Feedback on Modeling Input Assumptions and Output Metrics Associated with the July 15, 2024 Meeting of the Electric Utility Commission

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Tuttle	Why the disparity in AE load vs. ERCOT talking points about load growth?	In a recent ERCOT CEO update, ERCOT CEO Pablo Vegas shared 2030 projected Regional Transmission Plan (RTP) load using a new methodology (allowed by HB 5066) under which Transmission Service Providers (TSPs) are permitted to include prospective large loads that previously would have been too speculative to have been included in load forecasts. This resulted in an additional 41 GW of large loads contributing to peak system demand by 2030. They include many projects that will likely not be built as well as loads, such as crypto mines and hydrogen electrolyzers, that are highly flexible, meaning they can be incentivized to curtail load during periods of peak demand. Electrification of oil& gas production facilities is also a major component of this larger ERCOT-wide projection. Many of these are load types that would be unlikely to locate within Austin Energy's service territory.
White (Public Citizen)	Total AE CO_2 emissions, Total AE NOx emissions, Total AE SOx emissions, and Total AE PM emissions should all account for upstream emissions as well. This should include fugitive and vented methane (and accompanying pollutants), and fugitive hydrogen emissions. AE should share what fugitive/vented emissions rates they are assuming. The 20-year global warming potential values should be used for these pollutants, as it is now widely accepted by climate scientists that controlling methane and other more potent greenhouses in the near term is essential to avoiding catastrophic climate change.	We interpret this comment to be related to a Life Cycle Assessment (LCA) methodology where the cradle-to-grave impacts of resources are estimated and accounted for when comparing different resource options. We agree with the merits of taking a wider life-cycle lens while recognizing the specialized expertise and time necessary to do so. A relevant and useful LCA would include both an understanding of the upstream and downstream impacts of all technology types using a common framework, as well as options for mitigating those impacts for the resources we invest in. Given the resources and time needed to finalize the Resource Generation Plan by end of calendar year 2024, AE will commit to seeking resources to undertake LCA studies to inform our resource and generation plan implementation.
White (Public Citizen)	The NOx emissions rates for burning hydrogen and a blend of hydrogen and natural gas should be supported by one or	Please see accompanying calculations spreadsheet for AE emission factor calculation methodology, source citations,

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	more reputable studies that can be shared with the EUC, Council and the public. Unlike NOx emissions from burning natural gas alone, emissions rates from burning hydrogen – and especially blended with natural gas – are contested. Some sources point to emissions rates up to 6 times more than from burning natural gas. Other things I've read indicate that it may not be as high as that, but the values don't align. AE should have a solid source to point to and share for these rates. If there is any uncertainty (which seems likely), some buffer, or a range, should be used.	and results. AE is also open to considering other studies of gas/H_2 fuel blends for review and comparison, if those sources are provided.
White (Public Citizen)	Energy burden is very important, but it is just as much a function of rate structure as total operating cost. It's a more relevant metric for a rate case than resource planning. If it is to be used in this process, it should be evaluated under multiple rate structure options.	As part of its response to addressing the community stakeholder feedback that equity should be a key value in driving decision making, AE proposes the use of an "energy burden" calculation as an output metric. This will provide a better understanding of the potentially disproportionate impact that an increase in electricity bills may have on low- and middle-income AE customers, for whom energy costs represent a higher percentage of their overall expenses. Modeling will generate an overall cost for each portfolio which will be used to estimate an average impact to customer bills. An energy burden calculation will go one step further by estimating what that additional cost represents as a percentage of overall costs for a low- to middle-income customer. The evaluation of alternate rate structures is not included in the scope of the Resource Generation Plan process. Quantifying energy burden with static (current) rates provides for comparison between portfolios and options using an accepted, standard measure and provides a way to look at resource plan options through an equity lens. AE welcomes EUC and stakeholder input about other ways to gain equity insights from our modeling efforts and outputs.
Reed (Sierra Club)	Energy burden is a priority concern for the Sierra Club. Our members have participated in and commented on the two most recent rate cases that stood to have large impacts on energy	Please see response above.

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	burden for working class Austinites and communities least able to absorb higher monthly utility bills. While reflecting energy burden in an analysis like this is commendable, it is not the appropriate venue because it assumes rate structures will remain the same over the years modeled. That can distort the impact of any costs and lead to an inaccurate, piecemeal picture provided to decision makers and community stakeholders. If AE wants to model different rate structures as part of the gen plan, we're open to discussing those structures.	
White (Public Citizen)	ERCOT-wide CO_2 emissions should be removed as a metric. There is no reliable way for AE to predict which other generators in ERCOT are going to stay in operation or are going to be available to participate in the market at any given time. Also, the established greenhouse gas reduction goals for AE and the City are focused on AE's generation, not ERCOT, which neither AE nor the City can control. This metric will inherently include messy and unreliable assumptions and calculations and is a distraction from the stated goal of reducing AE emissions.	AE will include **AE-owned CO_2 stack emissions** as an output metric and primary criteria to compare between portfolios. AE plans to include **ERCOT-wide CO_2 stack emissions** as an output metric due to the nature of CO_2 emissions as a global pollutant rather than a local pollutant. The impact on climate change of a ton of CO_2 emitted in another part of the state is no different than a ton of CO_2 emitted near Austin. Modeling results will show differences in total ERCOT-wide CO_2 emissions based on different AE portfolio designs because the size, type and location of new generation will impact the dispatch characteristics of non-AE generating units, and therefore will impact the ERCOT-wide CO_2 emissions. System-wide changes provide an indicator of actual environmental impact, and this is valuable output available from the market-wide model we are using. AE will generate both output metrics in its modeling and present the results for each portfolio during the next phases of this process.
Reed (Sierra Club)	CO_2 emissions should be measured for the AE scale, but we have concerns about the metric for ERCOT wide emissions. If AE wants to compare CO_2 emissions to other generators and electric providers, a more practical comparison would be municipally owned utilities of similar size. CPS Energy is larger, but could provide some useful comparison, for example. ERCOT wide comparisons between now and the end of the modeling period are	Please see response above.

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	volatile and highly likely to change with the implementation of the Texas Energy Fund, EPA clean air rules that will affect coal power plant generation, and other market changes.	
White (Public Citizen)	Total AE SOx emissions and Total AE PM emissions are missing from the output metrics. They should be included.	Model results will include total AE SOx and PM emissions, so these can be included as output metrics. The proposed output metrics focused on CO_2 and NOx emissions as the principal pollutants of concern given the types of candidate technologies under consideration, but SOx and PM can and will be included as well.
White (Public Citizen)	The cost assumptions for wind, solar and batteries appear to be higher than what can be procured (looking at what was shared in the RFP responses presentation). While I understand that some of the proposals from that RFP may not be feasible or beneficial to Austin Energy, unless you've already determined that all of the lower cost proposals are to be discarded, the price assumptions for the modeling seem inflated. This is obviously of critical importance because higher cost assumptions for the primary alternatives to methane gas and hydrogen will unduly tip the scales away from a carbon-free and emissions-free future. In the past, the EUC has received more detailed information on proposals from RFPs – specifically a count of projects and MW in various price ranges (i.e. $30-$34/MWh, $35-$39/MWh, $40-$44/MWh, etc.) for each resource type. Could we please get that more detailed information regarding this recent RFP? This is relevant because if there's only one or two proposals in the lower ranges, then it's more reasonable to think that isn't a realistic price assumption. On the other hand, if there are many, then it's more likely that some of them could be feasible and beneficial to AE.	Some of the very low pricing proposals received as part of the RFP process were not included in the actionable cost range for modeling purposes due to an assessment by the AE review team that the proposals were untenable. The two primary reasons for rejecting those proposals are: 1) the proposed locations of the projects were either in areas where transmission congestion is currently very high or where AE already has a saturation of assets and thus would not gain better portfolio diversification, and/or 2) associated terms & conditions would affect the net value of the proposal as opposed to just the listed $/kW capital cost.
Reed (Sierra Club)	The cost estimates for wind, solar and batteries used in these assumptions are higher than what we anticipate. Please provide more transparency on price ranges for recent RFPs to the EUC – we need to see the number of projects in given dollar/MWh ranges.	Please see response above.

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White (Public Citizen)	Local solar cost assumptions need some clarification and refinement. Given that the VOS changes based on the installed capacity – not whether an installation is residential or commercial – I suggest removing "Local Solar – Residential" and adding "Local Solar – Customer-Sited Less Than 1 MW" and "Local Solar – Customer-Sited 1 MW – less than 10 MW (unless there is a reason for a lower threshold). With those two categories, you can use the two VOS rates as the cost, but that does leave the question of how you are accounting for all the financial benefits from that source. The avoided cost portion of the VOS should be reflected back as a financial benefit.	AE agrees to split out the categories into "Local Solar – Customer-Sited Less Than 1 MW" (VOS = $99/MWh) and "Local Solar – Customer-Sited 1 MW – less than 10 MW" (VOS = $72.40/MWh). The modeling "sees" customer-sited solar as reduced demand, so the avoided cost is reflected in that lower demand, which will lead to lower energy costs, lower transmission-related costs, lower need for local generation buildout, etc.
White (Public Citizen)	Fayette should not be assumed to be running until 2029. No policy change has been made to adopt that date using that date sends a clear signal to the Austin community and LCRA that AE isn't serious about getting the plant shut down in the near-term, as promised multiple times – including in the current Resource Plan. The retirement date should be modeled as January 1, 2025, so that replacement resources are in place whenever an agreement with the LCRA can be reached. If an agreement can't be reached by that date, then AE has more resources to sell into the market.	Austin Energy's plan is to retire our share of FPP as soon as possible. For modeling purposes, AE will include January 1, 2025 and other FPP retirement dates in enough portfolios to demonstrate the relative impact of that variable on model output. The next phase of the generation resource planning process involves designing portfolios that will include various mixes of different technologies as well as different asset retirement date assumptions. These different portfolios will be modeled and tested through several alternative future trajectories (scenarios) and the resulting output metrics will highlight the differences between them.
Reed (Sierra Club)	The current City Council direction regarding the Fayette coal plant calls for a retirement date of no later than January 2025. The modeling should incorporate that target date, as well as other possible retirement dates such as 2026 and 2027, as well as the currently proposed modeling date of 2029.	Please see response above.
White (Public Citizen)	All AE's gas plants should have a 2035 retirement date assumed. That's part of the current Resource Plan. I believe there are one or two smaller plants (Mueller being one) that aren't included in the spreadsheet. The list should be comprehensive.	AE does assume a 1/1/2035 retirement date for the SHEC and Decker gas plants, so this will be added to the Modeling Framework for clarification. AE will add the requested smaller local units.
Reed (Sierra Club)	Modeling should reflect the current Austin Climate Equity Plan goals of net-zero	AE has historically aimed to achieve both the zero stack emissions goal and net-zero

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	carbon emissions no later than 2035. This should include all AE gas generation units.	carbon footprint goal reflected in the City's Climate Equity Plan (net-zero by 2040). We continue to aim to find solutions for both of these climate goals in our resource and generation plan efforts.
White (Public Citizen)	The gas plants should also be assumed to be utilizing the REACH strategy, since that is also part of the current Resource Plan.	Austin Energy can design a portfolio that includes REACH for existing gas generation units. Portfolio design is the next stage of this process. We are currently focused on modeling input assumptions and output metrics.
Reed (Sierra Club)	We need to include extending the REACH program to gas plant generation in these models, especially after Fayette is retired – this is a goal in the current AE resource plan.	Please see response above.
Alvarez	As the plants (PPAs) go offline, what assumptions are made about what we're replacing them with Are these PPAs? What is the typical contract duration?	AE factors in the contract end date for existing power purchase agreements (PPAs) when designing portfolios to be modeled as part of the Resource and Generation Planning process. One or more of the future portfolios to be modeled is expected to include replacement of renewable energy in differing amounts, depending on portfolio design. AE will present the proposed set of portfolios for discussion in August.
Chapman	Can Webber Energy Group study data be made available to EUC?	The AE energy and load growth forecasts provided in the Modeling Framework spreadsheet are taken directly from the Webber Energy Group study. Dr. Webber presented at the 7/16 Utility Oversight Committee (UOC) meeting and the full slide deck as well as recording of the meeting is available to the public. These are the only deliverables in hand at this stage of the Webber Energy Group work.
Reed	First I do think the local solar projections seem rather modest particularly the "other local solar" as opposed to customer-sited. I am assuming this would be projects similar to webberville that would be near substations or perhaps on sites like landfills. I understand land is very valuable in Travis and it is unlikely it pencils out in most cases but going from only 34 to 42 MWs seems very low to me. Perhaps this is meant as a starting business as usual case.	The "Customer-Sited Solar" and "Other Local Solar" growth projections are indeed based on business-as-usual forecasts for base modeling. Any additional local solar will be included as part of the portfolios to be presented to the EUC in the August meeting and will be informed by the market potential study expected from DNV in the coming weeks. The "Other Local Solar" category does represent Community Solar projects similar to Webberville.

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Reed	Second, I get that for energy efficiency you are showing the cumulative peak demand reduction from EE programs as we have been doing, but we may want to also consider how energy efficiency lowers overall energy use. In addition to our peak demand reduction goal we currently have a energy savings goal of one percent so I would hope in modeling you would also consider how EE and DR can be used to lower energy use at different points in time - overall but also in summer and winter peak. I assume again you are showing assumptions if we spend a similar amount in the future on EE and DR as we do today as opposed to a more aggressive scenario.	When annual MW energy efficiency projections are added to the models, they are incorporated into an 8,760 hour annual load shape, effectively reducing both total peak demand and total energy consumption across each hour of the year according to the type of energy efficiency measure. For example, a weatherization program will show efficiency improvements (load reduction) more evenly spread across the year compared with a demand response program that targets peak demand at only certain times during the day and at different times of the day depending on time of year. The energy efficiency and DR impacts do address winter peaks in the modeling as well. Energy efficiency and DR projections provided in model inputs are base case business-as-usual forecasts and additional EE/DR savings will be included as part of portfolios for modeling.
Rhodes	For the 100-hour storage that is limited to 13 cycles, what defines a cycle for that technology? Do part cycles count?	The annual limit of 13 cycles is based on a total MWh discharge limit of 32,500 MWh/year (25 MW/2,500MWh unit x 13 full cycles = 32,500 MWh). The unit can have more than 13 (partial) cycles as long as it stays under the total annual limit of 32,500 MWh/year.
Rhodes	It looks like the Technology Cost table is sparse, is there a reason why the capital costs for solar and storage technologies isn't filled in?	For technologies where AE anticipates signing PPAs with 3rd parties instead of owning the assets, the costs provided reflect the anticipated PPA costs to AE. This is the case for utility-scale wind and solar outside the AE load zone and for battery storage projects where AE anticipates a contractual arrangement with a 3rd party to pay a capacity payment for rights to use the battery capacity. For local solar, AE uses the new "Value of Solar" program for cost assumptions as a 3rd party installs and owns the equipment and AE pays for the electricity generated.
Rhodes	For the emissions factors, it looks like the Sand Hill combined cycle plant has the same emissions factors as the combustion turbines, can you provide those in lbs-CO2/MWh so we can see the difference?	Sand Hill Unit 5 (Combined Cycle) = 872 lb/MWh Sand Hill CTs (avg) = 1,140 lb/MWh

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Rhodes	Can the outputs provide emissions, such as NOx, by location — that is for existing assets and where new ones are placed? Also, why just NOx, what about SOx and PM?	The UPLAN model outputs will include total emissions by unit for all units across ERCOT based on how many hours that unit is dispatched in the model run. The model outputs can show emissions by type and by location for both new and existing units. NOx is included as an output metric to be used in evaluation of portfolios due to the type of candidate technologies proposed and the potential local air quality and permitting implications related to NOx emissions. Total SOx and PM emissions will also be calculated in the model and will be added as output metrics.