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Making the Most of Michigan's Energy Future

MIRPP & Filing Requirements

Advanced Planning Stakeholder Meeting

March 24th, 2022

MPSC

Michigan Public Service Commission

Workgroup Instructions

1. This meeting is being recorded.
2. Please be sure to mute your lines.
3. There will be opportunities for discussion throughout each presentation. Please use the raised hand function and the presenter will call on you when it is your turn to speak or type your comment in the chat.
4. Please be respectful and courteous when others are speaking.
5. We will be requesting comments after all meetings. All comments will be posted to the webpage.
6. The presentations for all meetings are posted to the Advanced Planning webpage.
7. If you are having technical difficulty, please contact Merideth Hadala at Hadalam@michigan.gov.

Phase III Stakeholder Meetings

- Meeting #1 December 16th
  - Initial Staff Drafts, Review Potential Study Results, Solicit Feedback
- Meeting #2 January 31st
  - Review Stakeholder Feedback Highlights on MIRPP and Filing Requirements, Base Case Scenario Stakeholder Discussion, Climate Change Stakeholder Discussion.
- Meeting #3 February 28th
  - Review Environmental Rules/Laws in MIRPP, Review Environmental Considerations in Filing Requirements, Demo EJ Tool, Electrification and Decarbonization Scenario Discussion including Carbon Counting.
- Meeting #4 March 24th
  - Climate Change in Modeling
  - Scenario #1 and #2 Discussion
- Meeting #5 April 26th
  - Review Refined Drafts with Stakeholders and Solicit final Feedback Due in May.

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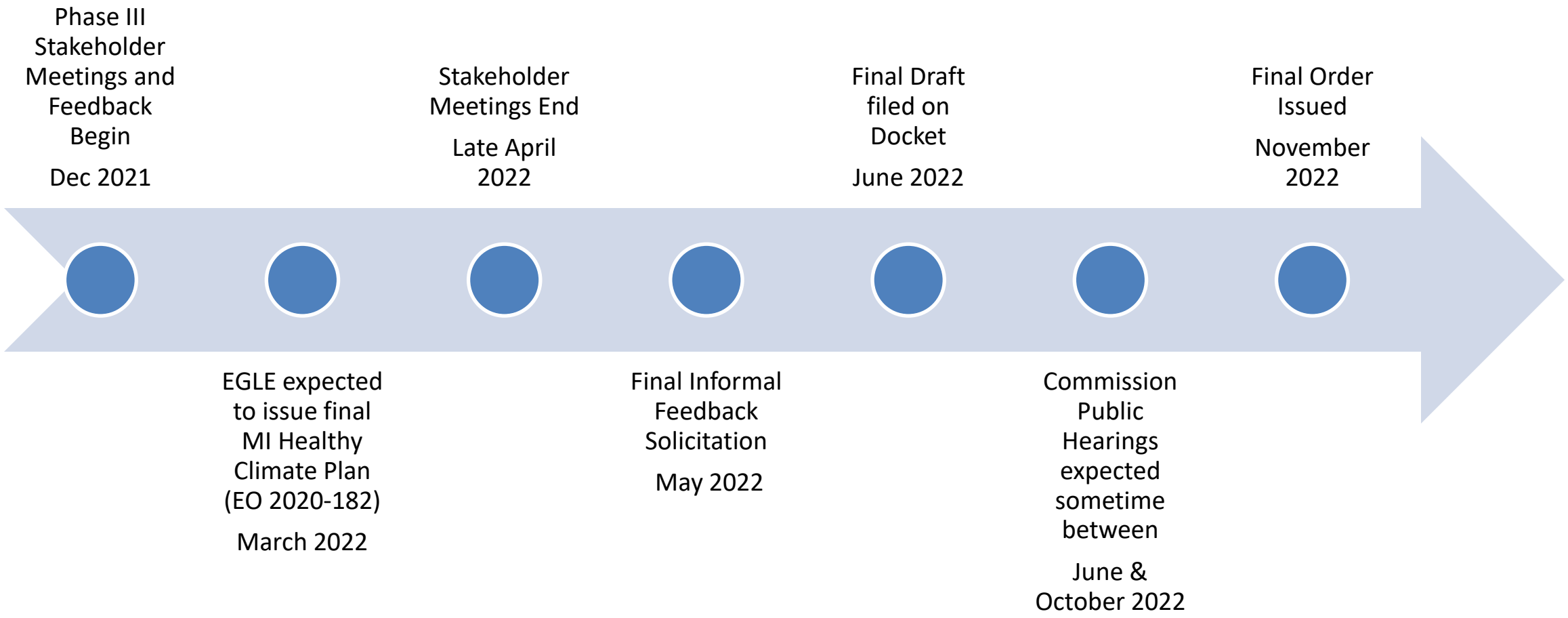
Agenda Items		
9:00 a.m.	Introduction	Naomi Simpson (MPSC)
9:15 a.m.	Climate Change Discussion	Michael & Paul Soni (CE) Markus Leuker (DTE) Chad Burnett (I&M)
10:20 a.m.	Break	
10:30 a.m.	Scenario #2 Changes & Discussion	Megan Kolioupoulos (MPSC)
11:10 a.m.	Break	
11:20 a.m.	Scenario #1 Changes & Discussion	Karsten Szajner (MPSC)
12:00 p.m.	Questions & Closing	Naomi Simpson (MPSC)
12:15 p.m.	Adjourn	

Phase III Timeline



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Making the Most of Michigan's Energy Future

Paul Soni
(CE)

Michael Soni
(CE)

Markus Leuker
(DTE)

Chad Burnett
(I&M)

Climate Change Discussion

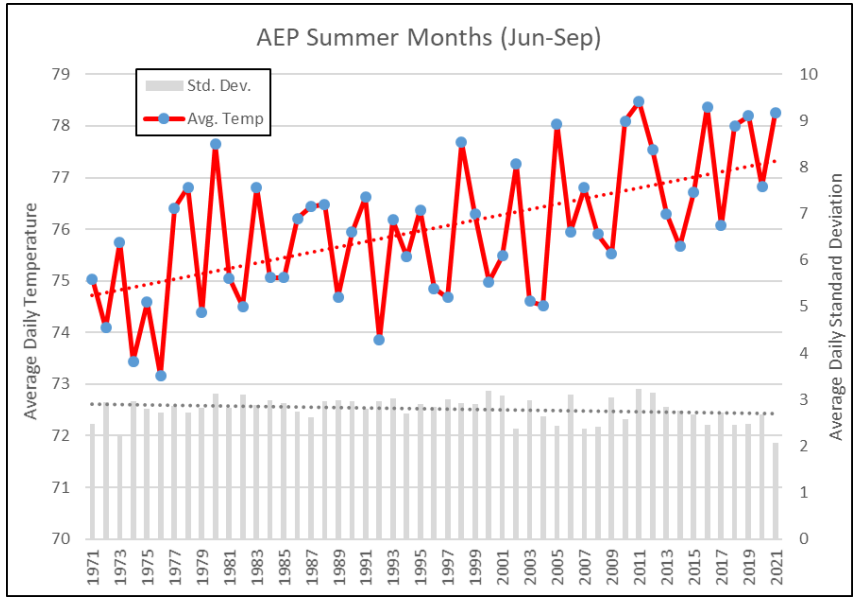
MPSC
Michigan Public Service Commission

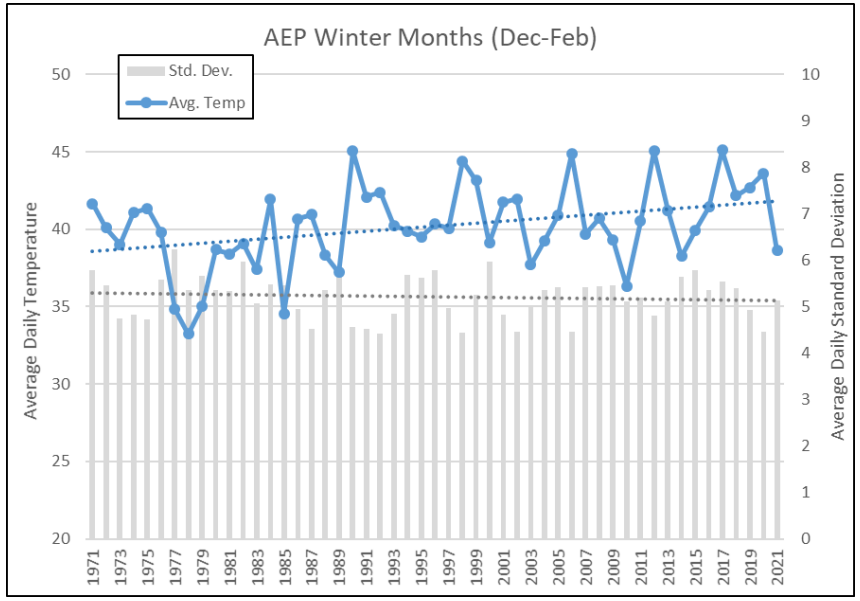
Weather Trends and Impacts on Modeling

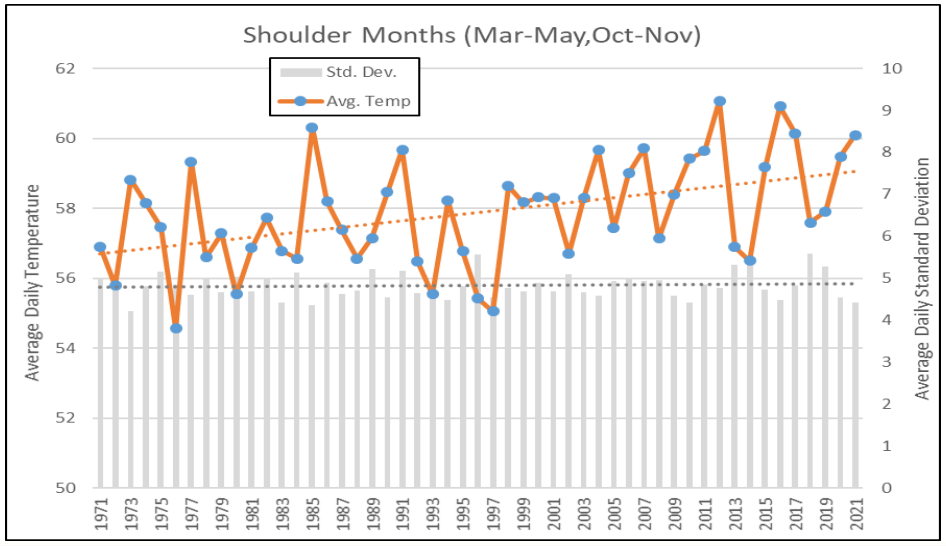
Chad Burnett, AEP

Are Temperatures Becoming More Volatile?

- There has been a gradual warming trend in temperatures across the AEP service territory.
- However, temperatures are not necessarily becoming more volatile over time.

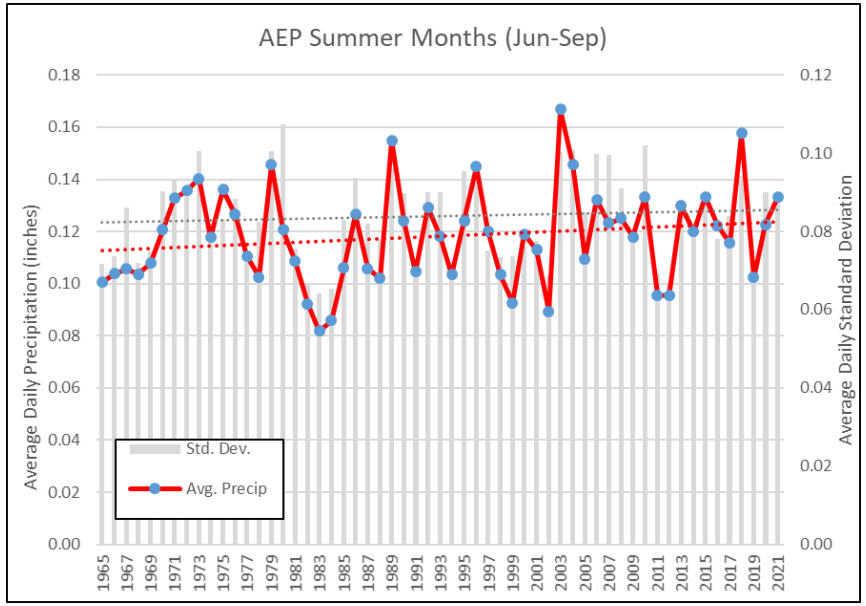


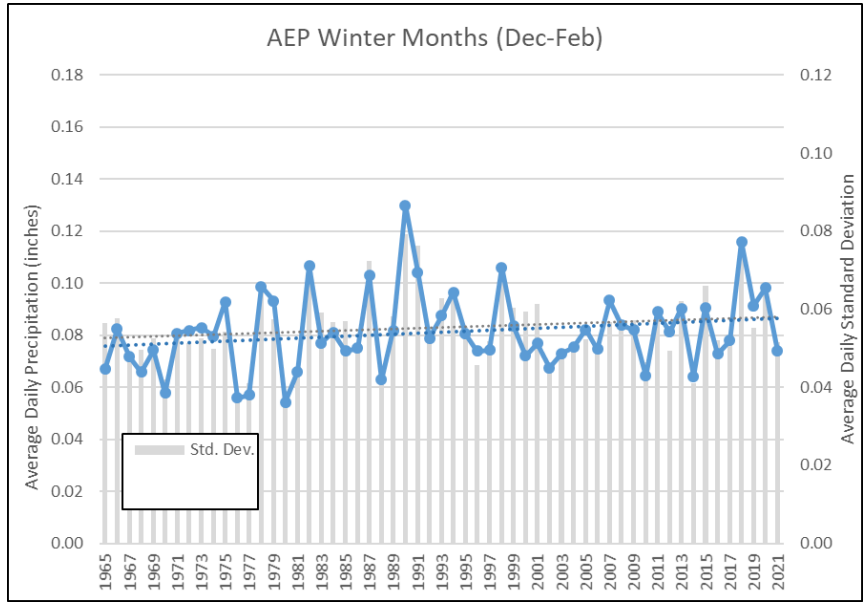


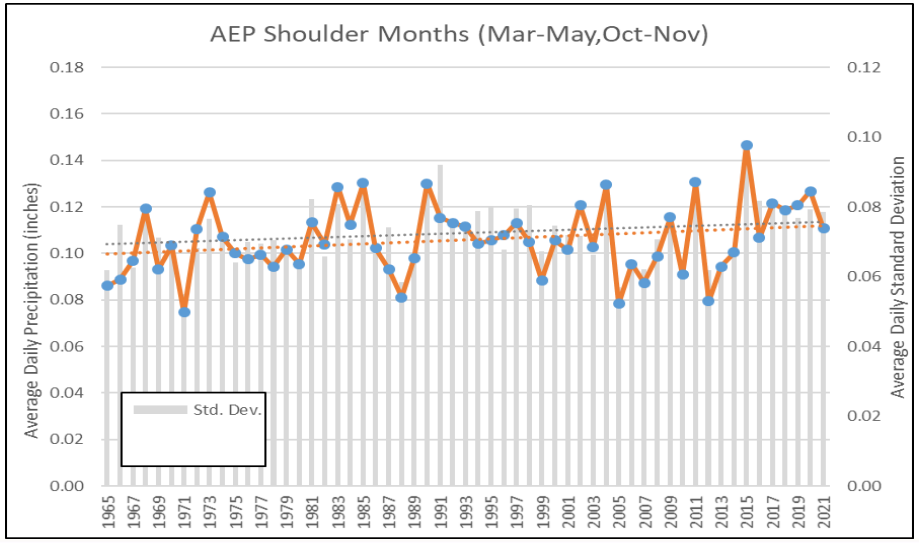


Is Precipitation Becoming More Volatile?

- AEP's service territory gets the most precipitation during the summer and shoulder seasons.
- Overall, the AEP service territory does show a gradual increasing trend in precipitation (e.g. we are getting wetter).
- Furthermore, the precipitation data is becoming slightly more volatile over time.

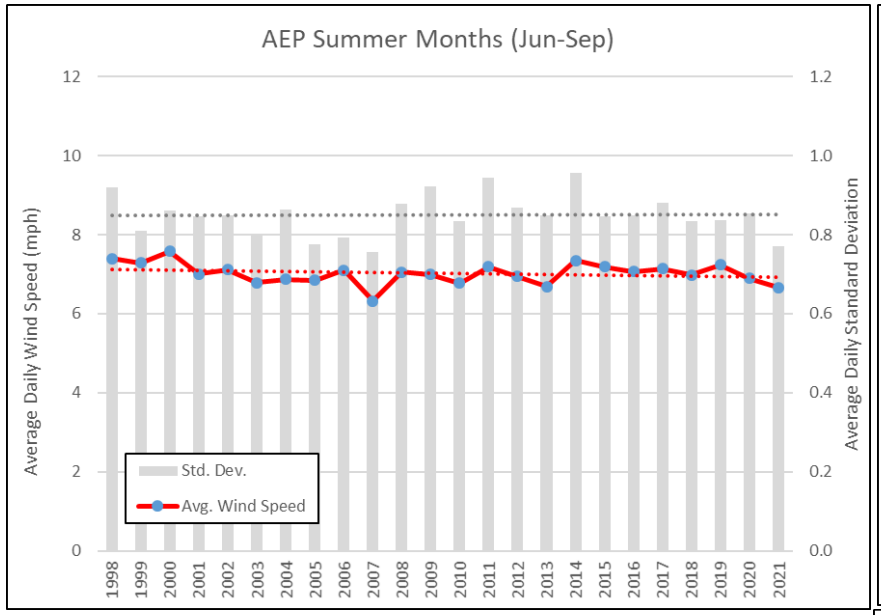


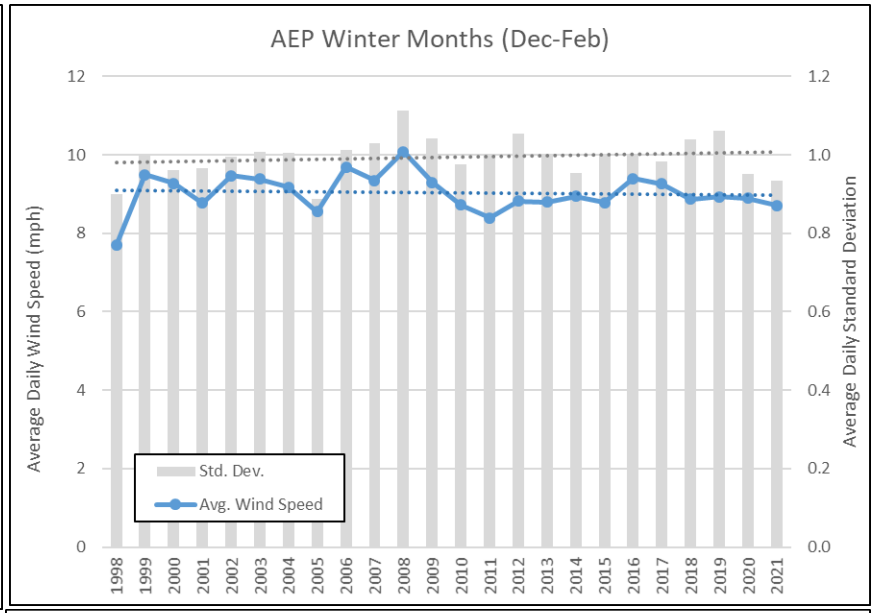




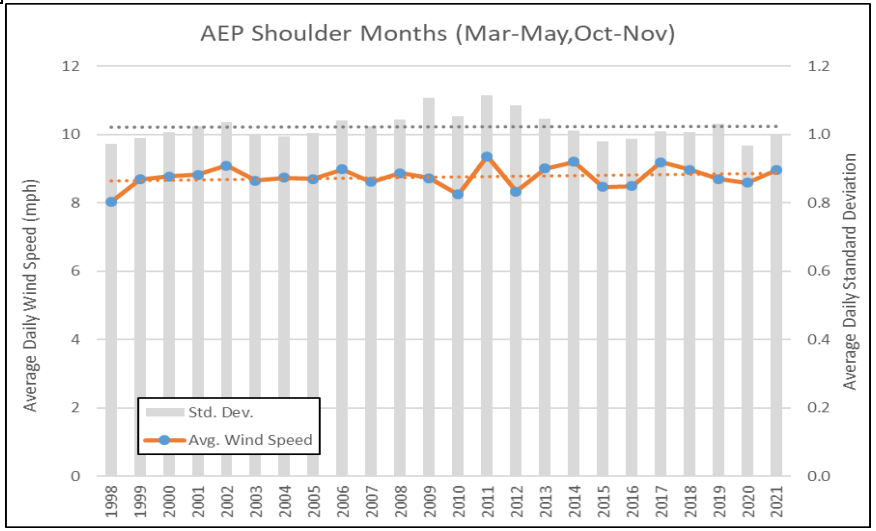
Is Wind Becoming More Volatile?

- The NOAA weather stations used for AEP's weather normalization did not have as much historical data on wind speed, especially in the west. As a result, this part of the study was more compressed.
- Wind speeds are typically higher in the winter and shoulder months than the summer.
- The trend suggests wind speeds during the summer and winter months are slowing down, while wind speeds in shoulder months have increased.





- However, wind speed volatility shows a slight increasing trend meaning we are seeing more volatility in wind speeds over time for all seasons.



Modeling Weather Scenarios

Possible approaches to address Climate Change and Extreme Weather in an IRP

Markus Leuker, DTE

DTE believes the following approaches to incorporate Extreme Weather Conditions and Climate Change into IRP modeling are appropriate and suggests leaving requirements non-prescriptive

- Utilities and industry groups are starting to consider and study extreme weather and climate change
  - We were involved with an EPRI supplemental project that explored climate impacts in utility operations and planning
  - We anticipate that many more studies will be done in the next few years and the industry will move toward incorporating climate change and/or extreme weather uncertainty into IRPs

- Before the next round of IRPs, we plan to determine the best way to stochastically model climate change affected variables (correlated weather, renewable generation, thermal unit RORs)
  - We will consider stochastic risk analysis using Aurora as well as EnCompass

- Weather sensitivity approaches incorporated into load forecasting models to address extreme weather conditions and climate change are addressed in the following pages

- Handling extreme weather and climate change with both stochastic risk assessment and load forecast sensitivities can be duplicative

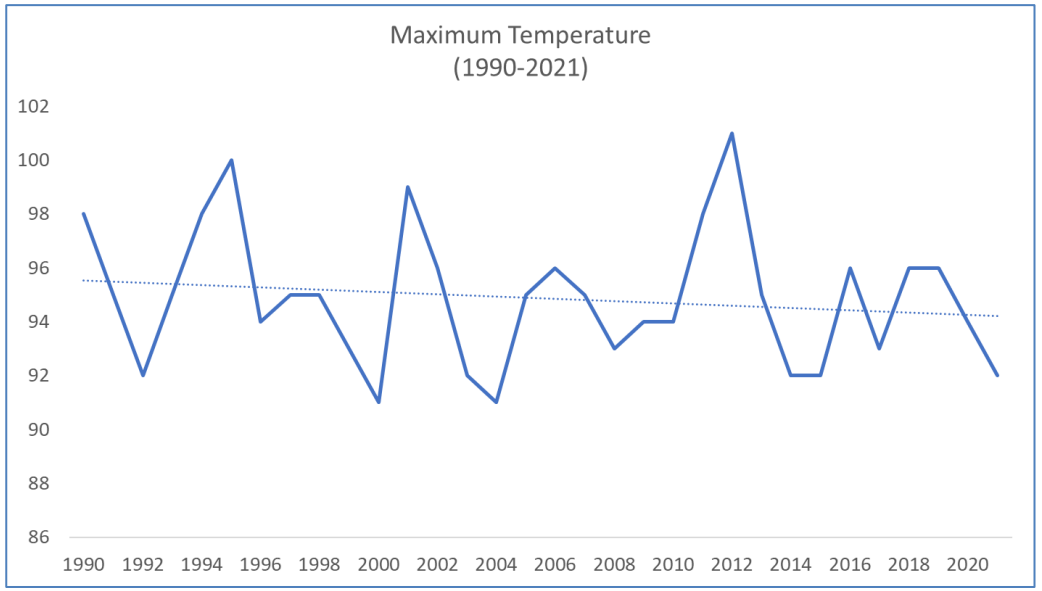
- DTE recommends leaving this requirement as non-prescriptive and allowing each utility to determine how to address climate change and extreme weather in an IRP recognizing that each utility uses different models and processes for both load forecasting and IRP risk assessment

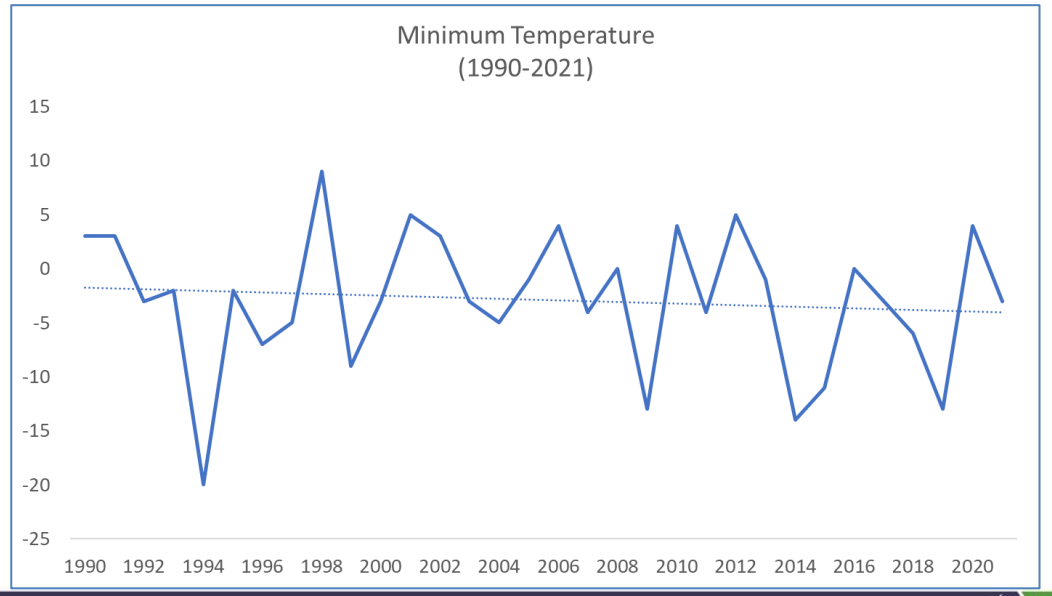
Modeling Weather Uncertainty (Extreme Weather Conditions)

- Load Forecast uncertainty due to weather may be captured by generating alternative sensitivity forecasts, based on alternative weather sensitivities
- DTE Energy uses a rolling 15-year calculation range to compute normal weather
  - Each year within this range defines a weather scenario which may be extended over the forecast period
  - For example, the 2007 weather inputs are repeated in each year of the forecast horizon, creating the 2007 weather sensitivity. This process is repeated for each historical year, resulting in the creation of 15 forecasted weather scenarios
- Each forecasted weather scenario is simulated through the load forecast models, generating alternative load forecasts and a distribution of forecast scenarios
- From these multiple weather years, we can issue load forecasts based on a series of confidence bands (90/10, 70/30, etc..)
- These sensitivities are meant to account for uncertainty and contingencies related to extreme weather
- Limitation: These forecast sensitivities are based on historical record, which limits its application of future incidents of extreme weather

Modeling Climate Change

- Define the annual impact of Climate Change on core weather concepts based on historical trends (e.g. 0.1 degree increase per year):
  - Cooling Degree Days (CDDs) and Heating Degree Days (HDDs)
  - Max, Avg, Min Temperature
- Trend the normal weather inputs based on their respective annual impacts
- Generate a load forecast based on the trended normal weather inputs
- Assess the delta between the base forecast and the trended normal forecast
- Careful consideration should be made based on historical data
  - DTE data shows (last 30 years):
    - Average Temperature has risen while Coldest Day and Hottest Day have fallen





Modeling Weather Scenarios

Climate Change & Stochastics in IRP Modeling

Paul Soni, Consumers Energy
Michael Soni, Consumers Energy

Climate Change & Stochastics in IRP Modeling

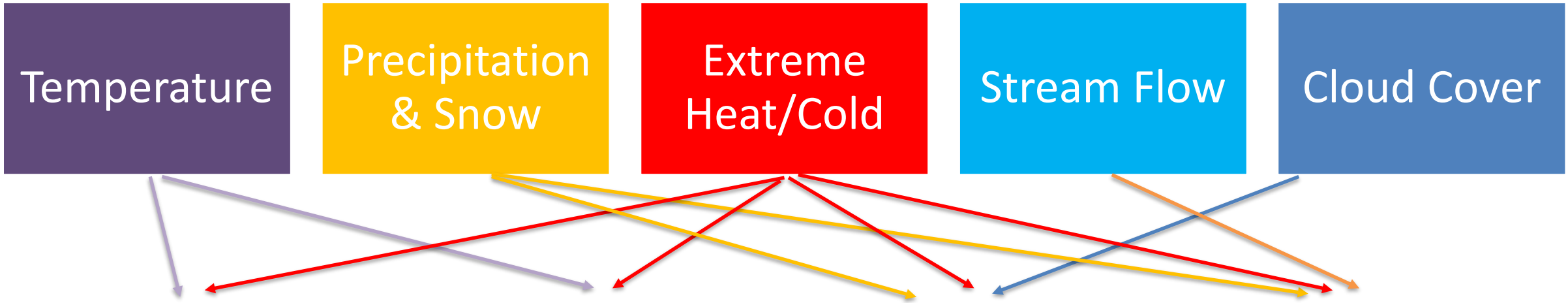
- Extreme weather events are becoming more common
  - Climate change impacts can include extreme heat and cold, precipitation, snow, cloud cover, wind, and stream flow

- Stochastic risk analysis in modeling allows for variation of individual or multiple inputs to quantify effects on utility system costs & reliability

- Weather is **not** a direct model input
  - Must determine which variables would be **impacted** by climate change and apply stochastic analysis to **identify a proxy for potential risk**

Stochastic Risk Analysis – Variables Evaluated

Consumers Energy
Count on Us®



Load	Variable Costs	Unit Availability	Transmission Impacts
• Peak forecast • Energy forecast • Hourly Load	• Natural gas/fuel prices • CO2 price • VOM resource costs	• Availability during peak periods • Renewable profile volatility	• Line outages • Capacity derates

Stochastic Modeling Considerations & Limitations

- Run time and computational considerations
  - 1,000 runs x 8 hours each = **8,000 hours of run time!**
- Data management
  - Reporting granular output means extremely large amounts of data reporting
  - 500 generating units x 20 years x 8760 hours x 1,000 runs = **87,600,000,000 records of data**
- Options to evaluate impacts of individual variable or evaluate in correlation
- Correlation complexity
  - 80% correlation in Aurora means variables will move in the same direction 80% of the time
  - Degrees of freedom get further and further with increased number of variables

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Break

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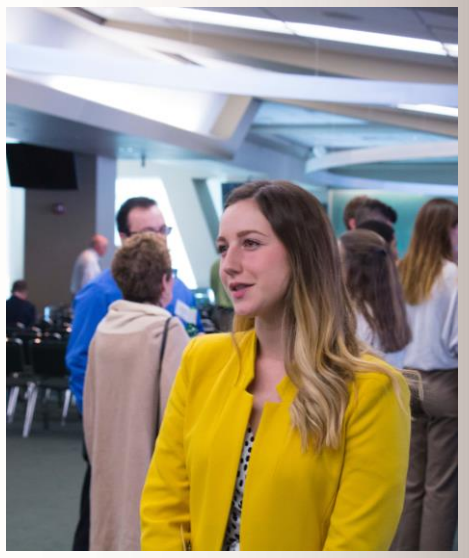
Scenario #2 Changes & Discussion



Megan Kolioupoulos

Review of Scenario #2

- Built using MISO Future 3 as a starting point. This scenario reflects 100% achievement of state and utility announcements.
- This scenario requires a minimum penetration of wind and solar across the MISO region consistent with the most recent MISO Future 3.
- Energy purchases are modeled at a carbon intensity consistent with the MISO system average.
- Electrification drives a total energy growth by 2040 that is consistent with the most recent MISO Future 3. Utility load profiles and peak demand are adjusted to reflect the increased EV and electrification.

Changes to Scenario #2

- "~~This scenario requires a minimum penetration of wind and solar…~~"

- We weren't clear how "requires a minimum penetration of wind and solar across the MISO region consistent with MISO Futures 3" would be applied. Does this just apply to the mix of resources needed in the representation of MISO or Zone 7? Or does this dictate the utilities' own system mix as well? – *Union of Concerned Scientists*

- **"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."**

Changes to Scenario #2

- "Electrification drives a total energy growth by 2040 that is consistent with the most recent MISO Future 3. Utility load profiles and peak demand are adjusted to reflect the increased EV and electrification."

  - This is an extremely aggressive assumption. It's unclear what the basis is used to determine the amounts assumed in this case and how those would be allocated to each utility's service territory. What is the intent of using this assumption in the scenario? *–DTE*
    - *Staff response: Based on MISO Future 3. Establishes a bookend for what electrification may look like.*

- **"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 for forecasted EV adoption rates by a factor 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."**

Changes to Scenario #2

- "Natural gas prices utilized are consistent with reference case projections as projected in the EIA's most recent Annual Energy Outlook reference case."

- The filing utility should be able to utilize a different forecast if it is publicly available or can be made available through confidentially agreements. They will explain the basis for the use of forecast that is not the most recent EIA-AEO reference case. – *Consumers Energy*
  - *Staff response: We believe leaving the current language is the best method for ensuring accurate information.*

Changes to Scenario #2

- “EV adoption and customer electrification cause adjustments in overall load profiles ~~as electrification and EV’s are adopted~~ through the planning horizon ~~consistent with the most recent MISO Future 3. ~~”

- With the significant adoption assumptions, the expectation is the loadshape would change significantly. To model this MISO would need provide the loadshape assumptions or loadshape assumptions should be agreed upon and consistently applied across utilities. DTE suggests allowing each utility to determine an aggresive load forecast specific to its service territory. – *DTE*
  - *Staff response: Staff removed the MISO Future 3 reference and instead is relying on EIA AEO EV projections with a factor of 5 that should provide visibility about the impact of accelerated EV adoption. Certainly, this will continue to be evaluated and refined as we know more about the future of EVs.*

Changes to Scenario #2

- **“Utilities should use the most recent EIA AEO East North Central Census Region 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.”** – Staff addition

- “~~Generic new resources (market and company-owned) are assumed consistent with scenario descriptions and considering anticipated new resources currently in the MISO generation interconnection queue. ”~~ – Staff change

- “~~The plan meets current state and federal goals for greenhouse gas emissions.~~” - Staff change

Staff comment: Duplicative with filing requirements

- **“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**.**”** – Staff addition/rework in response to comments

Recommended removal because it shouldn’t be in modeling – *DTE*
I&M recommends simplifying this to only include a consideration of long and short duration storage resources. Furthermore, I&M requests staff to define what would be considered short and long duration. Additionally, I&M is concerned that incorporating any distribution and possibly transmission co-benefits in an IRP modeling effort would presume a level of locational precision in the modeling that IRP’s do not address and recommends deleting this as a requirement or more precisely articulate the specific expectations to consider. – *I&M*

Staff response: It will be moved to filing requirements as a narrative post model evaluation option.

Changes to Scenario #2

- "Technology costs for wind, solar, storage and other renewables decline with commercial experience and forecasted at levels 30% ~~lower than in the base case.~~"

- 30% reduction *from the base forecast by the end of the study period.* - Consumers Energy

- "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**."

Changes to Scenario #2

- “~~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 publicly indicates, or indicates directly to the utility, otherwise. – *Consumers Energy*
> 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 publicly indicates, or indicates directly to the utility, otherwise. – *Consumers Energy*

- **“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 Sensitivity Changes

3. “Ramp up the utility’s EWR savings to at least 2.0% of prior year sales over the course of four years, using EWR cost supply curves provided in the ~~2017~~ **2021** supplemental potential study for more aggressive potential. EWR savings remain **2%** ~~high~~ throughout the study period.”

- An update will be performed to reference the more recent study. – *Consumers Energy*
- “2021 MI Statewide Energy Waste Reduction Potential Study or other more recent statewide potential study” - *DTE*

Scenario #2 Sensitivity Changes

4. "~~Out-of-State transmission congestion cost increases due to changing resource mix across the region. Assume transmission costs increase by XX%.~~ "

- Out-of-state transmission congestion results in increased cost of energy imported into Michigan. Assume transmission cost increases of YY%. – *Consumers Energy*
- This sensitivity needs additional discussion and clarification, it is unsure at this time what the goals and structure of this sensitivity are. – *Consumers Energy*
- DTE Suggests removing.
  - How will this be determined? Will there be a study commissioned by the MPSC from METC/ITC and/or will MISO be providing something that can be used the utilities? There is a lot going on with different transmission projects and construction timelines as well as ambiguity about what is the starting point/baseline to determine this. In addition, our model don't differentiate which zone MISO purchases come from. - *DTE*

Scenario #2 Sensitivity Changes

5. Carbon Price Sensitivity?

Initial comments regarding inclusion of a carbon price sensitivity are that there are options to model carbon price as a sensitivity or incorporate a carbon price into the base assumptions of this second scenario and allow utilities to then choose whether it is prudent to run additional carbon sensitivities in this scenario. – *Consumers Energy*

The Company's recommendation would be to not specify in the filing or modeling requirements which forecast to use but leave the chosen forecast to the discretion of the utility, with justification for the forecast used. This is due to the following reasons:

(a) Carbon prices in regulated markets (e.g., CA, RGGI, Europe, etc.) have been trending slowly up for a few years now, and that trend is likely to continue – which means we'd want to be able to use the latest data at the time of filing,
(b) Carbon prices vary considerably based on market construct, again suggesting flexibility is warranted
(c) Carbon prices trends can also be observed through what prices are proposed in Congress, which also vary considerably from year-to-year. – *Consumers Energy*

AEE and Michigan EIBC encourage Staff to require IRP parameters to include a low or no carbon price, as well as medium and high carbon price sensitivities to accurately consider the potential for a legislatively mandated carbon price, either at the state or federal level, over the timeline of the IRP planning horizon. We recommend that Staff incorporate a phase-in of these carbon price scenarios over a 10-year period to simulate how a mandated carbon price could be introduced. – *AEE and MEIBC*

Add a carbon price and growth of voluntary green pricing programs and renewable power purchase sensitivity. – *City of Ann Arbor*

Staff response : VGP growth is based upon uptake so the intent is not clear. Carbon price when there is already a policy to reduce carbon to net-zero seems like double counting. Removed altogether. It would be duplicative of our carbon policies already in place.

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Break

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Scenario #1 Changes & Discussion

Karsten Szajner

MPSC

Michigan Public Service Commission

Scenario #1 Comments & Changes

Paragraph 1 edits:

- "This **scenario aligns with MISO's December 2021 Futures Report, Future 1 reflects substantial achievement of state and utility announcements. This scenario** incorporates 100% of utility integrated resource plan (IRP) **retirement announcements throughout the MISO footprint, as identified in MISO Future 1. As subsequent Futures Reports are released, updated retirement assumptions identified in the Future most similar to Future 1 of the December 2021 report should be used.** Emissions decline, driven by state goals and utility plans throughout the MISO footprint creating **at least a** 63% **carbon reduction** by 2039 from the baseline year of 2005 for the MISO region. **This trajectory of carbon reduction is expected to continue beyond 2039."**

- Comments from I&M, CE, and DTE on language around usage of MISO Futures
  - Staff made edits for to help with clarification on using the MISO Futures for retirements and expected market purchase emissions in the out years of the planning horizon.

Scenario #1 Comments & Changes

Paragraph 2 edits:

- "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 demand and energy growth rates. The increase in EV adoption**, result in an annual energy growth rate of 0.5% outside of Michigan. **Utilities should use the most recent EIA AEO East North Central Census Region 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."**

- Comments from CE, I&M, and DTE with various suggests regarding rewording for EV adoption, load growth, and MISO future use.
  - Staff made the above underlined edits based on feedback.

Scenario #1 Comments & Changes

Paragraph 3 edits:

- "Moderate EV adoption and customer electrification result in moderate footprint-wide18 demand and energy growth. **Within Michigan, EV and electrification forecasts should be** blended **with** historical such that **after** 5 **years, Michigan's load and demand increase reflects the source forecasts for EV and electrification technologies. Load profiles of EVs and electrification technologies should be clearly delineated and presented individually such that it is clear how they each impacted the overall energy and demand forecast. EV forecasts should be based off of the Reference Case in the most recent EIA AEO East North Central Census Region. Electrification technology forecasts** should be based off of either established proprietary forecasts or publicly available data. Load profiles of EVs as well as any electrification technologies should be clearly delineated and presented."

- Comments from DTE suggested rewording and removal of a specific footnote. I&M recommended a definition of the term "moderate".
  - Staff made the above underlined edits with DTE's suggestion, removed the specified footnote, and attempted to clarify the use of "moderate".

Scenario #1 Comments & Changes

Paragraph 4 edits:

- "Resources assumptions– MISO Future 1 retirements **for thermal and nuclear generation** resources published by MISO **in the most recent Futures Report** should be used **when available along with recent public announcements**. Maximum age assumption by resource type as specified by applicable regional transmission organization (RTO) **should also be used**. Specific new units are modeled if under construction or with regulatory approval (i.e., Certificate of Necessity (CON), IRP cost pre-approval, or signed generator interconnection agreement (GIA). Generic new resources are assumed consistent with the scenario description, considering anticipated new resources **currently in generation interconnection queue, and should be chosen based upon economics.** "

- Comments from CE suggested rewording to combine both bullets under this paragraph. DTE wanted to strike certain language. I&M also wanted various clarifications.
  - Staff made the above underlined edits with CE's suggestion which in turn addresses DTE's request.

Scenario #1 Comments & Changes

Scenario 1 continued:

"The utility can illustrate how the plan is expected to meet state goals for greenhouse gas emissions specific to the power industry sector."

- Comment from I&M concerning using goals not required by law. DTE also suggested to add "specific to the power industry sector".
  - Staff thinks utility goals are more aggressive than current state and federal targets. Limiting to state goals may also align better with those utilities with multi-state jurisdictions

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

- Comment from DTE asking for change made which has been added by staff above.

Scenario #1 Comments & Changes

Scenario 1 continued:

"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 thermal units and wind track with mid-range industry expectations."

- Comment from DTE suggested deleting the incorporation of distribution and transmission co-benefits from the first bullet above.
  - Staff accepted this change.
- I&M wanted definitions for long and short-term duration and recommended bullet two be based on the utility's determination of the costs.
  - Staff doesn't think a definition is necessary if both are being considered and think a utility should be benchmarking at mid-range.

Scenario #1 Comments & Changes

Scenario 1 continued:

"Technology costs and limits to the amount available for EWR and demand response programs will be determined by **the most recent** State-wide Potential Study."

"Technology costs for solar, storage, and other emerging technologies decline with commercial experience **consistent with NREL or other publicly available reputable sources**."

- Comment from DTE to include "the most recent" in the first bullet was accepted by Staff. They also requested clarification for what bullet two was based on which Staff has elaborated above.
- I&M recommended using the utility's potential studies and wanted Staff to define its intentions for how bullet two applied to other resources.
  - The law states for the us of the State-wide Potential study and other types of thermal and wind units are defined in early portions.

Scenario #1 Comments & Changes

Scenario 1, additions to PURPA:

"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.**"

- Comment from DTE to add above changes which Staff has included.

Scenario #1 Comments & Changes

Sensitivity General Comments:

- The City of Ann Arbor and ABATE asked if a carbon price was being considered in this scenario.
  - A carbon price is not included in this scenario. Current utility carbon targets/goals are already aimed at carbon neutrality. Staff would consider adding one if there were a nationwide or reginal carbon market.
- Michigan EIBC/AEE recommended the inclusion of weather in an atypical as a sensitivity.
  - Staff thinks that a Non-typical year would be better analyzed in a short-term risk assessment and not a sensitivity that lasts for the duration of the planning period.

Scenario #1 Comments & Changes

Sensitivity 1:

"Fuel Cost Projections

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

- Comments from I&M recommend additional discussion for this scenario stating that, "A preliminary concern is that this is a potentially extreme scenario and implies very limited supply availability as well as high prices."
  - Staff thinks that using the publicly available EIA data is reasonable and refreshed regularly.

Scenario #1 Comments & Changes

- **Sensitivity 2**:

  "Load projections:

  a. High load growth: Increase the energy and demand growth rates by at least a factor of two above the base case energy and demand growth rates **on a per customer basis**."

  - Comments from I&M requested an energy growth of 1.5% on a per customer basis.
  - DTE suggested deleting the section regarding the DG tariff.
    - Staff has changed section a to include I&M's suggestion with the underlined language above. Staff also removed the section DTE recommended.
  - Comments from CE suggested the removal of this sensitivity to be replaced with a version that looks at the high load growth assumed in Scenario #2.
    - Staff disagrees with this suggestion because the results from scenario 2 are not directly comparable on an NPV basis to those in Scenario 1 due to different assumptions about the world.

Scenario #1 Comments & Changes

Sensitivity 2 Continued:

"b. MISO load growth: A load growth scenario that is consistent with the most recent MISO future."

- Comments from CE and DTE suggested the removal of this sensitivity due to MISO Future 1 not developing a utility specific load and demand forecast.
  - Staff is wondering if we can align with MISO on load growth but keep the utility specific load shape?

Scenario #1 Comments & Changes

Sensitivity 2 Continued:

"c. Low load growth: EV adoption and electrification are slower than expected. Demand and load growth **are consistent with 5-year historical growth rates prior to 2020 and the onset of COVID-19**."

- Comments from DTE/CE for revision. CE stated that given the current carbon goals that this scenario is unlikely to occur and proposes its removal.
  - Staff accepted the edits made by DTE and believe the sensitivity is necessary to see what we are paying if we build too much.

Scenario #1 Comments & Changes

Sensitivity 3: "**If the utility is not already achieving 2% EWR**, ramp up the utility's EWR savings to at least 2.0% of prior year sales over the course of four years. EWR savings remain **at 2%** throughout the study period."

- Comments from I&M regarding various clarifications and DTE offered modification to the sensitivity's wording.
  - Staff has changed to include underlined section in the sensitivity.

Scenario #1 Comments & Changes

Sensitivity 4:

~~"Perform a model run that optimizes the resource build that considers only legislatively mandated carbon goals for the region and does not consider non-legislatively mandated carbon goals for outside if Michigan. Demonstrate a path to Michigan's carbon goals and the impact to energy imports."~~

- Comments from I&M regarding various clarifications and CE was opposed to the inclusion of this sensitivity.
  - Staff has recommended the removal of this sensitivity.

Scenario #1 Comments & Changes

Sensitivity 5:

~~"Out-of-State transmission congestion cost increases due to changing resource mix across the region. This results in a higher cost added for out of state resources. Work collaboratively with the incumbent TO to develop the appropriate cost adder."~~

- Comments from Consumers Energy and I&M regarding various clarifications and suggested rewording of this sensitivity.
  - Staff has recommended the removal of this sensitivity.

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Closing – Questions?

Written Feedback Request

Staff encourages all stakeholders to provide written feedback that recaps their feedback during discussion.

Staff would like feedback on the following:

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

Feedback Request

We look forward to your written comments in response to Staff's feedback request. Your participation is critical.

Please submit responses to the stakeholder feedback comments received to Kayla Gibbs by

April 4th, 2022, 5pm ET.

GibbsK2@Michigan.gov

MI POWER GRID

Making the Most of Michigan's Energy Future

Thank You

Upcoming Advanced Planning Stakeholder Meetings

April 26th 9:00 am – 12:30 pm

MPSC

Michigan Public Service Commission