable to be resolved by issuance of a protective order.

a) The Company shall include an exhibit containing a table that designates where each filing requirement is included within its testimony, exhibits, and workpapers, with appropriate page and section numbers;
b) The Company shall include an exhibit that depicts a stacked bar graph that includes the RTO capacity credit of all existing resources and new resources for all **required** scenarios, ~~and~~ sensitivities, **and any pertinent utility-proposed scenarios**, color designated by resource type, in each of the planning years. The graph shall have a line representing expected demand over the length of the planning period with the inclusion of the necessary planning reserve margin;
c) The Company shall include an exhibit of stacked bar graphs that include the energy expected to be produced by all existing resources, new resources, and market purchases for each planning year and for all MIRPP required scenarios and sensitivities. Each graph shall be color designated by resource type. Each graph shall have a line representing expected demand over the length of the planning period;
d) Include a chart that compares the total projected carbon emissions under each **required** scenario ~~and sensitivity analyzed~~**to the relevant sensitivities and build plans under that scenario**, including quantifying the carbon emissions projected in each sensitivity as a percentage of the carbon emissions presented in the base scenario associated with that

sensitivity. The utility shall identify and justify which of the carbon accounting methodologies it used for all scenarios and sensitivities. The methodology should be one identified in Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases or other Commission approved methodology;[13]

1. Any workpapers used in developing the application, supporting testimony, and IRP. Such workpapers shall, when possible, be provided in electronic format with formulas intact;

e) Any modeling input and output files used in developing the application, supporting testimony, resource plan, and any alternative plans. Such modeling input and output files shall, when possible, be provided in electronic format with formulas intact. The utility shall also identify each modeling program used and provide information for how interested parties can obtain access to such modeling program. Modeling inputs and outputs in the model-dependent binary format should be made available to parties that obtain a license;

1. Cost data, estimates, and co-benefit analyses that were used in the resource screening process or in any other way to determine resource selection of each resource that was considered either individually or in combination with other resources constructed as a single facility, including DERs, storage, and renewable energy resources;

f) A description, including estimated costs, of each alternative proposal received by the utility;

g) A discussion of any differences between its short-term fuel price forecasts and capacity price curve in the IRP filing, and the short-term fuel price forecasts and capacity price curve in its last power supply cost recovery plan proceeding;

h) Identification and justification of the forecasted price of energy, capacity, and fuels, and of peak demand and energy requirements used in the IRP. The utility shall identify its base case forecasts and a range of sensitivities for each such factor and explain how those

[13] Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases, https://ghginstitute.org/wp-content/uploads/2019/04/EPRI-Wholesale-Power-Report-Published-2019.pdf, March 2019.

sensitivities were identified. If the base case forecast(s) differs from recent previous forecasts submitted by the utility to the Commission in other cases, the utility shall provide an explanation for such differences;

1. 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 shall analyze the cost of compliance on its existing generation fleet going forward, including existing projects being undertaken on the utility's generation fleet;
2. Estimated annual emissions of $CO_2$ and greenhouse gases, particulates, $SO_2$, $NO_x$, and Hg per year and over the study period of the facilities included in their IRP;
3. The assumed retirement dates of the facilities included in the IRP, with justification provided for the assumed retirement dates; and
4. Other documents and data underlying the IRP **and CEP** analysis.

# Appendix 1 Analysis Requested by EGLE to Inform Advisory Opinion

~~Purpose: Ensure the advisory opinion of EGLE in utility IRP cases is supported by a comprehensive health and environmental impact analysis in support of the State's environmental justice goals and Governor Whitmer's September 2020 Executive Directive 2020-10.~~

~~I. Scope of portfolio build plans (herein referred to collectively as portfolios) evaluated as follows:~~

~~a) Portfolio 1: Previously approved portfolio (status quo; PCA in previously approved IRP) run in the MIRPP Scenario 1 (optimized through the current study period).~~

~~b) Portfolio 2: Utility PCA portfolio run in MIRPP Scenario 1.~~

~~c) Portfolio 3: Optimized portfolio in MIRPP Scenario 1.~~

~~d) Portfolio 4: Optimized portfolio in MIRPP Scenario 1 with high load sensitivity.~~

~~e) Portfolio 5: Reasonable alternatives to the PCA presented by the utility in MIRPP Scenario 1.~~

~~II. The utility will provide the following facility/unit level data and total annual fleet data, in an Excel spreadsheet(s) expressed in total tons, to EGLE for the following pollutants:~~

~~a) Sulfur dioxide ($SO_2$)~~

b) ~~Nitrogen oxides ($NO_x$)~~

c) ~~Carbon monoxide (CO)~~

d) ~~Particulate matter (PM)~~

e) ~~Lead (Pb)~~

f) ~~Mercury (Hg)~~

g) ~~Volatile organic compounds (VOC)~~

h) ~~Carbon dioxide ($CO_2$)~~

~~These data will be presented as raw numbers/units and as the aggregate change comparing the three portfolios – #1, #2 and #5. The methodology used to determine the emissions from the respective RTO purchases will be explained. The utility will propose a sample template of what would be provided in the IRP filing to EGLE for agreement 30 days before the filing.~~

~~III. Analyze all portfolios to identify and quantitatively assess the potential impacts to overburdened communities. The utility will perform an Environmental Justice Screening using the EPA Environmental Justice Screening and Mapping Tool (EJSCREEN) or the Michigan Environmental Justice Screening Tool (MiEJScreen). The analysis will include overburdened communities within a 3-mile radius of each facility for all facilities including peaking units. Overburdened communities will be identified using the EJ composite score recommended by the tool used. This may vary based upon differences between tools. Utilities are encouraged to use the MiEJScreen Tool to the extend practical. This assessment should address air emissions and early retirement of fossil fuel-fired facilities.~~

~~IV. Using the overburdened communities identified in the analysis completed in III, qualitatively assess the potential impacts of all portfolios including utility proposed early retirements of fossil fuel-fired facilities. The analysis should address water quality, waste disposal, and expected changes in land use for new or retiring resources to the extent known at the time of filing.~~

~~V. To determine health impact estimates for air emissions, the utility will use the environmental Benefits Mapping and Analysis Program- Community Edition (BenMAP-CE), the Co-Benefits Risk Assessment (COBRA) Health Impacts Screening and Mapping Tool, or a similar analytical tool with mapping features and spatial resolution down to at~~

least the county level. Based on the pollutant parameters compatible with the chosen tool, this air emissions data analysis will be performed to provide health impact estimates to assess:

a. Overall fleetwide health impacts of utility proposed early retirement of fossil fuel-fired facilities and renewable energy adoption. Results, including impacts and associated costs, will be presented for portfolios #1, #2 and #5.

b. Impacts on overburdened communities identified in the analysis will be completed in section III (within a 3-mile radius). Results, including impacts and associated costs, will be presented for all five listed portfolios.

VI. If a decrease in PM2.5 emissions is not demonstrated at each individual electric generating unit within a 6-mile radius of an identified overburdened community, including any new proposed units that could reasonably be expected to locate within the 6-mile radius, conduct dispersion modeling for PM2.5 including all electric generating unit(s) within a 6-mile radius of the identified vulnerable community. The current emissions should be used to establish a baseline modeling demonstration by which to compare the future impacts of portfolio #2. Any dispersion analysis conducted pursuant to this item, does not necessarily need to be a refined analysis. A screening analysis employing reasonable assumptions is acceptable. How refined the analysis is at the discretion of the utility. The goal of this analysis is to assess how the overall ambient concentrations of PM2.5 in vulnerable communities may be affected and to encourage an assessment of ambient impacts in the siting of any new units.

VII. For resources located within the nonattainment areas (or an area that may be designated nonattainment based on reasonably known information at the time of filing) in the electric utility service territory, identify and assess their impact to the nonattainment status for the portfolio #2 listed above as compared to portfolio #1, and qualitatively support in testimony. The assessment should consider all nonattainment pollutants (i.e., $SO_2$ and ozone), as well as their precursors (i.e., $NO_x$ and VOCs).

VIII. Narrative discussion of the quantitative and qualitative health and environmental impacts based on the analysis above, methodologies, data sources, and related observations. Explain how these considerations were taken into account in the utility's decision.

# Appendix 1 Acronym List

**BenMAP-CE:** Benefits Mapping and Analysis Program- Community Edition

**CO:** Carbon Monoxide

**COBRA:** Co-Benefits Risk Assessment

**CON**: Certificate of Necessity

**$CO_2$**: Carbon Dioxide

**DER**: Distributed Energy Resources

**DR**: Demand Response

**EGLE**: Department of Environment, Great Lakes, and Energy

**EJ**: Environmental Justice

**EJ SCREEN**: Environmental Justice Screening and Mapping Tool

**EWR**: Energy Waste Reduction

**Hg**: Mercury

**IRP**: Integrated Resource Plan

**ISO**: Independent System Operator

**kW**: Kilowatt

**kWh**: Kilowatt-hour

**LRZ**: Local Resource Zone

**MiEJScreen**: Michigan Environmental Justice Screening Tool

**MIRPP**: Michigan Integrated Resource Planning Parameters

**MPSC**: Michigan Public Service Commission or Commission

**MW**: Megawatts

**MWh**: Megawatt Hour

**$NO_x$**: Nitrogen Oxide

**NPVRR**: Net Present Value Revenue Requirement

**NWA**: Non-Wire Alternative

**O&M**: Operation and Maintenance

**Pb**: Lead

**PCA**: Proposed Course of Action

**PM**: Particulate Matter

**PPA**: Power Purchase Agreement

**REC**: Renewable Energy Credit

**RFP**: Request for Proposal

**RTO**: Regional Transmission Organization

**$SO_2$**: Sulfur Dioxide

**Staff**: Commission Staff

**USEPA**: United States Environmental Protection Agency

**VOC**: Volatile Organic Compounds

**ZRC**: Zonal Resource Credit

# Appendix 2: Example Affordability Methodology

1. **Calculate the projected rate and expected annual bill impact for the residential customer class for each year of the PCA using the most recently approved cost of service study. Annual cost adjustments shall reflect a rate of inflation at the time of filing.**
2. **Calculate the expected average annual energy cost for residential customers by household using publicly available data such as the U.S. Energy Information Administration's Residential Energy Consumption Survey Dashboard and forecast in nominal dollars for the first five years of the PCA. Annual cost adjustments shall reflect a rate of inflation at the time of filing.**
3. **Create an income distribution of the utility's service territory using publicly available data, such as B19001 Household Income in the Past 12 Months census data. Incomes for the first five years of the plan will be presented in nominal dollars and shall reflect a rate of inflation at the time of filing.**
4. **Calculate the expected impact of the PCA on Michigan households within the utility service territory by adding the annual bill impact of the PCA in (a), to a residential household's expected average annual energy cost in (b), for the first five years of the plan.**
5. **Based on the results of (d), calculate the expected energy burden percentage for each income range of the income distribution in (c) for the first five years of the plan.**