

## Memorandum

**To:** Lynn Beck, Katie Smith, Roger Doherty, MI Public Service Commission (MPSC)

**From:** Will Supple, Debyani Ghosh, Neil Curtis, Stu Slote, Guidehouse

**Date:** May 18, 2021

**Re:** MI Statewide EWR and DR Potential Study, Stakeholder Feedback

This memo outlines the stakeholder feedback Guidehouse received to the Global Inputs data. It is organized by stakeholder, their comments, and Guidehouse's response.

### 1. Joseph A. Forcillo

Consumers Energy  
Joseph.Forcillo@cmsenergy.com  
Email date: April 30<sup>th</sup>, 2021

### EWR Comments

Thank you for the opportunity to review these assumptions. We find most of your assumptions to be reasonable and offer the following questions, comments and suggestions where a few important assumptions could be made clearer or strengthened. These comments are provided both within this email as well as in the attached Word document for your ease of review and use.

Consumers Energy has reviewed the EWR Potential Study summary of global inputs memo and spreadsheet that includes descriptions and data related to technical and economic market characterizations including:

- Electric Energy Sales and Peak Demand Forecasts for Electric
- Gas Energy Sales Forecast
- Residential and Commercial and Industrial Building Stock
- End Use Allocations
- Space Heating and Water Heating Fuel Type Multipliers

- Measure Density and Saturation
- Electric (Energy and Peak Demand) and Natural Gas Avoided Costs
- Electric and Natural Gas Retail Rates by Sector
- Line Losses
- Reserve Margin
- Inflation

### **Building Stock and End-Use Allocations**

In general, the allocation of building stock across residential housing types/segments seems reasonable. The same allocation across single family and multifamily units is used for the Lower Peninsula and Upper Peninsula, and similarly the same allocation of estimate of low-income households is used for single-family and multi-family. There are likely some differences, but these may not make a significant difference in the results. The end-use allocations seem to accurately characterize differences in energy use between single family and multifamily housing and income levels, but there may be differences between the Upper and Lower Peninsulas. We note there is no allocation to manufactured housing.

Guidehouse estimated square footage for nonresidential buildings by using average energy use intensities (EUIs) from the Energy Information Administration (EIA) to the overall sales forecast. The segmentation of nonresidential square footage is relatively high level, divided into small commercial, large commercial, and industrial. Because energy intensity varies across different building and industry types within commercial and industrial sectors, more granular segmentation and characterization of energy consumption by end use would support better estimates of EWR potential.

Guidehouse indicates that because data from the utilities were limited, they used EIA's Residential Energy Consumption Survey (RECS), Commercial Building Energy Consumption Survey (CBECS), and Manufacturing Energy Consumption Survey (MECS) to derive end use allocations estimates for the residential, commercial, and industrial sectors, respectively. Where available, they used regional data to do the end-use allocations.

The same allocations are used for electric energy and peak demand across all sectors and segments (e.g., 21% of residential energy use and peak demand are allocated to space heating, a primarily off-peak use). We would note that energy use and peak demand vary significantly across different end-uses.

We have the following questions related to building stock and end-use allocation:

1. Can Guidehouse confirm if they intend to model measures at a sub-segment level (e.g. office, retail, grocery, etc.) as opposed to the customer segment (e.g. large commercial and small commercial) level?

**Guidehouse Response:** Guidehouse does not plan to model sub-segments.

2. Can Guidehouse please confirm the year of each of the EIA studies referenced in MI 2021 EWR Potential Study Global Inputs Summary? Are these 2012 CBECS, 2015 RECS, and 2018 MECS?

**Guidehouse Response:** The EIA studies references are 2012 CBECS, 2015 RECS, and 2014 MECS.

3. Can Guidehouse confirm if the average EUIs from EIA that were applied to the sales forecast to determine total building square footage was done at the sector (e.g. commercial and industrial) level only or if segment level (large, small) or sub-segment level (e.g. office, retail, grocery, etc.) EUIs were also used?

**Guidehouse Response:** EUIs are differentiated by segment in this study.

4. Will Guidehouse use load shape data to more precisely allocate energy and peak demand across end-uses?

**Guidehouse Response:** Loadshape data is used to model avoided costs for applicable savings types more precisely by end use.

### **Space Heating and Water Heating Fuel Type Multipliers and Measure Density and Saturation**

These are discussed in the summary memo, but not included in the spreadsheet. Of particular interest is the measure density and saturation assumptions. Guidehouse has listed some relatively dated studies (e.g. 2011 Michigan Baseline Reports and the 2016-17 DTE Energy Baseline Study) and notes that they may adjust saturations based on “historical program performance and regional trends” including “sources from similar jurisdictions to benchmark values against similar recent studies.”

There has been a significant amount of program activity and many market changes since those studies were conducted. Examples include nearly full penetration of some EWR measures in the multifamily housing and significant changes in the commercial lighting market.

We have the following questions related fuel type multipliers, measure density, and saturation:

5. Can Guidehouse provide more detail regarding the planned use of “historical program performance and regional trends” data it plans to use to adjust measure density and saturations? What sources of information will Guidehouse use?

**Guidehouse Response:** Throughout the modeling process, Guidehouse compares potential results to key indicators, such as sales forecasts to QC measure inputs at a high level. Due to the vintage of available density and saturation data, Guidehouse may use known installation rates of efficient equipment through utility programs to

help guide directional change assumptions in efficient measure saturation to better align measure assumptions with present day stocks.

6. Is Guidehouse open to using data from more recent studies, e.g., Consumers Energy's 2019 Commercial and Industrial Market Assessment and Consumer Energy & DTE's Baseline Housing Stock Study for the Lower Peninsula?

**Guidehouse Response:** Guidehouse has requested this additional data from Joseph Forcillo (5/12/2021) and will review for applicability and adjust measure inputs when appropriate.

7. Can Guidehouse describe which "similar jurisdictions" against which it plans to benchmark values against similar recent studies?

**Guidehouse Response:** Guidehouse will review recent potential studies completed across North America including studies in Pennsylvania, Massachusetts, California, and Ohio.

8. Will there be an opportunity to review these assumptions in more detail as they become available?

**Guidehouse Response:** Except for Ohio, the referenced project studies are publicly available and will be referenced in the final report. Guidehouse does not plan on detailing individual assumptions at the measure level.

### **Avoided Costs**

Guidehouse developed avoided cost forecasts using data provided by the utilities, either directly or through their DSMore files that provided Lower Peninsula and Upper Peninsula forecasts by year for:

- On-peak and off-peak electric energy
- On-peak and off-peak electric demand
- Natural gas

Guidehouse provides a few different definitions of peak periods, including the MEMD definition of system peak and PJM's definition of on-peak hours within the day.

Questions or comments related to avoided costs include:

9. It would be useful to compare the avoided cost forecasts constructed from utility forecast to market-based references such as MISO forecasts of energy (electric and gas) costs data for the Michigan hub and results of MISO's capacity planning resource auction.

**Guidehouse Response:** Avoided costs have been developed to estimate utility energy efficiency evaluation values using DSMore inputs. Additional avoided cost analysis is not planned.

10. Can Guidehouse provide a definition of when on-peak and off-peak avoided costs would be applied in cost-effectiveness analysis? In addition to time-of-day, are seasonal factors considered?

**Response:** On-peak and off-peak avoided costs are used in conjunction with loadshapes to adjust weighted electricity costs based on a measure's end use. The MISO peak definition is used to develop end use loadshapes. Each loadshape is applied to on- vs off-peak market prices based on its calculated ratio, shown in the Loadshapes tab. Seasonality is embedded in energy prices received from the utilities in their DSMore files.

### Load Shapes

Guidehouse describes use of load shapes to allocated energy consumption by end-use to on-peak and off-peak periods. These allocations do not seem to consider seasonal aspects of energy consumption. In addition, it is not clear how peak demand impacts of EWR measures will be determined?

Questions or comments related to avoided costs include:

11. Could Guidehouse describe how peak demand impacts will be determined?

**Guidehouse Response:** Measure demand reductions are characterized as on-peak based on the MEMD. These on-peak demand reductions are applied to the peak demand avoided cost as determined using utility DSMore input templates.

### Line Losses

Guidehouse developed electric system line loss estimates by sector based on data provided by utilities by weighting losses by utility sales data. No distribution loss estimate was provided for natural gas.

12. Could Guidehouse provide additional information about how line losses by sector were determined?

**Guidehouse Response:** Most utilities provided line losses through their DSMore files. These line losses were not initially broken out by sector. However, other utilities were able to provide line losses at the sector level. The relative differences between line losses at the sector level for those providing that data was used to estimate sector differences for the other utilities based on sales. These values were then weighed by sector to provide peninsula-wide estimates. NOTE: This methodology is an update from the draft global model data provided previously.

13. Was there any consideration of differences in line losses by season (i.e., summer and winter)?

**Guidehouse Response:** Line loss values were sourced from utility DSMore files to be consistent with program cost-effectiveness evaluations. These sources did not include differences in seasonal losses, but offer an annual loss rate.

14. Will Guidehouse consider natural gas distribution losses?

**Guidehouse Response:** Natural gas losses sourced from utility DSMore files are included to be consistent with utility evaluations. Guidehouse will not include additional losses to those provided in the DSMore files, however, a sensitivity analysis looking at the impact of changing line loss values will be conducted.

There are no questions related to retail rate, discount rate, reserve margin, or inflation assumptions.

Thank you for the opportunity to review these inputs. We look forward to learning your perspectives on the issues raised and continuing to collaborate on this important research.

## 2. Antonette D. Noakes

Consumers Energy

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Email Date: April 30<sup>th</sup>, 2021

### DR Comments

Consumers Energy is cognizant of the work being performed on the Michigan Energy Waste Reduction (EWR) and Demand Response (DR) Statewide Potential Study, and appreciates the opportunity to provide constructive feedback during the process. The company has been assisted by some of its partners in its analysis of the EWR and DR global input summaries which describe the approach used to develop market characterization data for assessing Michigan's EWR and DR Potential. This communication will provide feedback specifically on the DR components; EWR information will be provided separately.

Some items of note include:

1. Some measure impacts look like they may be inaccurate or their sources misinterpreted; possibly the inputs are too large or there may be double-counting.

- a. The data seems to assume Small C&I has higher air conditioning load reductions than residential but that does not align with the small C&I DR evaluations – see the Navigant (now Guidehouse) PECO evaluation from 2019

(<https://www.peco.com/SiteCollectionDocuments/PY10SemiannualandDR.pdf>)

**Guidehouse Response:** The unit impacts are specified per participant and not per device. The reason small C&I unit impacts per participant are greater than that of residential is because small C&I customers on average are assumed to have a higher number of AC units per customer than residential. This is supported by data from Eversource's Residential and Small Medium Business Thermostat DLC evaluation.

Please see sources below:

[https://www.puc.nh.gov/EESE%20Board/EERS\\_WG/eversource\\_demand\\_demonstration\\_041818.pdf](https://www.puc.nh.gov/EESE%20Board/EERS_WG/eversource_demand_demonstration_041818.pdf)

<https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/12189967>

We will confirm what the EWR assumptions are on central AC penetration (number of AC unit per customer) for small commercial customers and adjust input assumptions accordingly.

- b. The small C&I PTR impacts should not be twice as large as Residential impacts given that this is not the case for other dynamic pricing measures.

**Guidehouse Response:** Guidehouse will update small C&I PTR impacts to be “% of total peak demand” instead of “kW reduction per customer” and will use secondary information sources for the assumption. The characterization of unit impacts as “% of peak demand” for PTR will be consistent with how unit impacts are specified for other dynamic pricing options.

- c. Dynamic pricing impacts look too high overall. There may be some CPP/PTR event day impacts double-counted with non-event day impacts. Specifically, Residential CPP impacts should be incremental to the non-event day impact, and PTR impacts should be incremental to the non-event day impact.

**Guidehouse Response:** The dynamic pricing impacts for residential for PTR and CPP are directly sourced from Consumers Energy’s and DTE’s program filing, plus program performance information that Consumers and DTE provided as part of the data request. The residential impacts are in terms of average “kW reduction per customer” during CPP or PTR event period, which is directly sourced from the program performance data. It is unclear what the comment implies by stating that “event day impacts are double-counted with non-event day impacts”, so we would like further clarification on that.

Dynamic pricing unit impacts for other customer classes where MI utilities do not offer any programs and for which program performance data is not available, Guidehouse used well established secondary sources to develop those assumptions, which are documented in the sources. These specify impacts as “% reduction in peak demand” during the event period, and that is how Guidehouse plans to use these assumptions for calculation of the peak reduction potential.

- d. The Res Time-Of-Use percentage reduction looks high; reductions should be closer to 3-4.5% rather than 7%. It is possible that the 7% is for opt-in rather than default rates. (Opt-in typically has larger impacts, but lower enrollment.) Note that without careful attention the default Time-of-Use effect could actually be triple-counted - (1) removed from peak load forecast (2) embedded in the CPP and PTR per-unit impacts (3) modeled as a standalone measure.

**Guidehouse Response:** Guidehouse seeks clarification from Consumers Energy on the following item to be able to respond to this comment:

- i. Are TOU impacts included in the peak demand projections Consumers Energy has provided? In case TOU impacts are included, Guidehouse will not consider separate impacts from TOU in the potential calculations. In case TOU impacts are not included, Guidehouse will assume the 3-4.5% unit impact assumptions suggested in the comment.



Guidehouse's approach toward potential calculation ensures that impacts are not double counted between options. So, in this case, Guidehouse will exclude customers enrolled in CPP/PTR programs in TOU impact calculations, so that impacts are not double counted.

So, in summary, we will exclude TOU impacts if Consumers Energy confirms that TOU impacts are included in the peak demand projections. If these are not, we will assume the 3-4.5% impacts for default TOU rates, and exclude CPP and PTR participants in the calculation of TOU impacts, so that impacts are not double counted.

- e. Using a flat kW value for thermal storage does not capture the high level of variation likely to be seen if a larger program were implemented. Additionally, extrapolating a flat kW value from a study with as few as 8 participants is not advised.

**Guidehouse Response:** Guidehouse will change TES impacts to be “% of demand” instead of flat kW to account for variations in impacts.

- f. The customer counts forecast for Consumers Energy varies somewhat unexpectedly from year to year in the first few years of the forecast (e.g. gains 15K customers one year then loses 21K customers the next year). One year has a particularly large jump (2027 sees almost a 4% increase in customers that doesn't continue after that year).

**Guidehouse Response:** The variations in the customer count (and peak MW) projections are caused by variations in the sales forecast provided by Consumers. Forecasted sales vary year-to-year and, for example, include a large spike in 2027. The customer count forecast follows the trend in sales forecast.

2. Key assumptions:

- a. Participation rates and participation assumptions are not provided, which are key drivers for assessing DR potential. (A seemingly reasonable per-unit kW impact assumption will result in unreasonable DR potential if the study team assumes unrealistically high or low enrollment rates given the incentive level of program delivery model.)

**Guidehouse Response:** We only provided assumptions for technical potential calculations. We are in the process of developing participation assumptions based on survey results which will feed into achievable potential calculations.

- b. Event window definitions are not provided. (Event duration and frequency can matter for options such as connected thermostats. While the “top 40 hours” definition is useful, twenty two-hour events would return different results from four 10-hour events.)

**Guidehouse Response:** We will define these when we describe the DR options in the report.

- c. Cycling strategies for DLC switches are not explained.

**Guidehouse Response:** We will define these when we describe the DR options in the report.

- d. It is not clear if the effect of Consumers Energy’s default Time-of-Use implementation is accounted for in the load forecast for Consumers Energy.

**Guidehouse Response:** We have requested from Consumers Energy whether the impact from default TOU rates is included in the sales and peak demand projections data, and the 8760 system load forecast data provided by Consumers Energy. If that is the case, we will not account for it in our potential estimates.

- e. It is not clear if smart thermostat adoption is included in the forecast. If so, the setback strategy is not described which could impact the study.

**Guidehouse Response:** It is unclear from the comment what forecast it is referring to. Smart thermostat based DLC is included as a DR option. The temperature setback strategy assumed for the unit impacts will be described in the DR options in the report.

- f. It is not clear if electric vehicles are included in the forecast. (The Electric Vehicle Managed Charging measure assumes 95-99% reduction in peak load from Electric Vehicles. However, the unmanaged load from Electric Vehicle is unclear.)

**Guidehouse Response:** Electric vehicle count and load forecasts were developed as a separate model input based on vehicle counts from DTE and Consumers and EV load profiles from Consumers. This is used as the baseline for estimating potential from managed charging.

- g. It is not clear if storage is in the forecast.

**Guidehouse Response:** Yes, storage is included in the potential forecast.

- 3. The segmentation of residential accounts is not very granular (single family, multifamily, low-income, market rate) and will not provide information on which

customer segments are most appealing for marketing DR programs. Utilities will need to obtain this information independently.

**Guidehouse Response:** A potential study will not go into additional level of granularity. The segmentation presented is what was agreed upon between MPSC and Guidehouse.

Thank you for the opportunity to provide our input to ensure that the study is accurate and useful. Please reach out to me if you have any questions.

### 3. Andrew McNeally

UPPCO

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Email date: April 30<sup>th</sup>, 2021

#### Comments

UPPCO appreciates the opportunity to provide feedback on the Michigan EWR Statewide Market Potential. Here are our observations and comments:

1. UPPCO presented and provided the results of our Market Characterization Study Phase 1 results including housing type, income, age and heating fuel but this information does not appear to be incorporated into the inputs summary.

**Guidehouse Response:** Guidehouse used the UPPCO Market Characterization Study to help determine fuel splits for the upper and lower peninsulas. However, as these inputs were collected in Guidehouse's primary research, the UPPCO data was used as a secondary source.

2. UPPCO's concern is that Lower Peninsula (LP) research and assumptions will be extrapolated to the Upper Peninsula (UP) when there are known differences in housing stock and heating fuel.

**Guidehouse Response:** Guidehouse has completed primary research to determine heating fuel type mix by Peninsula. Guidehouse has captured differences in Upper Peninsula and Lower Peninsula housing stock and fuel types where possible.

3. Should there be a forecast of demolish rate over the study period to reflect such initiatives as MI Healthy Climate and greenhouse gas emission reductions instead of 0.50% which results in the 200 turnover of building stock that will not meet 2050 carbon goals of the State?

**Guidehouse Response:** Guidehouse and the MPSC do not have data to support an adjustment to the assumed demolition rate. Therefore, we will continue to use the assumed 0.50% per year.

4. Could an explanation of or the calculation of kWh, kW and Gas avoid costs be provided because the kWh Avoid costs for the UP are 125% of the LP, while kW Avoid costs for the UP are 55% of the LP, and Gas Avoided costs for the UP are 135% of the LP?

**Guidehouse Response:** Guidehouse requested economic data from each utility through DSMORE input files. For each utility providing data, Guidehouse developed a weighted average avoided cost by savings type based on utility sales for the Upper

and Lower Peninsulas. The differences in avoided costs by savings type between the two territories are a direct result of these inputs.

5. The inflation rate of 2.01% held constant is understandable, but has it been indexed to a regional or national inflation index such as CPI-U which is trending in recent years a bit higher at 2.5-3%?

**Guidehouse Response:** The inflation rate is a weighted average across utilities providing this input in their DSMore files. Guidehouse used this value to align with utility cost-effectiveness evaluation inputs.

6. Please provide the rationale for the different discount rates between LP and UP, especially the Societal Cost Test discount rate, as the assumption would be that regulated utilities would have similar weighted average cost of capital (WACC) across the State.

**Guidehouse Response:** The discount rates are a weighted average across utilities providing this input in their DSMore files. Guidehouse used this value to align with utility cost-effectiveness evaluation inputs. Any differences in utility WACC are direct inputs from the DSMore files.

#### 4. Chris Neme

Energy Futures Group

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Email Date: April 30<sup>th</sup>, 2021

#### Comments

1. Electric Sales Forecast (kWh/year), Gas Energy Sales Forecast (therms/year): Pp. 1-2: the memo states that Guidehouse used utility sales forecasts. Did Guidehouse confirm how those sales forecasts were developed? In particular, were they based on extrapolation from historic sales levels? If so, that would mean that they included the effects of new efficiency programs – at least for historic data starting in 2009. Did Guidehouse adjust the forecasts to account for how much faster sales would have been growing without efficiency programs for the purpose of estimating how fast sales would grow in the no-new EWR baseline for future sales from which the efficiency potential study should estimate savings? Or did the utilities make such adjustments themselves before providing the forecasts to Guidehouse? If not, the baseline sales forecast the Guidehouse would use for estimating savings potential would be lower than it should be.

**Guidehouse Response:** Guidehouse has confirmed that sales forecasts do not include energy efficiency forecast adjustments or made updates where necessary to remove these. Final sales forecasts will not include energy efficiency savings forecasts.

2. Peak Demand Forecast (kW): Since electric peak demand forecasts were based on sales forecasts, the baseline (no new EWR) forecast could be understated for the same reason the electric (kWh) sales forecast could be understated.

**Guidehouse Response:** Guidehouse has confirmed that sales forecasts do not include energy efficiency forecast adjustments, or made updates where necessary to remove these. Final sales forecasts will not include energy efficiency savings forecasts.

3. End Use Allocations: What was the estimated saturation of electric heat in residential single family and multi-family buildings? Census data (American Community Survey data for 2019) could be used to support such assumptions. Pasted below is a summary of such data, by residential building type, for the state as a whole. Such data can also be extracted at the county and/or city level.

**Guidehouse Response:** Guidehouse used its primary research to develop heating fuel type saturations. The table below shows the electric heating saturation for the residential segments of the Upper and Lower Peninsulas.

Territory	Customer Segment	Electric Heating Saturation
Upper Peninsula	Single Family	3.5%

Upper Peninsula	Multifamily	6.6%
Upper Peninsula	Single Family Low-Income	9.1%
Upper Peninsula	Multifamily Low-Income	15.4%
Lower Peninsula	Single Family	4.3%
Lower Peninsula	Multifamily	8.6%
Lower Peninsula	Single Family Low-Income	10.5%
Lower Peninsula	Multifamily Low-Income	19.6%

4. Residential Building Stock: C&I Building Stock -The memo states that demolition rates are assumed to be 0.05% per year and that translates to a 200-year building stock turnover. Did Guidehouse mean 0.50% instead of 0.05? A demolition rate of 0.05% equates to a 2000-year turnover rather than 200-year turnover.

**Guidehouse Response:** Yes, Guidehouse is using an assumption of 0.50% or 200-year turnover.

5. Space Heating and Water Heating Fuel Type Multipliers: Census data referenced above would seem to be a better source for assumptions. The suggestion that upper peninsula fuel-splits would be the same as for the lower peninsula does not seem reasonable. There is less access to natural gas in the upper peninsula. We presume that means there is more likely to be higher saturations of electric heat. However, that hypothesis could be tested easily by summarizing county level Census data for the UP (from the source referenced above).

**Guidehouse Response:** Guidehouse has completed primary research to determine fuel split multipliers between the upper and lower peninsula since the release of the global data input memo. These values will be used in the study.

6. Measure Density and Saturation: Are these assume to stay static over time? We would expect that saturations of certain end uses – like central air conditioning, computers and other electronics to grow over time. We would also suggest that heat pump saturations are likely to be growing as well, in part in response to customers interested in reducing carbon footprints and in part to reflect the improvement in the technology and related cost advantages relative to propane heating.

**Guidehouse Response:** In the context of the potential study, densities refer to the number of measure units per home or building space, and saturation refers to the percentage of that technology that is efficient in any given year. The model will simulate adoption from the base year to adjust efficient saturation throughout the study period. However, the model will not project changes in absolute technology density through time.

7. Economic Potential Inputs: The notion that avoided T&D costs are zero is not reasonable. At a minimum, there should be a sensitivity applied based on typical average avoided T&D costs nationally or regionally (a 2014 study conducted by the

Mendota Group for Excel Energy in Colorado found a national average value of about \$70/kW-year).

**Guidehouse Response:** The zero T&D avoided cost assumption is out of date. Please see the latest Excel input summary file provided by the MPSC for estimated values.

8. The memo makes reference to DSM inputs, presumably for energy and capacity. With respect to energy, it is important to note that DSMore has multiple options to consider. The one most commonly used by utilities is what one might call the “best estimate” of avoided energy costs. However, DSMore also provides screening results for a probability-weighted average avoided energy cost. That would be a more appropriate set of values to use.

**Guidehouse Response:** Guidehouse confirms that the probability-weighted average avoided energy costs are being used from the utility DSMore input files.

9. Electric Loadshapes: Why would PJM definitions of peak be used instead of MISO given that most of Michigan is MISO territory?

**Guidehouse Response:** Guidehouse’s research suggests that the MISO and PJM definitions for avoided cost peak periods are the same. See link below. See link below.

<https://www.mirecs.org/faqs/what-is-the-definition-of-on-peak-hours-in-mirecs/#:~:text=On%20Peak%20period%20is%20defined,Monday%20immediately%20following%20the%20holiday>

10. Avoided Costs: Is Guidehouse using a carbon adder for either electric or gas avoided costs? If not, it should – not because of the societal cost of carbon emissions but rather to reflect the significant probability of future carbon emission regulations at either the federal and/or state levels. Such costs are utility system costs and therefore should be reflected in the UCT. Conceptually, they could be developed by estimating the cost of compliance with future regulations and applying a probability of application in different years. If a decision is made to not include such cost, they should at least be part of a sensitivity analysis. Note that several states and utilities include avoided carbon emission costs to reflect the value of avoided likely future regulations on carbon emissions. Illinois is but one example.

**Guidehouse Response:** Guidehouse will not forecast avoided costs that are not currently used for utility cost-effectiveness modeling, however, an avoided cost sensitivity analysis to show the relative impact of changes to this variable will be provided.

11. Retail Rates: Footnote 8 for the gas rates links to the same electric rates as Footnote 7. Please update with appropriate reference.



**Guidehouse Response:** Please see updated link - [https://www.michigan.gov/documents/mpsc/gasrates\\_592543\\_7.pdf](https://www.michigan.gov/documents/mpsc/gasrates_592543_7.pdf)

12. Line Losses: Guidehouse states that one utility – Consumers – provided both average and marginal line loss options, but that because others did not it chose to use average loss rates. That does not make sense. It is a basic engineering fact that marginal loss rates will be higher than average loss rates and that both marginal and average loss rates at peak hours will be higher than averages across the whole year. Thus, to use average loss rates is to intentionally understate generation savings and efficiency cost-effectiveness. Why not use the ratio of marginal-to-average for Consumers and apply that ratio to all other service territories (and the same for marginal peak losses)?

**Guidehouse Response:** Guidehouse's approach to the use of line losses is in alignment with utility program cost-effectiveness evaluations. Guidehouse will perform a sensitivity analysis on the results to show the impact of varying line loss percentages on potential.

13. EWR Assumptions Spreadsheet: EndUseAlloc Tab - It appears as if Guidehouse is assuming that end use contributions to system peak demand (kW) are the same as their contributions to total annual electricity consumption (kWh). That is not the case. To use an extreme example, space heating (for which Guidehouse is assuming a 21% contribution to both annual kWh and peak kW for single family homes) will not have any contribution to system peaks which are experienced on hot summer days. Conversely, cooling will represent a much higher portion of peak loads than of annual energy consumption.

**Guidehouse Response:** The DSMSim model does not scale potential based on demand allocations by end use. This duplication in the inputs file will be removed and does not impact potential study results.

14. We are surprised to see electric heat make up a higher fraction of single-family kWh consumption (21%) than for multi-family (18%) given that electric heat is much more prevalent in Michigan in multi-family buildings (see graph above). This does not seem accurate.

**Guidehouse Response:** Guidehouse has reviewed the available data sources and made an update to the global inputs based on that review. However, the multifamily fraction remains slightly lower than the single-family fraction, likely due to the smaller size of multifamily units, and therefore less HVAC consumption relative to other electric end uses.

15. The distribution of end use kWh consumption for low income customers appears to be assumed to be the same as for non-low income. That is not realistic. Low income customers are more likely to have electric heat, electric water heating and electric cooking (lower first cost installations) – especially in multi-family buildings – and less likely to have central air conditioning. Data on prevalence of electric heat

by income can be obtained through analysis of Census data from the American Community Survey (referenced above).

**Guidehouse Response:** Guidehouse completed primary research since the release of the global assumptions memo that included space and water heating fuel type by customer segment. These differences will be reflected in the final model.

16. kWhSales and GasSales tabs: It appears as if the share of low income households is assumed to be the same (about 30% in the lower peninsula for electricity) in single family homes as in multi-family. That is not reasonable. Low income customers are disproportionately more likely to live in multi-family buildings. Again, Census data should show that.

**Guidehouse Response:** Guidehouse has reviewed the available data sources and made an update to the global inputs based on that review.

17. kWhRetailRate tab: How are the retail rates computed? The reference provided in footnote 7 of the memo provides different rates depending on level of monthly consumption – e.g., 250, 500 and 1000 for the residential sector. Which of those values – or combination of values – was used?

**Guidehouse Response:** Guidehouse assumed the mid-value of 500.

18. DiscntRates tab: What is the basis for using the utilities weighted average cost of capital for the TRC test (same as for the UCT)? See the NSPM for EE or the NSPM for DERs. The TRC is arguably closer to a societal test than the UCT and therefore should merit a discount rate closer to the societal rate. What is the basis for having a higher societal discount rate for the UP than for the lower peninsula? They are both part of “society”. Moreover, if these are real rates, it is highly problematic to use 5%. We have never seen a reference to a societal discount rate that is that high. Many utilities using societal discount rates currently reference long-term average yields for U.S. Treasury bonds, which are on the order of 1% real (see the Illinois TRM). The real discount rates shown for most tests – i.e., 6.54% for the LP and 7.19% for the UP (or nominal values of about 8.8% for the LP and 9.4% for UP) – appear unreasonably high. What are they based on? Is it the utilities’ weighted average cost of capital? If so, is it clear to Guidehouse that the values it is using are “real” rather than nominal? In its 2020 rate case Consumers reported a nominal pre-tax weighted average cost of capital of 6.1%. In its 2020 filing of its revised 2021 EWR Plan DTE’s DSMore analyses uses a nominal electric discount rate of 6.63%.

**Guidehouse Response:** The note identifying discount rates as real in the input workbook provided is incorrect. The discount rates provided are nominal.

19. LineLosses tab: See comment above. Loss rates at peak are always higher than average annual loss rates. Assuming they are the same as average annual loss rates is incorrect and understates the value of peak demand reductions.

**Guidehouse Response:** Guidehouse's approach to the use of line losses is in alignment with utility program cost-effectiveness evaluations. Guidehouse will perform a sensitivity analysis on the results to show the impact of varying line loss percentages on potential.

## 5. Rick Morgan

Morgan Marketing Partners

[morgan@morganmp.com](mailto:morgan@morganmp.com)

Email Date: April 30<sup>th</sup>, 2021

### Comments

1. I am aware of a new Market Potential Study being conducted by UPPCO. Within that there are characterizations about the building stock, age, fuel, and other parameters. How was that information used to inform the UP market characterization in your analysis?

**Guidehouse Response:** Guidehouse used the UPPCO Market Characterization Study to help determine fuel splits for the upper and lower peninsulas. However, as these inputs were collected in Guidehouse's primary research, the UPPCO data was used as a secondary source.

2. I am confused as to what definition of Peak was used for the study. On page 2 it says "Guidehouse applied peak factors to electricity sales forecasts, based on the MEMD's peak definition of 3-6pm on the three consecutive hottest weekdays in July" then on page 4 it says "Guidehouse utilized PJM's definition of on vs off peak market price." Could you please clarify? I believe we should be using the MEMD definitions throughout.

**Guidehouse Response:** Peak factors for sales forecasts are applied based on the MEMD definition. This represents system peak consumption and is used to determine potential as a percent of sales. The pricing peak definition applied for economic analysis of measures uses the PJM/MISO market peak pricing definition. These definitions differ as they represent two unique peaks, system vs price.

3. Inflation is at a constant 2.01% for the whole period. Is that realistic?

**Guidehouse Response:** The inflation rate is a weighted average across utilities providing this input in their DSMore files. Guidehouse used this value to align with utility cost-effectiveness evaluation inputs.

4. Discount rates are inconsistent for the Societal Test. The LP is 2.47% while the UP is twice that amount at 5%. Why is there such a large difference? All other discount rates appear reasonable.

**Guidehouse Response:** Guidehouse determined discount rates by cost test from the utility DSMore files to remain consistent with program cost-effectiveness evaluations. Any differences in discount rates between service territories are directly sourced from the DSMore files. Guidehouse is following up to confirm.

## 6. Christopher Payne

DTE

[christopher.payne@dteenergy.com](mailto:christopher.payne@dteenergy.com)

Email Date: April 29<sup>th</sup>, 2021

### Comments

1. DTE EWR Comment:  
Confirmed - T&D avoided cost (\$/kW) should be \$0.

**Guidehouse Response:** Acknowledged.

2. DTE DR Comment:  
On page 3 of 5, Table 2, of the Demand Response PDF (link below) winter months for DTE are shown as October – May. They should be November – March.  
[\[MI 2021 Statewide DR Potential Study Global Data Summary.pdf\]](#)

**Guidehouse Response:** Guidehouse updated winter months definition.