

Integrated Resource Plan

Filing Requirements

Pursuant to Public Act 341 of 2016, Section 6t

Application Instructions for Integrated Resource Plan Filings

These application instructions apply to a standard electric utility application for Michigan Public Service Commission (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 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announcement is not filed within 120 days after filing of the announcement, the filing announcement will be considered withdrawn. If a

¹Variations 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.

certificate of necessity (CON) is also being filed; the same filing announcement would serve as the filing announcement required for the CON.

The filing announcement shall include:

- a) Statement of intent to file an IRP.
- b) Estimated the 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.

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 with 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 proposals (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 competitive procurement guidance in Case No. U-20852, the Commission's code of conduct, and applicable state, federal, and Commission rules.
- d) The RFP shall allow for proposals to provide new supply-side capacity resources to partially meet the requirement, pursuant to MCL 460.6t(6).

- e) The RFP shall allow for proposals to provide new supply-side capacity in the form of a purchase power agreement for a period that is the lesser of the study period or of 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. The utility may choose to incorporate some, or all, of the participant input in its analysis and decision-making for the IRP filing.

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 the 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. Documentation may 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; and
- f) Discussion indicating if or how the public outreach process influenced the IRP.
- g) Include descriptions of community outreach efforts for vulnerable communities in the Company's service territory. Vulnerable communities should be identified using the MI EJ Screening Tool or other tools as noted in the Section XVIII.

A minimum of two stakeholder engagement workshops are recommended. A

stakeholder engagement workshop will provide 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 invite stakeholders, including expected intervenors and the Staff, to its stakeholder engagement workshops.

If the stakeholder engagement workshops are not open to the public, two additional public meetings are recommended. 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 public meetings should be offered in the utility's service territory in geographic locations convenient to customers, with advanced notice provided to customers in the utility's service territory. The utility is encouraged to consider holding public meetings after normal business hours to encourage attendance.

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 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 analysis of the proposed resource plan and the optimal plans for each of the scenarios specified in the Michigan Integrated Resource Planning Parameters (MIRPP), as well as all additional scenarios and sensitivities filed with the IRP application. The 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 and the PCA for each scenario to determine how each strategy would perform in an unexpected range of possible futures. The risk assessment methodology should incorporate the potential impacts of climate change in the forecasts for input variables.^{1,2} Utilities are

¹ <https://glisa.umich.edu/summary-climate-information/>

² <https://ccr.nelson.wisc.edu/>

encouraged to link variables that are correlated to or dependent upon one another. The IRP shall include a discussion of the methodology used for risk analysis including the utility's justification for the chosen methodology over other alternatives. Acceptable forms of risk analysis 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.

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. DER includes both generators and energy storage technologies capable of exporting active power to a distribution system.

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

Vulnerable, Disadvantaged, Underserved Communities – to be defined in coordination with EGLE. See Appendix IV below.

Demand-side Resources - Resources serve resource adequacy needs by reducing load, which reduces the need for additional generation including but not limited to EWR, DR,

grid and software controls, Behind the meter resources, distribution connected storage, etc.

Co-Benefits – Benefits that are quantified as part of another planning or an evaluation process that are important to the justification of a resource included in the integrated resource plan. Examples include benefits to distribution planning or evaluation of multiple revenue streams.

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:

- I) For specific supply-side resources (inclusive of storage technologies) of less than 225 megawatts (MW) (this threshold shall be applied to the nameplate capacity of a project, not individual generators, storage facilities, etc.), that are planned to go into service 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:
 - i. Description of fuel use, both primary and back-up, and provisions for transporting and storing fuel;
 - ii. Projected annual costs, in accordance with the breakdown specified in the Federal Energy Regulatory Commission Uniform System of Accounts; and
 - iii. 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.
 - d) Projected property taxes.

- e) The rates of escalation of cost, including:
 - i. Capital costs.
 - ii. O&M costs which are variable and related to fuel.
 - iii. O&M costs which are variable and unrelated to fuel.
 - iv. 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 power purchase agreements and company owned. Reference the most recent Commission approved Competitive Procurement Guidelines.
- II) Renewable Resources: The utility shall file data consistent with its renewable energy plan. (For incremental renewable energy beyond the 15% requirement in 2021 and any renewable energy to be constructed or purchased after the conclusion of the 20-year renewable planning period ending in 2029, the utility shall file as set forth below.) Revenue requirement and incremental costs of compliance shall be calculated to include the following:
- a) Capital, operating and maintenance 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) Ancillary service costs.
- e) Cost of purchased renewable energy credits (RECs) other than those purchased for non-compliance.
- f) Cost of Contracts.
- g) Expenses incurred as a result of governmental action including changes in tax or other laws.
- h) Subtract revenues (i.e., transfer price, environmental attributes, interest on regulatory liability, etc.) through 2029.
- i) 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).
- j) Provide the following information in relation to renewable resource cost recovery:
 - i. Forecast through the end of the renewable plan period of the non-volumetric surcharge; and
 - ii. Forecast through the end of the renewable plan period of the regulatory liability balance.
- k) Procurement strategy, including power purchase agreements and company owned. Reference the most recent Commission approved Competitive Procurement Guidelines.
- l) A description of the 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.

III) Energy Waste Reduction: The utility shall provide the following information in relation to energy waste reduction programs cost approval and recovery. For each individual program or group of programs, provide:

- a) Total annual cost including:
 - i. Annual O&M cost for each individual portfolio of energy waste reduction programs.
 - ii. Annual capital cost for each individual portfolio of energy waste

reduction.

- iii. 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.
- c) Maximum single event demand reduction.
- d) Total resource capacity (MW) and type reported to the applicable regional transmission organization (RTO)/independent system operator (ISO).
- e) Total energy reduction achieved in megawatt-hours (MWh).
- f) Description of program, including customer enrollment, technology used, and marketing plan.

IV) Demand Response and DER Programs:

The utility shall provide the following information in relation to demand response programs and DER programs cost approval and recovery. For each individual program or group of programs, provide:

- a) Total annual cost including:
 - i. Annual O&M cost for each individual program of demand response and DER programs.
 - ii. Annual capital cost for each individual program of demand response and DER programs.
 - iii. 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.
- c) Maximum single event demand reduction.
- d) Total resource capacity (MW) and type (load modifying resource, emergency demand response, etc.) reported to the applicable regional transmission organization (RTO)/independent system operator (ISO).
- e) Total energy reduction achieved (megawatt-hours (MWh)); and
- f) 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 ten 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; and
- d) 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 analysis results influenced the utility's proposed course of action.
- h) The Company shall include a graph that depicts a stacked bar graph that includes the RTO capacity credit³ 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 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 graph 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 NOx, So2, CO, PM, Pb, Hg, VOC, CO2. 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) 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 the where in the filing it has met all of 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

³ For example, MISO Zonal Resource Credit.

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:
 - i. Net present value of utility revenue requirements,²⁴ with and without any financial performance incentives for demand-side resources.
 - ii. Revenue requirement of existing generation and power purchase agreements.
 - iii. Summary of existing generation and power purchase agreements by fuel type.
 - iv. Utility's existing capacity resource mix.
 - v. Utility's service territory and breakdown of customer class composition; and
 - vi. Description of planning period analyzed.
- b) Statement of power need.
- c) Identify and explain the basis for the forecasted price of energy, capacity, and fuels, and of peak demand and energy requirements, for each year of the analysis 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:
 - i. RTO market and state regulation structure if a multistate utility.
 - ii. Potential changes to RTO capacity market.
 - iii. Electric customer choice.
 - iv. Transmission expansion.
 - v. Environmental.
 - vi. Renewable portfolio standards; and
 - vii. Other.
- e) IRP planning process; and
- f) Stakeholder report.

IV) Analytical Approach:

⁴ ²The assumed discount rate shall be included along with a justification for the assumed discount rate. Results should be presented in nominal dollars

- 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 monthly generation profiles, forced outages, derates, seasonal or limited availability of resources, etc.
- c) Describe and provide a justification for the risk analysis approach adopted from the Risk Assessment Methodology section:
 - i. The utility shall describe and document its quantification of the risk that affects the evaluation of the various resource plan options.
 - ii. The utility shall provide a tabulation of the key quantitative results of that analysis and a discussion of how those findings affected its decision on a resource plan.
 - iii. 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.
- 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 for 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.
- 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, or as revised by subsequent Commission orders related to IRP modeling parameters and requirements.

VI) Existing Supply-Side (Generation) 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) Power purchase agreements: energy and capacity purchased or produced by the utility from a contracted resource, including any cogeneration resource.
- h) RTO capacity credits and modeling of existing units (such as capacity factor, heat rate, outage rate, in-service and retirement dates, operating costs, etc.).
- i) Spot market purchases and off-system sales.

VII) Demand-Side Resources:

Historical and projected load management and demand response programs for the utility in terms of MW and Midcontinent Independent System Operator, Inc., Zonal Resource Credits (ZRCs) and the projected costs for those programs.

- a) Provide data on projected enrolled capacity and demand response events for each program. The following items are to be included:
 - i. Description of current demand response 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.

- ii. Review the historic performance of existing demand-side programs in delivering benefits and how the utility used such information in its demand response resource decisions.
- iii. Describe the utility's method for determining whether to purchase energy rather than relying on demand response.
- iv. A description of any other programs the utility is considering that could potentially expand demand response resources, including expected load reductions and operating parameters.

VIII) Renewables and Renewable Portfolio Standards 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 renewable energy credit 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 required by the Michigan Legislature (e.g. 35% combined renewable energy and energy waste reduction 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.

The following non-exhaustive list suggests several elements that may be included:

- a) Sales forecast through 2021 for compliance with the renewable energy standard, through 2025 toward meeting the 35% goal, and through the study period.
- b) Detailed resource plan:
 - i. Describe the utility's planned renewable energy credit portfolio.
 - ii. Forecast RECs obtained via Michigan incentive RECs.
 - iii. Forecast expected compliance levels by year to meet the renewable portfolio targets.
 - iv. Identify key assumptions used in developing these forecasts and the proposed resource portfolio.
 - v. Identify risks which may drive performance to vary.

IX) 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 energy waste reduction 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, and the actions the utility proposes to take in order to achieve that peak demand reduction.
- b) Subsections:
 - i. Key variables used to develop forecast.
 - ii. Long-term forecasting methodology.
 - iii. Forecasting uncertainty and risks.
 - iv. Historical growth in electric sales for the previous five years, including a record of its previous load forecasts (can be supplied in workpapers).
 - v. Base Case deliveries and demand forecast.
 - vi. 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.

- vii. Include detailed information about how the forecasts used for IRP modeling align with forecasts used for distribution planning.
- viii. Detail information about distributed energy resource adoption and operation.
- ix. Detail electric vehicle adoption assumptions and impacts to overall peak demand and energy forecasts.
- x. Detail additional electrification adoption assumptions and impacts to overall peak demand and energy forecasts.

X) **Capacity and Reliability Requirements:**

The utility shall indicate how it complies, and will comply, with all finalized state federal, ISO, RTO capacity and reliability regulations, laws, rules and requirements, (such as planning reserve margins, system reliability and ancillary service requirements) including the projected costs/revenues of complying with those regulations, laws, and rules. The utility shall identify any finalized changes to the applicable state, federal, ISO, or RTO capacity and reliability regulations, laws, rules and 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.

XI) **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 their 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 a 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. To inform the IRP process and assumptions, a meeting schedule should be set in advance. The filing should include the pre-decided meeting schedule, any documentation that supports requested extensions of the initial pre-decided timing, and a summary of meetings that ultimately took place.
- 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) Any information provided by their local transmission owner indicating the anticipated effects of fleet changes proposed in the IRP on the local resource zone's (LRZ) capacity import limit (CIL) 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 import or export capability; (2) facilitating power purchase agreements 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, 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 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.
- j) Provide RTO reports or web links to report locations that contain information relied upon to support model assumptions or other IRP decisions.

XII) 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; and
- 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.

XIII) 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, build a new facility, purchasing capacity from the market

on a short-term basis, and purchasing capacity through a power purchase agreement. 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 of each resource option and combination of resource options shall be provided with the utility's filing:

- a) Existing and planned resources.
- b) New build:
 - i. New generation technology and operating assumptions.
 - ii. New generation development costs.
 - iii. New energy integration of storage technology and operating assumptions; including all storage options.
 - iv. New energy storage development costs.
 - v. Development costs and operating assumptions for combinations of resources constructed as a single facility.
- c) Distributed Energy Resources inclusive of non-wires alternatives identified in other planning processes.
- d) Demand-side Resources inclusive of non-wires alternatives identified in other planning processes.
- e) Market capacity purchases:
 - i. Regional market supply outlook.
 - ii. Availability of market capacity.
 - iii. Market capacity price assumptions.
- f) Long-term power purchase agreements.
- g) Transmission resources:
 - i. Overview.
 - ii. Existing import and export capability.
 - iii. Transmission network upgrade assumptions for the IRP; and
 - iv. Import and export impact on resource strategy.

XIV) 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 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 revenue requirements, present value of annual revenue requirements and netpresent value of revenue requirements, and portfolio capacity including additions and retirements. Include monthly and annual energy pricing, and resource capacity and load factors.
- c) Base case portfolio options to be selected from.
- d) Analysis of IRP results.
- e) Risk assessment presented with graphics and data that illustrate stochastic risk analysis results 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.

XV) 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 power purchase agreements.
- 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 proposed course of action.

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; and
- c) In the judgment of the utility, the proposed resource plan, in conjunction with the deployment of demand response measures, has sufficient resources to serve load forecasted for the implementation period.

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 net present value revenue requirement 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 net present value revenue requirement 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.
- e) A detailed analysis of any benefits from resources that provide co-benefits to distribution or transmission planning (such as reliability and resilience 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.

- f) 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.
- g) A description of, to the extent practical, the construction of new resources in this state will be completed using materials sourced from this state.

XVI) Rate Impact and Financial Information:

Projected year-on-year impact of the proposed resource plan (and other feasible options) for the periods covered by the plan, covering the following accounts:

- a) Revenue requirement.
- b) Rate base.
- c) Plant-in-service capital accounts.
- d) Non-fuel, fixed operations and maintenance accounts.
- e) Non-fuel, variable operations and maintenance accounts.
- f) Fuel accounts.
- g) Emissions cost.
- h) Effluent additive costs; and
- i) Projected change in generation plant-in-service.

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 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) Net present value of revenue requirements for the plan.
- g) Nominal revenue requirements by year; and
- h) Average system rates per kWh by year.

If the utility is proposing retirement of generation facilities that are expected to have an undepreciated book balance at the time of retirement, the utility shall include an analysis of various financing options for the remaining book balance if the utility is asking for specific treatment of the undepreciated book balance in its IRP. The utility shall:

- a) include an analysis of various financing options for the remaining book balance.
- b) identify the impact the different financing options have on the net present value revenue requirement of the proposed resource plan over the entire planning horizon.
- c) provide detail to support how the financing treatment requested is the most reasonable and prudent financing means.

XVII) 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 and sensitivity analyzed, 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 counting methodology identified in Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases.⁵
- d) If the Company is proposing retirement of an existing resource, clearly identify the capital cost for environmental regulations and

⁵ Electric Power Research Institute, Methods to account for Greenhouse Gas Emissions Embedded in Wholesale Power Purchases⁵, <https://ghginstitute.org/wp-content/uploads/2019/04/EPRI-Wholesale-Power-Report-Published-2019.pdf>, March 2019

other capital investments in the facility. Costs that are identified as avoided capital costs shall also be identified as avoided capital costs due to becoming cost of removal, or fully avoidable capital costs.

- e) Hold a technical conference with MPSC and EGLE staff within 30 days after the filing to discuss the environmental and emission related data included in the filing testimony, exhibits, and workpapers.
- f) Provide emission data to inform the Department of Environment, Great Lakes, and Energy Advisory Opinion consistent with the specifications in Appendix A.
- g) 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, the proposed resource plan, and the previously approved plan perform in meeting those goals throughout the planning period.^{6 7}

XVIII) 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 scenarios and sensitivities, 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 that depicts a series of

⁶ 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.

⁷ 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.

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 scenario and sensitivity analyzed, 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 counting 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.⁸
- e) Any workpapers used in developing the application, supporting testimony, and IRP. Such workpapers shall, when possible, be provided in electronic format with formulas intact.
- f) 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.
- g) 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 electric resource that was considered either individually or in combination with other resources constructed as a single facility, including distributed energy resources, storage, and renewable energy resources.
- h) A description, including estimated costs of each alternative proposal

⁸ <https://ghginstitute.org/wp-content/uploads/2019/04/EPRI-Wholesale-Power-Report-Published-2019.pdf>, March 2019.

received by the utility.

- i) 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 proceeding.
- j) 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.
- k) 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.
- l) Estimated annual emissions of carbon dioxide and greenhouse gases, particulates, sulfur dioxides, oxides of nitrogen, and mercury per year and over the life of the facilities included in their IRP.
- m) The assumed retirement dates of the facilities included in the IRP, with justification provided for the assumed retirement dates.
- n) An analysis that contains an individualized cost estimate for electric resources that were considered, including renewable alternatives, such as solar, wind, or solar plus storage, and such cost estimates for all alternative proposals, solicited or unsolicited, received by the utility.
- o) Electricity market forecasts utilized.
- p) Other documents and data underlying the IRP analysis.

Appendix 1

- I. Scope of Portfolio Build Plan Evaluated in Scenarios as follows (herein referred to collectively as portfolios):
 - 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 proposed course of action (PCA) portfolio run in MIRPP Scenario 1.
 - c. Portfolio 3: Optimized portfolio in MIRPP Scenario 1.
 - d. Portfolio 4: Optimized portfolio in 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:
 - a. Emissions of the following:
 - b. sulfur dioxide (SO₂)
 - c. nitrogen oxides (NO_x)
 - d. carbon monoxide (CO)
 - e. particulate matter (PM)
 - f. lead (Pb)
 - g. mercury (Hg)
 - h. volatile organic carbon (VOC)
 - i. carbon dioxide (CO₂)

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 regional transmission organization 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 vulnerable communities (as defined collaboratively with EGLE). The utility will perform an Environmental Justice Screening and Mapping Tool (EJSCREEN) or the Michigan Environmental Justice Screening Tool (Mi EJSCREEN). The screening will include vulnerable communities within a 3-mile radius of each facility for all facilities. This quantitative assessment should address air emissions and early retirement of fossil fuel-fired facilities. Explain how these considerations were considered in the utility's decision.
- IV. Using the vulnerable communities identified in the analysis above, qualitatively assess the 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 vulnerable communities identified above (within a 3-mile radius). Results, including impacts and associated costs, will be presented for all five listed portfolios.
- VI. If a decrease in PM_{2.5} emissions is not demonstrated at all electric generating unit(s) within a 6-mile radius of an identified disadvantaged community, including any new proposed units that could reasonably be expected to locate within the 6-mile radius, conduct dispersion modeling for PM_{2.5} including all electric generating unit(s) within a 6-mile radius of the identified disadvantaged 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, doesn't 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 ambient concentrations of PM_{2.5} 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 non-attainment 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 non-attainment 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., SO₂ 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 considered in the utility's decision.
- IX. Hold a technical conference with MPSC and EGLE staff within 30 days of the filing to discuss the environmental and emission related data included in the filing testimony, exhibits and workpapers.