MI Power Grid: Phase III Advanced Planning Processes

Feedback from March 24, 2022
Stakeholder Meeting

April 6, 2022

VIA E-MAIL at GibbsK2@Michigan.gov

RE: Consumers Energy Comments to Staff on Michigan Integrated Resource Planning Parameters ("MIRPP") and Integrated Resource Plan ("IRP") Filing Requirements

Dear Ms. Gibbs:

The Company appreciates Staff's efforts leading the Advanced Planning Phase III workgroup collaborative discussions on March 24, 2022. The Company thanks Staff for providing the opportunity for discussion and comment.

The Company requests consideration of the following comments in response to Staff's request for feedback about the approach to environmental considerations discussed in the IRP discussed during the meeting:

1. **Utility approaches to incorporating the impacts of climate change in IRP**

   The Company looks forward to continuing to discuss the topic of climate change as it relates to integrated resource planning, and thanks Staff for inviting Michigan utilities to present on this topic during the March 24th stakeholder session.

2. **Proposed language for Scenario #2**

Please see below for the Company's feedback on the updated language proposed for Scenario 2:

Scenario 2 Proposed Language:

- "Utilities should use the most recent EIA AEO East North Central Census Region Reference Case for forecasted EV adoption rates with a multiplier of 5 to illustrate significant advancements in EV adoption. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand."
  AND
- "Utilities should use the most recent EIA AEO Reference Case for forecasted EV adoption rates. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand."

Consumers Energy
1945 W Parnall Rd
Jackson, MI 49201

800-477-5050
ConsumersEnergy.com

Company Response:

- The Company does not support the requirement to use third party forecasts for electric vehicles at a national or regional level, such as the EIA AEO North Central Reference case as described. These forecasts are based on adoption numbers of electric vehicles, not the associated impact on load and demand curves; it will be labor intensive as well as likely inaccurate to try and convert high level forecasts such as these into meaningful numbers that translate to impacts on utility electric demand. Furthermore, the need to "carve out" regional and utility specific allocation of EV growth, from the dataset, is unclear. Further discussion is requested for the proposal to use population data or other metrics in order to justify or support this methodology.
- Instead, the Company proposes consistency with MISO Futures, which already incorporates projected electric vehicle penetrations for each zone, including Zone 7. It is more appropriate to use the MISO Futures, in this case Future 3, as a baseline for electric vehicle adoption that will then be translated into the load forecast developed for the overall MISO region during the IRP planning period. Specifically, the Company proposes modifying the language as follows:

~~Utilities should use the most recent EIA AEO East North Central Census Region Reference Case for forecasted EV adoption rates with a multiplier of 5 to illustrate significant advancements in EV adoption. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change2, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand.~~

For utility-specific impacts of EV adoption on energy and peak demand, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand. The utility-specific EV adoption rates should be consistent with the MISO Future 3 EV growth rates in Zone 7.
MISO footprint-wide EV adoption should be consistent with levels identified in the MISO Future 3 load assumptions. Similar growth rates should be assumed in PJM.

- As stated in previously filed comments, the Company believes it is most appropriate for each utility to develop electric vehicle and electrification forecasts based on the knowledge of its service territory and Michigan specific

adoption levels. These forecasts can be made available within the filing and justified by the utility with regards to supporting data.

Scenario 2 Proposed Language:

- "non-carbon dioxide emitting resources will be increased, due to the constraint on allowable carbon emissions in the model"

Company Response:

- The Company proposes to strike this language as it is not needed; carbon target and constraints for the model are already defined earlier in the scenario description, and therefore it is not needed to specifically infer that non-carbon dioxide resources will increase

Scenario 2 Proposed Language

- "Market energy purchases are modeled at a carbon intensity consistent with the relevant RTO system average. ~~MISO expected system averages are identified in Future 3~~"

Company Response:

- The Company requests that the last statement be stricken from the Scenario #2 description. As discussed, while MISO Future 3 retirement assumptions will be used to develop the scenario, each utility may have its own new-resource set of expansion plans. Since the mix of resources will vary, by utility filing, the expected system average should be determined based on those set of expansion plans, not taken from the MISO Future 3's expansion plans resulting system averages.

3. <u>Proposed Language for Scenario #1</u>

Please see below for the Company's feedback on the updated language proposed for Scenario 1:

Scenario 1 Proposed Language:

- "Utilities should use the most recent EIA AEO Reference Case for forecasted EV adoption rates."
  AND
- "Moderate EV adoption and customer electrification result in moderate footprint-wide demand and energy growth. Within Michigan, EV and electrification forecasts should be blended with historical sales such that after 5 years, Michigan's load and demand increase reflects the source forecasts for EV and electrification technologies."

Company Response:

- As stated in the above feedback to proposed language for Scenario 2, the Company does not support use of national or regional forecasts to set EV adoption levels, but instead believes it is more appropriate and accurate for the utility to develop and justify their own electric vehicle forecasts and the associated impacts on energy and demand.
- The Company previously provided suggested wording (in its February 9, 2022 comments) for MISO footprint wide assumptions related to EV adoption as follows:

  This scenario assumes that demand and energy growth are driven by existing economic factors, with moderate EV adoption and customer electrification, resulting in moderate footprint wide 24 demand and energy growth rates.

  Further, the Company suggests modification of the detailed bullet point as follows:

  Moderate EV adoption and customer electrification result in moderate footprint-wide demand and energy growth. Within Michigan, EV and electrification forecasts should be **consistent with the MISO Future 1 EV growth rates for Zone 7.** ~~***blended with historical sales such that after 5 years, Michigan's load and demand increase reflects the source forecasts for EV and electrification technologies.***~~

Scenario 2 Sensitivity Comments and Feedback:

- Load forecast sensitivities
  - High load growth sensitivity - the Company requests further definition as to what is meant by a "per customer basis" regarding energy and demand growth rates. Does that indicate that each customer increases their energy usage by at least a factor of two?
  - As a note, it appears that the MISO load growth sensitivity in this most recent draft appears at the end of sensitivity 2a as opposed to being listed as its own sensitivity.

Respectfully submitted,

Consumers Energy Company

DTE Electric Comments Regarding Staff's
MI Power Grid– Advanced Planning Phase III
April 4, 2022

On December 15, 2021, Michigan Public Service Commission's Staff prepared initial redlined Integrated Resource Planning (IRP) filing requirements and Michigan IRP Parameters (MIRPP). These were further discussed at the January 31st, February 28th, and March 24th meetings.

DTE appreciates the effort of the Michigan Public Service Commission (MPSC), MPSC Staff (Staff) and all parties involved in this integrated planning collaborative.

Staff asked for feedback on the following:

1. Proposed language for Scenario #2
2. Utility approaches to incorporating the impacts of climate change in IRP

DTE Electric Comments Regarding Staff's
MI Power Grid– Advanced Planning Phase III
April 4, 2022

1. Scenario #2 feedback

Please see comments made directly on the word version – attachment 01DTE Comments_Scenario 2 Rewrite 04_04_2022.

2. Utility approaches to incorporating the impacts of climate change in IRP

DTE presented two potential approaches to addressing climate change in the load forecast at the March 24th Collaborative meeting. Handling extreme weather and climate change with both stochastic risk assessment and load forecast sensitivities can be duplicative.

DTE recommends leaving this requirement as non-prescriptive and allowing each utility to determine how to address climate change and extreme weather in an IRP recognizing that each utility uses different models and processes for both load forecasting and IRP risk assessment.

DTE looks forward to further discussions and collaboration with Staff and industry stakeholders on Michigan's integrated planning process.

DTE Energy

3.23.22 Draft of MIRPP Scenario #2

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

This scenario assumes significant advancements toward electrification that drives a total energy and demand growth rates to 1.71% and 1.41% respectively. Emissions decline, driven by state goals and utility plans throughout the MISO footprint, ~~creating~~ create at least an 80% carbon reduction by 2040 from the baseline year of ~~2025~~ 2005 for the MISO region. Assume similar reductions from PJM. This trajectory of carbon reduction is expected to continue beyond 2040. Utilities should use the most recent EIA AEO East North Central Census Region Reference Case[1] for forecasted EV adoption rates with a multiplier of 5 to illustrate significant advancements in EV adoption. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change[2], electrification, demand side resources (excluding Demand Response), and customer owned distributed generation and how these factors ~~change~~impact overall load and demand.

- Natural gas prices utilized are consistent with Reference Case projections from the United States Energy Information Administration's (EIA) most recent annual Energy Outlook.
- Current demand side resources and utility distributed generation programs remain in place and additional growth in those programs would happen if they were economically selected by the model to help comply with the specified carbon reductions in this scenario.
- EV adoption and customer electrification adoption cause adjustments in overall load profiles throughout the planning horizon.
- Non-nuclear, non-coal generators will be retired in the year the age limit is reached and driven by announced retirements. Coal units will primarily be retired based upon carbon emissions and secondarily

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

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

Commented [A1]: DTE comment - recommend updating to 2005, as clarified on the call.

Commented [A2]: DTE Comment - We have concerns that if the most recent is updated to a higher level of EV adoption, then applying a multiplier of 5 may create a forecast that is higher than intended. Suggest removing everything after EV adoptions rates

Commented [A3]: DTE Comment- since utilities may model demand side resources as supply side resources, recommend striking "demand side resources" from here.

Commented [A4]: DTE Comment - see suggested changes; " the word change" implies this is being compared to something

Commented [A5]: DTE Comment - Depending on the modeling methods used by the utilities, demand side resources may not directly reduce carbon. Recommend ending sentence after "...selected by the model." and striking the rest.

Commented [A6]: DTE comment - Seek clarification on what is the age limit? Also, is this needed with the direction at the top to use the retirements as identified in MISO future 3?

Should this be reworded to say, "Non-nuclear, non-coal generators will be retired as identified in MISO Future 3."

based upon economics. Nuclear units are assumed to have license renewals granted and remain online.

- Utilities should use the most recent EIA AEO Reference Case[3] for forecasted EV adoption rates. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change[4], electrification, demand side resources, and customer owned distributed generation and how these factors ~~change~~impact overall load and demand.
- Specific new units are modeled if under construction or with regulatory approval (i.e., IRP cost pre-approval, CON, or signed GIA).
- Not less than 35% of the state's electric needs should be met through a combination of EWR and renewable energy by 2025, as per MCL 460.1001 (3).
- The utility can illustrate how the plan is expected to meet state goals for greenhouse gas emissions specific to the power industry sector.
- Existing renewable energy production and storage tax credits and renewable energy investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- Long and short duration storage resources are considered. Energy storage resources are modeled using available best practice methodologies to the extent that such guidelines exist. Allow for multiple market revenue streams where applicable.
- Technology costs for wind, solar, storage and other renewables decline with commercial experience and forecasted at levels 30% reduction from scenario 1 by the end of the study period.
- Non-carbon dioxide emitting resources will be increased, due to the constraint on allowable carbon emissions in the model.
- Technology costs and limits to the total resource amount available for EWR and demand response programs will be determined by their respective state-wide potential study.

- Existing PURPA contracts are assumed to be renewed. Existing PURPA QFs up to the utility's "must buy" obligation MW threshold are assumed to be renewed unless the QF indicates otherwise either publicly or directly to the utility.
- Existing PURPA QFs greater than the utility's "must buy" obligation MW threshold are assumed to continue operations within the wholesale market beyond the termination date of the contract unless the QF indicates otherwise either publicly or directly to the utility.

Scenario #2 Sensitivities:

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

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

Commented [A7]: DTE comment - This also seems in opposition to the MISO Future 3 language. Maybe just reiterate, "This scenario incorporates the retirement announcements and assumptions throughout the MISO footprint, as identified in Future 3." instead of this whole bullet.

Commented [A8]: DTE Comment - This is in conflict with the instruction to use the most recent EIA AEO East North Central Census Region Reference Case1 for forecasted EV adoption rates with a multiplier of 5 above.

Commented [A9]: DTE Comment- since utilities may model demand side resources as supply side resources, recommend striking "demand side resources" from here.

Commented [A10]: DTE comment – see above

Commented [A11]: DTE Comment - This should be for units in the Utility's Zone only. e.g. MISO zone 7 for DTE. Renewables approved in REP or VGP cases should be added to the list.

Commented [A12]: DTE comment - This is very non-specific and should already be covered in the environmental filing requirements section. Recommend striking this.

Commented [A13]: DTE comment - Suggest deleting and starting with Storage resources….

Commented [A14]: DTE comment – recommend defining the preferred declination change

Commented [A15]: DTE comment - Recommend adding "most recent respective statewide study available at the commencement of modeling."

1. Fuel cost projections

Increase the natural gas fuel price projections from the base projections to at least the high EIA gas price in the most recent EIA Low Oil and Gas Supply forecast natural gas fuel price projections at the end of the study period. [28]

2. 80% carbon reduction in the utility's service territory, modeled as a hard cap on the amount of carbon emissions, by 2030 as a sensitivity.[29]

3. Ramp up the utility's EWR savings to at least 2.0%[30] of prior year sales over the course of four years, using EWR cost supply curves provided in the 2021 supplemental potential study for more aggressive potential.[31] EWR savings remain at 2% throughout the study period.

Commented [A16]: DTE comment - Recommend adding "most recent respective statewide study available at the commencement of modeling."

ACEEE comments and recommended edits (040122)

3.23.22 Draft of MIRPP Scenario #2

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

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- Current demand side resources and utility distributed generation programs remain in place and additional growth in those programs would happen if they were economically selected by the model to help comply with the specified carbon reductions in this scenario.
- EV adoption and customer electrification adoption cause adjustments in overall load profiles throughout the planning horizon.
- Non-nuclear, non-coal generators will be retired in the year the age limit is reached and driven by announced retirements. Coal units will primarily be retired based upon carbon emissions and secondarily

Commented [MK1]: This makes the inputs and assumptions used regarding these demand-side resources critically important. If incorrect or unnecessarily pessimistic inputs and assumptions are utilized, the modeling will select less of the EWR resource than would actually be desirable. See concerns on next page.

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

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

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- Technology costs for wind, solar, storage and other renewables decline with commercial experience and forecasted at levels 30% reduction from scenario 1 by the end of the study period.
- Non-carbon dioxide emitting resources will be increased, due to the constraint on allowable carbon emissions in the model.
- ~~Technology costs and limits to the total resource amount available for EWR and demand response programs will be determined by their respective state-wide potential study.~~
- Technology costs and limits to the total resource amount available for EWR and demand response programs will be informed by the prior EWR potential studies conducted by Guidehouse and GDS, and should be augmented as necessary by additional research conducted in collaboration with stakeholders.
- Existing PURPA contracts are assumed to be renewed. Existing PURPA QFs up to the utility's "must buy" obligation MW threshold are assumed to be renewed unless the QF indicates otherwise either publicly or directly to the utility.

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

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

Commented [MK2]: This is clearly an optimistic assumption that will provide a boost to wind, solar, and storage. Curious why no similar optimistic assumption for EWR? This discrepancy is particularly significant given the problems with the 2021 EWR potential study noted below.

Commented [MK3]: This original language basically says the amount of EWR that will be considered available will be limited by the EWR potential study. That is a huge problem if this is intended to refer to the 2021 EWR potential study conducted by Guidehouse.

As I have explained elsewhere https://mi-psc.force.com/sfc/servlet.shepherd/version/download/0688y000002HlsgAAC that study contains a number of flawed assumptions, and greatly understates the EWR potential. e.g., to put some numbers on this, that study claimed that under their so-called "Aggressive Scenario" that EWR potential was only an average of 1.48% per year over the first 10 years! (In contrast, the 2017 'Lower Peninsula' EWR potential study by GDS, in their "High Assumptions" scenario, found an average EWR potential of 2.13% per year over the first 10 years.)

I strongly recommend that the text for this bullet be revised to something like the suggested bullet I have added.

- Existing PURPA QFs greater than the utility's "must buy" obligation MW threshold are assumed to continue operations within the wholesale market beyond the termination date of the contract unless the QF indicates otherwise either publicly or directly to the utility.

Scenario #2 Sensitivities:

1. Fuel cost projections

Increase the natural gas fuel price projections from the base projections to at least the high EIA gas price in the most recent EIA Low Oil and Gas

Supply forecast natural gas fuel price projections at the end of the study period. [28]

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3. Ramp up the utility's EWR savings to at least 2.0%[30] of prior year sales over the course of four years, with EWR cost supply curves informed by the prior EWR potential studies conducted by Guidehouse and GDS, and augmented as necessary by additional research conducted in collaboration with stakeholders. EWR savings remain at 2% throughout the study period.

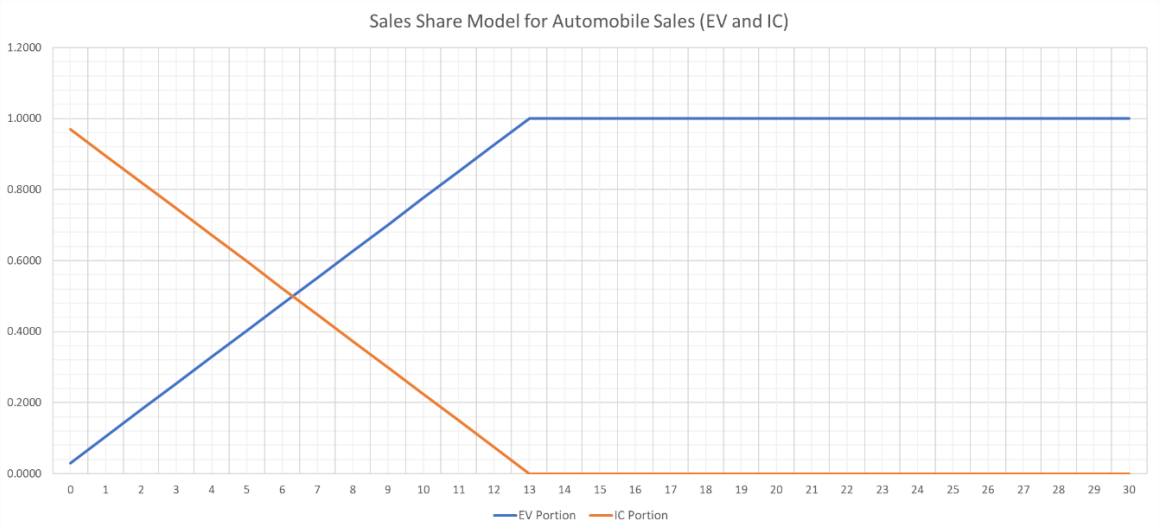
5 Lakes Energy comments on
3.23.22 Draft of MIRPP Scenario #2

5 Lakes Energy recommends that the EV projections in Scenario #2 be aligned with the Mi Healthy Climate Plan, which will be released soon. We anticipate that the core vehicle electrification recommendations of the MI Healthy Climate Plan will be that by 2035 100% of vehicle sales will be electric. In addition, a number of automakers (e.g. GM) have committed to fully electrify their vehicle offerings by 2035, which aligns with what climate models suggest will be necessary to meet a 2050 carbon neutrality target, given the average turn-over rate of new vehicles on the road.

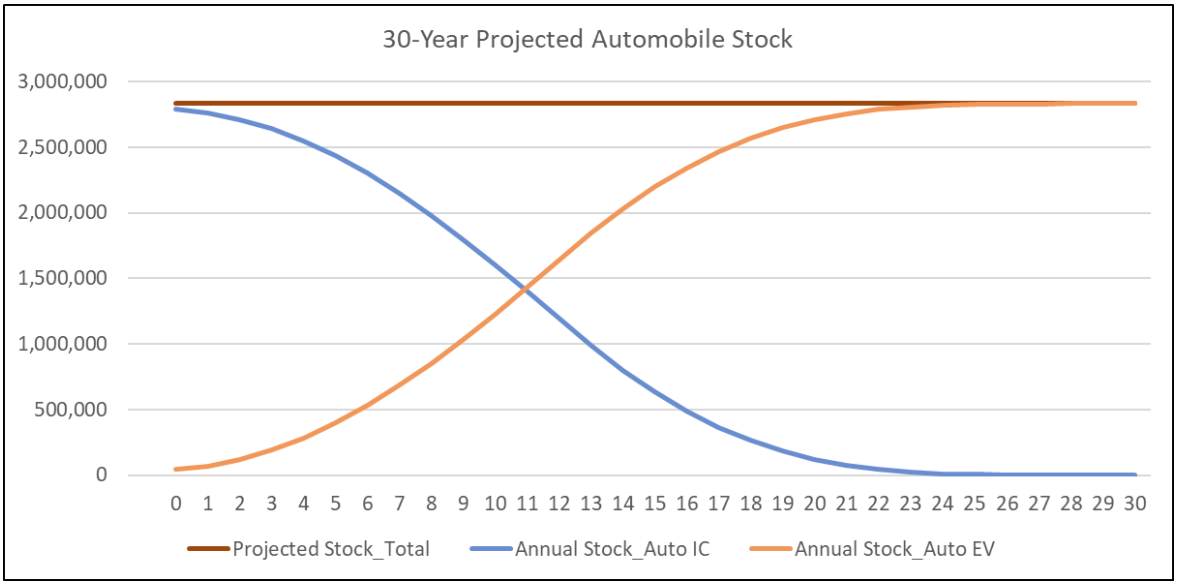
Although the particular path of EV sales as a percentage of all vehicle sales in Michigan is inherently uncertain, it is reasonable to assume that to meet 100% EV sales by 2035, auto manufacturers will not release any new non-EV models after about 2028, since it takes 6-7 years for a typical model to cover development and tooling costs and reasonable profit. Allowing 4-5 years for design and engineering, 100% electric sales by 2035 implies that almost all new model development will be electric within the next 2-3 years. If new models are released at about the same rate each year and sales volumes for each new model launch are about the same each year, this implies a linear increase in EV sales as a % of all vehicle sales from now until 2035.

Translation of EV sales to electricity sales requires that the EV sales path be translated from sales to operating fleet, operating fleet to vehicle miles traveled, and vehicle miles traveled to electricity consumption. 5 Lakes Energy has a spreadsheet model under development for this purpose, which will be finished by approximately June 1, 2022. The model is essentially complete for passenger automobiles but does not yet include other vehicle classes, including the light-duty trucks that are often used as passenger vehicles.

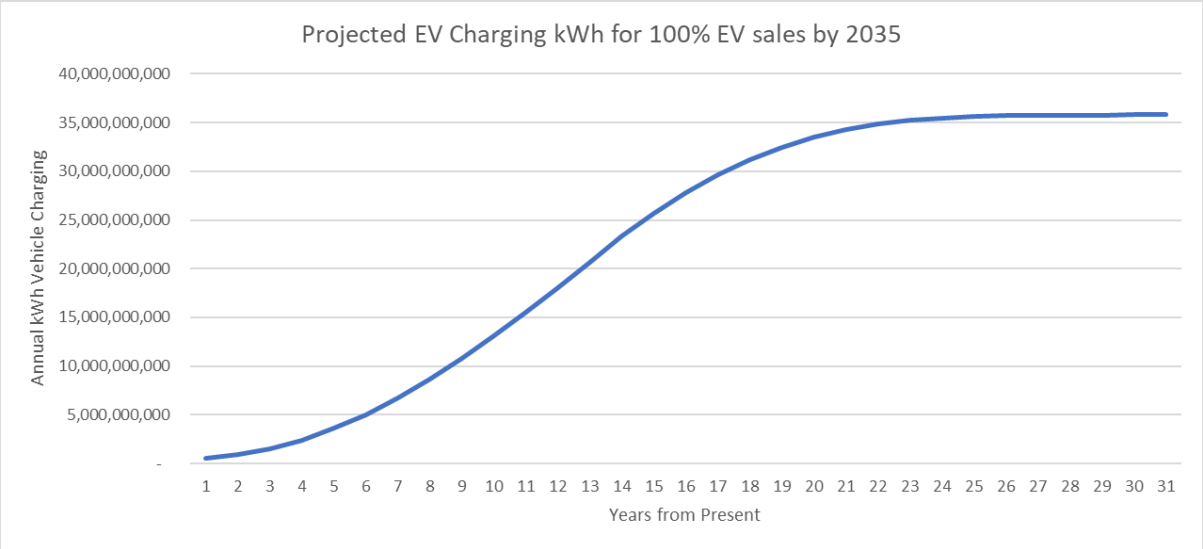
The statewide sales path for automobiles consistent with the MI Healthy Climate Plan is illustrated below:



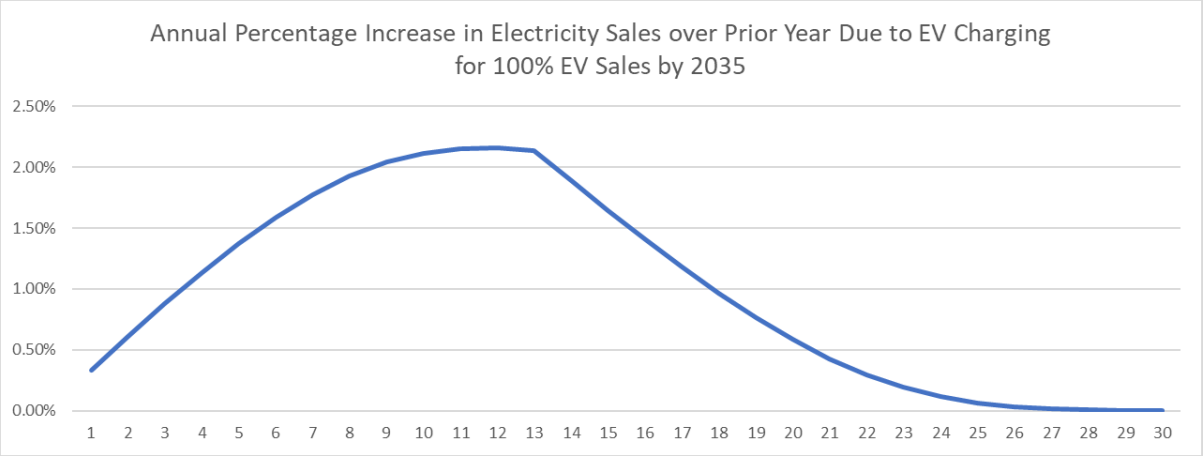
The resulting statewide automobile fleet composition is as follows:



Assuming that current fuel consumption shares by vehicle class persist, this leads to the following projection of statewide electricity consumption for vehicle charging, including all classes:



If we assume that non-EV sales of electricity will be essentially constant, consistent with recent history, the annual increase in statewide electricity sales attributable to growth in the EV fleet will be as shown below:



This illustrates that assuming a constant increase in the annual growth rate of electricity sales to account for EV charging is likely to be very misleading.

We therefore recommend that the specifications for MIRPP Scenario #2 assume a path for the share of vehicles sales that is electric and then develop an explicit electricity sales forecast for vehicle charging based on that path of sales share. For Scenario #2, a useful framing of sensitivities would be to consider different years to reach 100% EV share of vehicle sales. Although it is possible that there could be alternative pathways to 100% in any given year, numerical experiments suggest that any reasonable pathway produces a very similar projection of electricity sales.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

* * * * *

In the matter, on the Commission's own motion, to commence a collaborative to consider issues related to integrated resource and distribution plans.	))))	Case No. U-20633

COMMENTS OF THE
ASSOCIATION OF BUSINESSES ADVOCATING TARIFF EQUITY

I. INTRODUCTION

The Michigan Public Service Commission ("Commission") issued an Order on September 24, 2021 directing Commission Staff to begin Advanced Planning Phase III of the Integration of Resource, Distribution, and Transmission Planning workgroup. Specifically, this phase is to revisit the Michigan Integrated Resource Planning Parameters ("MIRPP"), integrated resource plan ("IRP") filing requirements, and Demand Response ("DR") and Energy Efficiency Studies which are required to be evaluated every five years under MCL 460.6t(1).

The Commission directed Staff to create a redline version of the MIRPP published on November 21, 2017, that reflects the recommendations developed through the Integration of Resource, Distribution, and Transmission Planning workgroup to date, as well as feedback from stakeholders and the directives for building a carbon-neutral Michigan pursuant to Executive Directive 2020-10. Pursuant to this direction Staff conducted a workgroup on March 24, 2022 and solicited feedback on certain questions and issues as set out below. Pursuant to that solicitation the Association of Businesses Advocating Tariff Equity ("ABATE") provides the following comments.

II. COMMENTS

1. Proposed language for Scenario #2.

ABATE generally accepts the language for Scenario #2, although if utilities must model significant electric vehicle ("EV") adoption the scenario should entail modeling some portion of this increased adoption as a distributed storage resource. In other words, the modeling should address if (and to what extent) EV batteries could feasibly and reasonably be used to provide excess power back to the grid or other services or benefits. As such, ABATE recommends and requests that a bullet point be added that states:

> "It should be assumed that the utility can sufficiently design rates that would incentivize some portion of the EV adoption to provide a distributed energy resource to the utility."

2. Utility approaches for incorporating the impacts of climate change in the IRP

ABATE has no feedback at this time.

III. CONCLUSION

Pursuant to Staff's solicitation of feedback ABATE recommends Staff consider and incorporate the comments set out above.

Respectfully submitted,

CLARK HILL PLC

By: */s/ Stephen A. Campbell*

Stephen A. Campbell (P76684)
Attorneys for Association of Businesses Advocating Tariff Equity
212 East César E. Chávez Avenue
Lansing, Michigan 48903
517-318-3100
scampbell@clarkhill.com

Date: April 4, 2022

Michigan Energy Innovation Business Council
115 W. Allegan, Suite 710
Lansing, MI 48933

Advanced Energy Economy
1010 Vermont Ave NW, Suite 1050
Washington, DC 20005

Dear Ms. Gibbs,

Advanced Energy Economy (AEE) and the Michigan Energy Innovation Business Council (Michigan EIBC) appreciate the opportunity to provide comments in response to the discussion in MI Power Grid's Advanced Planning Processes Phase III stakeholder meeting on Thursday, March 24, 2022. We have been active participants throughout many MI Power Grid workshops and have submitted comments throughout this workgroup. We look forward to further engaging with the Commission and Staff as Phase III of the Michigan Integrated Resource Planning Process (MIRPP) continues this spring.

We remain generally supportive of the overall updates Staff has made to the MIRPP and the filing requirements. Our comments below recognize that there continues to be uncertainty related to best practices for energy storage modeling and seek to provide guidance to Staff to support clarification. In addition, we commend Staff's commitment to ensuring that the planning parameters and filing requirements are aligned with state and utility goals. Furthermore, we ask that Staff consider the guidance issued in the draft MI Healthy Climate Plan and ensure that recommendations finalized in that process are integrated into utility planning processes.

If you have any further questions about these comments, please contact Ryan Katofsky and Laura Sherman.

Sincerely,

Laura Sherman
President
Michigan EIBC
Lansing, MI
laura@mieibc.org

Ryan Katofsky
Managing Director
Advanced Energy Economy
rkatofsky@aee.net

1. Background

The State of Michigan is undergoing a major transformation with respect to energy production and emissions reductions. The recent draft of the MI Healthy Climate Plan, produced by the Michigan Department of Energy, Great Lakes, and Environment's (EGLE) Office of Climate and Energy, proposed an overarching goal of requiring "100% clean, renewable electricity paired with robust energy storage" by 2050 "and applying the same level of ambition to other sources of GHG emissions".[1] The plan recognizes the historical and future significance of the state's current utility IRP process in supporting this transition by moving our electric utilities toward greater use of renewable energy and other clean energy technologies, including energy storage. Furthermore, the plan calls on the "MPSC to engage in broader system-wide energy planning for Michigan as a whole, while considering more distributed renewable resources and complementary technologies, like battery storage."[2]

It is imperative that the Commission recognize the goals and directives made throughout the MI Healthy Climate Plan, to ensure that utility planning processes are aligned with the state's goals. Given the fact that utility IRPs are a foundational piece of the state's scheme for emissions reduction, it is essential that the MPSC, utilities, and stakeholders ensure that the IRP process is prepared to support the state's energy transformation as soon as possible. Although the MIRPP and filing requirements are required to be updated every five years, it is critical that we act now, during the current revision, to enable the IRP process to meet the Governor's ambitious 2050 and interim year goals. As part of those goals, we expect major adoption of renewable energy resources. Achieving that level of clean energy deployment, while ensuring a reliable and cost-effective grid, will be impossible without substantial energy storage build-out – both utility-scale and behind-the-meter. More specifically, the recent *Energy Storage Roadmap for Michigan* produced by the Institute for Energy Innovation for EGLE found that, "based on current utility plans to retire fossil-fuel generation and deploy renewable energy, we estimate that at a

[1] Michigan Department of Environment, Great Lakes, and Energy. January 14, 2022. "Draft MI Healthy Climate Plan." Available at: https://www.michigan.gov/documents/egle/Draft-MI-Healthy-Climate-Plan_745872_7.pdf.
[2] *Ibid.*

minimum, Michigan will need to deploy 2,500 MW energy storage by 2030 and 4,000 MW by 2040 to ensure grid reliability and avoid curtailment of renewable energy generation."[3]

Michigan EIBC and AEE are encouraged by the progress that has taken place throughout the MI Power Grid Initiative, particularly in this workgroup. We remain encouraged by the inclusion of energy storage considerations in the current Staff drafts, yet we believe that additional refinement is needed. Our comments below identify a series of best practice recommendations for the modeling of energy storage in IRPs that build upon our original comments submitted on January 5, 2022.

2. *Energy Storage Provisions in Scenario #1 and #2*

> *Line Item: "Long and short duration storage resources are considered. Energy storage resources are modeled using available best practice methodologies to the extent that such guidelines exist. Allow for multiple market revenue streams where applicable."*

We continue to remain supportive of Staff's decision to require utilities to incorporate long- and short-duration storage resources in the IRP parameters. Storage is a unique grid asset that can provide power as both a distributed energy resource (DER) on either side of the meter and utility-scale asset, over different timescales, and provide a range of services. Long duration storage resources, capable of continuously discharging at full rated capacity for longer than eight hours, can provide firming services during extended low generation periods, while short duration storage resources meet critical needs during peak hours.

Due to its inherent benefits and declining costs, energy storage deployment is increasing across the country. For Michigan to be ready for the advanced energy future, policymakers need to set the stage by deploying energy storage now to ensure the state has the energy storage deployed that it will need in the coming years to ensure a reliable, resilient, and cost-effective electric grid for the future. Accurately and appropriately valuing storage in utility IRP's presents one major opportunity to facilitate Michigan's advanced energy future. It is imperative that the final

[3] Institute for Energy Innovation for Michigan Department of Environment, Great Lakes, and Energy. March 2022. "Energy Storage Roadmap for Michigan." Available at: https://mieibc.org/wp-content/uploads/2022/03/IEI_EnergyStorageReport_FINAL.pdf.

planning parameters and filing requirements established by this workgroup require utility IRPs to include an accurate evaluation of all opportunities for existing and emerging storage resources and, at a minimum, meet any established storage target, if one is established by the Legislature, Governor, or MPSC.

Michigan EIBC and AEE believe that the energy storage language reflected in the current draft is a necessary inclusion and brings the IRP process closer to an improved process for storage modeling. We understand that there is some uncertainty from Staff, as well as the utilities and other stakeholders, as to what extent best practices for storage modeling exist. Our previous comments, submitted on January 5, 2022, reflect some recommendations in this regard. Below we reflect upon those recommendations and provide some additional insights.

There are a variety of ways storage can be considered as part of IRP planning processes. In 2018, the National Association of Regulatory Utility Commissioners passed a resolution on modeling energy storage. The resolution recommended a number of principles to guide NARUC member states in modeling energy storage and other flexible resources, including using tools to model the "full spectrum of services that energy storage and flexible resources are capable of providing, including subhourly services."[4] Some states, including California, Oregon, and Virginia require regulated utilities to procure energy storage.[5, 6] Other states encourage or require utilities to consider storage assets in the IRP process. For example, under Washington law, an IRP "must assess other distributed energy resources that may be installed by the utility or the utility's customers including, but not limited to, energy storage, electric vehicles, and photovoltaics. Any such assessment must include the effect of distributed energy resources on the utility's load and operations."[7] In 2017, the Washington Utility and Transportation Commission (UTC) issued an Energy Storage Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition that provided guidance for "how utilities should

[4] National Association of Regulatory Utility Commissioners. November 2018. "EL-4/ERE-1 Resolution on Modeling Energy Storage and Other Flexible Resources." Available at: https://pubs.naruc.org/pub/2BC7B6ED-C11C-31C9-21FC-EAF8B38A6EBF.
[5] Stanfield, S., Petra, J. S., and Auck, S. B. Interstate Renewable Energy Council. April 2017. "Charging Ahead: An Energy Storage Guide for State Policymakers." Available at: https://irecusa.org/resources/charging-ahead-energy-storage-guide-for-policymakers/.
[6] Burwen, J. Energy Storage Association. 2020. "Energy Storage Goals, Targets, Mandates: What's the Difference?" Available at: https://energystorage.org/energy-storage-goals-targets-and-mandates-whats-the-difference/.
[7] Washington Administrative Code 480-100-620. Available at: https://app.leg.wa.gov/WAC/default.aspx?cite=480-100-620.

model energy storage within the traditional construct of hourly IRP models."[8] In Oregon, Portland General Electric's 2016 IRP determined under what use cases the value of storage to the utility's system would exceed the cost of a battery system in 2021.[9] In Arizona, Arizona Public Service Company's IRP reflects a demand-side management plan that includes behind the meter batteries on targeted distribution feeders.[10]

When considering storage in an IRP context, a utility must be fully able to assess the value of storage to the grid, the utility, and ratepayers, including by utilizing sub-hourly and 8760 modeling. If accurate modeling of energy storage resources is not possible given model limitations, storage benefits can be incorporated into IRPs using a net-cost-of-capacity approach.[11, 12] Under this method, operational benefits of storage that are difficult to represent accurately within the IRP model (e.g., the value of real-time energy arbitrage or ancillary services) can be estimated using a separate analysis outside the IRP model and credited to storage within the IRP model as a reduction in the installed cost of storage. In expert witness testimony provided in response to Consumers Energy's current application for approval of an Integrated Resource Plan (Case No. U-21090), Michigan EIBC witness Ed Burgess described several flaws with Consumers' modeling of energy storage, including the lack of sub-hourly dispatch and overly restrictive assumptions on market participation. Mr. Burgess notes that "Stategen has conducted analyses showing that this real-time dispatch has the potential to increase the value of a storage system in some cases by up to approximately 80%."[13]

Other best practices for storage modeling in IRP processes have been identified by researchers at the Lawrence Berkeley National Laboratory (LBNL) and Pacific Northwest National Laboratory (PNNL). A recent paper, "State of the Art Practices for Modeling Storage in Integrated Resource

[8] Washington State Utilities and Transportation Commission. October 2017. "Report and Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition." Dockets UE-151069 and U-161024 (Consolidated). Available at: https://apiproxy.utc.wa.gov/cases/GetDocument?docID=237&year=2016&docketNumber=161024.
[9] *Ibid.*
[10] Arizona Public Service Company. 2020 Integrated Resource Plan. Available at: https://www.aps.com/-/media/APS/APSCOM-PDFs/About/Our-Company/Doing-business-with-us/Resource-Planning-and-Management/2020IntegratedResourcePlan062620.ashx?la=en&hash=24B8E082028B6DD7338D1E8DA41A1563. pp. 22, 66-67.
[11] Energy Storage Association. 2018. "Advanced Energy Storage in Integrated Resource Planning." Available at: https://energystorage.org/wp/wp-content/uploads/2019/09/esa_irp_primer_2018_final.pdf.
[12] Cooke, A. L., Twitchell, J. B., O'Neil, R. S. Pacific Northwest National Laboratory. May 2019. "Energy Storage in Integrated Resource Plans." Available at: https://energystorage.pnnl.gov/pdf/PNNL-28627.pdf.
[13] Direct Testimony of Ed Burgess on Behalf of the Michigan Energy Innovation Business Council, Institute for Energy Innovation, and Clean Grid Alliance. Case No. U-21090. Available at https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000ViZ2QAAV. p. 234.

Planning," recognizes that the flexibility and scalability benefits of energy storage are continuously undervalued in the models that utilities currently use.[14] The authors argue that "more accurate inputs (e.g., up to date costs and forecasts) and improved modeling methods (e.g., assessing benefits for a wider range of grid services, incorporating behind-the-meter (BTM) applications) are needed to better integrate storage into planning processes."[15] LBNL and PNNL have devoted a significant amount of attention to developing best practices for modeling energy storage in IRPs. Michigan EIBC and AEE recommend that Staff utilize this work to clarify the best practices that utilities are expected to adhere to. We are concerned that without direct guidance from Staff, the current language, which reads "to the extent that such guidelines exist," may be used to argue that guidelines do not exist and therefore that modeling of energy storage does not have to be undertaken.

With the above analyses in mind, Michigan EIBC and AEE make the following recommendations to improve energy storage considerations in the IRP planning parameters and to ensure that best practices are understood clearly.

1. Change**:** *Long and short duration storage resources are considered. Energy storage resources,* ***both behind and in front of the meter****, are modeled using available best practice methodologies* ~~***to the extent that such guidelines exist***~~ ***[Add best practices developed by MPSC Staff with support from technical assistance including those listed below].*** *Allow for multiple market revenue streams* ~~***where applicable***~~*.*
    a. *Best practices include:*
        i. *Those as identified in Lawrence Berkeley National Laboratory's "State of the Art Practices for Modeling Storage in Integrated Resource Planning."*
        ii. *Utilize hourly and sub-hourly modeling to appropriately represent energy storage dispatch.*
        iii. *Ensure that IRP scenarios account for atypical weather conditions that occur at least as frequently as once in ten years. This modeling should*

[14] Miller, C., Twitchell, J. and Schwartz, L. October 12, 2021. "State of the Art Practices for Modeling Storage in Integrated Resource Planning." Innovations in Electricity Modeling: Training for National Council on Electricity Policy. Available at: https://pubs.naruc.org/pub/CCBEFC58-1866-DAAC-99FB-3A405315FB9B.
[15] *Ibid*.

also consider both accurate energy arbitrage values as well as ancillary service values.

iv. *If accurate modeling of storage is not possible given current model limitations, storage benefits can be incorporated into IRPs using a net-cost-of-capacity approach.*[16]

v. *If the Governor or the Legislature establishes a state energy storage target, the Commission should require utility IRPs to include any established energy storage targets as a baseline and accurately model all qualified energy storage resources.*

[16] Cooke, A. L., Twitchell, J. B., O'Neil, R. S. Pacific Northwest National Laboratory. May 2019. "Energy Storage in Integrated Resource Plans." Available at: https://energystorage.pnnl.gov/pdf/PNNL-28627.pdf.

Ecology Center comments and recommended edits:

3.23.22 Draft of MIRPP Scenario #2

Overall comment: The Ecology Center disagrees with the Staff recommendation for Scenario #2 to rely on EIA AEO EV projections, with a factor of 5 for EV adoption rates. Even with the proposed factor of 5 adjustment, we believe these projections are out-of-step with respected industry forecasts, auto industry commitments, and Michigan's climate neutrality goals. We instead recommend that adoption rates be used that result in EVs achieving 50% of light duty vehicle sales in 2030, and 100% of sales in 2035. In addition, sensitivities should be added that explore both higher and lower levels of EV adoption.

Background: Most major automakers have joined with the Biden administration in setting goals for at least 50% of their light-duty vehicle sales be EV by 2030. This goal is supported in the draft of the MI Healthy Climate Plan, which is expected to be finalized on April 22. In addition, a number of automakers (e.g. GM[1]) have committed to fully electrify their U.S. vehicle line-ups by 2035. This date aligns with what climate models suggest will be necessary to meet a 2050 carbon neutrality target, given the average 10-15 year turn-over rate of new vehicles on the road.

We would further recommend that a sensitivity be added that explores a higher level of EV adoption. This is supported by recommendations in the MI Healthy Climate Plan, as well as most recent Council on Future Mobility and Electrification report, which urge the state to prepare for as many as 2 million EVs on Michigan roads by 2030. Our analysis suggests this would require 80% to 90% EV sales to be achieved by that date. While this may seem to some as unlikely, note that several automakers have already pledged 100% EV line-ups in Europe by 2030 (e.g. Ford[2]), with auto brands Volvo, Chrysler and Maserati announcing all-electric U.S. line-ups by 2028 and 2030. In addition, EV purchase price parity with conventional gasoline vehicles is expected to be achieved as early as 2025, creating a "tipping point" in EV sales that many predict would further accelerate the transition to EVs. As one illustration of this phenomenon, in Norway where EV purchase incentives have been more generous than in the US, EVs now exceed 80% of new car sales.

Recent sales trends in the U.S. and Michigan further support a rapid EV transition scenario. In the last two years, EV sales have grown by more than 150% each year in Michigan, even with limited product availability. In the next

[1] https://www.washingtonpost.com/climate-environment/2021/01/28/general-motors-electric/
[2] https://corporate.ford.com/articles/sustainability/ford-europe-goes-all-in-on-evs.html

few years, dozens of new EV models will be launched in many popular vehicle segments, including cross-overs, SUV's and pick-ups[3] like the new F-150 Lightening which has already "sold-out" in new orders until additional production capability can be ramped up. While a 150% growth rate may not be sustainable through the rest of this decade, even a significantly lower 50% growth rate would achieve sales of 85% EVs by 2030 based on Ecology Center analysis.

Suggested revisions/edits:

This scenario assumes significant advancements toward electrification that drives a total energy and demand growth rates to 1.71% and 1.41% respectively. Emissions decline, driven by state goals and utility plans throughout the MISO footprint, creating at least an 80% carbon reduction by 2040 from the baseline year of 2025 for the MISO region. Assume similar reductions from PJM. This trajectory of carbon reduction is expected to continue beyond 2040. Utilities should use ~~the most recent EIA AEO East North Central Census Region Reference Case[4] for forecasted~~ EV adoption rates ~~with a multiplier of 5~~that achieve 50% of light duty sales by 2030 and 100% sales by 2035, in alignment with state and federal climate goals and auto industry commitments. ~~to illustrate significant advancements in EV adoption~~ Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand.

- Natural gas prices utilized are consistent with Reference Case projections from the United States Energy Information Administration's (EIA) most recent annual Energy Outlook.
- Current demand side resources and utility distributed generation programs remain in place and additional growth in those programs would happen if they were economically selected by the model to help comply with the specified carbon reductions in this scenario.
- EV adoption and customer electrification adoption cause adjustments in overall load profiles throughout the planning horizon.

  Non-nuclear, non-coal generators will be retired in the year the age limit is reached and driven by announced retirements. Coal units will primarily be retired based upon carbon emissions and secondarily based upon economics. Nuclear units are assumed to have license renewals granted and remain online.

[3] https://www.consumerreports.org/hybrids-evs/hot-new-electric-cars-are-coming-soon-a1000197429/

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

- Utilities should use that achieve 50% of light duty sales by 2030 and 100% sales by 2035, in alignment with state and federal climate goals and auto industry commitments. ~~to illustrate significant advancements in EV adopti~~. Using this information, utilities may develop their own demand and energy forecasts with description and detail how their forecast has included the impacts of climate change[5], electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand.
- Specific new units are modeled if under construction or with regulatory approval (i.e., IRP cost pre-approval, CON, or signed GIA).
- Not less than 35% of the state's electric needs should be met through a combination of EWR and renewable energy by 2025, as per MCL 460.1001 (3).
- The utility can illustrate how the plan is expected to meet state goals for greenhouse gas emissions specific to the power industry sector.
- Existing renewable energy production and storage tax credits and renewable energy investment tax credits continue pursuant to current law. Federal policy timing may impact modeling.
- Long and short duration storage resources are considered. Energy storage resources are modeled using available best practice methodologies to the extent that such guidelines exist. Allow for multiple market revenue streams where applicable.
- Technology costs for wind, solar, storage and other renewables decline with commercial experience and forecasted at levels 30% reduction from scenario 1 by the end of the study period.
- Non-carbon dioxide emitting resources will be increased, due to the constraint on allowable carbon emissions in the model.
- Technology costs and limits to the total resource amount available for EWR and demand response programs will be determined by the~~ir~~ respective state-wide potential study.
- Existing PURPA contracts are assumed to be renewed. Existing PURPA QFs up to the utility's "must buy" obligation MW threshold are assumed to be renewed unless the QF indicates otherwise either publicly or directly to the utility.
- Existing PURPA QFs greater than the utility's "must buy" obligation MW threshold are assumed to continue operations within the wholesale market beyond the termination date of the contract unless the QF indicates otherwise either publicly or directly to the utility.

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

Scenario #2 Sensitivities:

1. Fuel cost projections

Increase the natural gas fuel price projections from the base projections to at least the high EIA gas price in the most recent EIA Low Oil and Gas

Supply forecast natural gas fuel price projections at the end of the study period. [28]

2. 80% carbon reduction in the utility's service territory, modeled as a hard cap on the amount of carbon emissions, by 2030 as a sensitivity.[29]

3. Ramp up the utility's EWR savings to at least 2.0%[30] of prior year sales over the course of four years, using EWR cost supply curves provided in the 2021 supplemental potential study for more aggressive potential.[31] EWR savings remain at 2% throughout the study period.

4. Ramp up the EV forecast to include at least 85% sales of EVs by 2030.