Appendix A

COMMENTS OF THE COUNCIL FOR THE NEW ENERGY ECONOMICS REGARDING EVERGY'S INTEGRATED RESOURCE PLAN STAKEHOLDER MEETING ON DECEMBER 18, 2020

Submitted December 31, 2020

The Council for the New Energy Economics ("NEE") appreciates the opportunity to provide comments regarding Evergy's stakeholder workshop held on December 18, 2020, as part of the integrated resource planning ("IRP") process established by the Kansas Corporation Commission ("KCC" or "Commission") in Docket No. 19-KCPE-096-CPL. The established IRP framework allows stakeholders to comment on presentations from Evergy. NEE believes this framework helps facilitate a collaborative stakeholder process for an IRP.

A. Brief Introduction

Energy Futures Group ("EFG") provides NEE's analytical modeling services in this IRP. EFG has deep experience participating in state IRP regulatory proceedings. For example, Anna Sommer, principal at EFG, has provided expert testimony in front of utility commissions in Michigan, Minnesota, Montana, New Mexico, North Carolina, Puerto Rico, South Carolina, and South Dakota. EFG's experience includes capacity expansion and production cost modeling, scenario and sensitivity construction, modeling of supply and demand resources, and review of forecast inputs, such as fuel prices, wholesale market prices, and load forecasts. EFG also has experience reviewing modeling performed using numerous models including Aurora, Capacity Expansion Model, EnCompass, PLEXOS, PowerSimm, PROSYM, PROMOD, SERVM, Strategist, and System Optimizer.

B. Transparency

Based on our experience, the best results come from a collaborative process between the utility and stakeholders. Proprietary information that is not shared early with stakeholders that have signed non-disclosure agreements ("NDAs") may preclude significantly better outcomes for

ratepayers and shareholders. Economic decisions involving billions of dollars made on behalf of customers, shareholders and other impacted stakeholders should be based on shared and vetted data.

Not only is transparency the foundation of stakeholder participation in IRP workshops, but it is also necessary for the Commission's ability to render informed decisions. In order to ensure full transparency, Evergy should provide stakeholders with all modeling inputs[1] as well as the underlying documentation for those inputs. Sharing this information now would be more efficient and allow stakeholders to provide much more meaningful feedback, thereby potentially improving the IRP filing. Stakeholder participation can add substantial value by weighing-in in a collaborative, solution-oriented manner on methodologies, key inputs and assumptions. It could ultimately improve the quality of the modeling effort, thereby improving the IRP preferred portfolio recommendations. In addition, it is much easier to rectify concerns about inputs now rather than after the modeling has been completed and the IRP filed. NEE understands the delicate nature of confidential and proprietary information, but if stakeholders have signed an NDA, then they should be able to access this information. Given the importance of transparency to creating value during the entire IRP process it is important this be addressed now.

C. MIDAS Model

The modeling approach for this IRP process diverges from the manner in which most utilities conduct modeling for an IRP. Evergy is developing fixed portfolios of new resource alternatives and then simulating the dispatch of those new resources, along with existing units, in

[1] Examples of modeling inputs include the capital costs, variable and fixed O&M for all new supply side resources (owned and PPAs); underlying cost and savings inputs for DSM resources, including the Market Potential Study; forecast inputs including load, behind the meter solar and battery, electric vehicle, fuel, CO_2, and market price forecasts.

a production cost model[2] called MIDAS. It is NEE's understanding that MIDAS is only capable of performing hourly chronological dispatch of the system's generating assets and does not perform capacity expansion modeling. This means that portfolios are created without the benefit of an optimization modeling tool.[3] The vast majority of utilities of Evergy's size conducting IRP modeling use a model that can economically select resources to create an optimal, economic mix of new resource additions. The models frequently used for IRPs are capable of performing both economic selection of a resource portfolio and then subsequently performing an 8760 hourly dispatch of that portfolio, commonly referred to as capacity expansion optimization. For a number of reasons, an optimization approach is far more preferable than using MIDAS to dispatch pre-determined fixed portfolios. First, it is much more time consuming to construct portfolios by hand. Second, it is difficult for a modeler to manually create portfolios that are truly optimal. It would take significant iteration to develop portfolios that aren't overbuilt with respect to the reserve margin, that add new resources by type and timing in an optimal manner, or fairly evaluate the impact of acquiring more of a modular resource, e.g., energy efficiency, or the need to acquire other resources. In addition, the current approach using MIDAS makes it difficult, perhaps even impossible, to fully evaluate how certain model inputs (such as fuel or CO_2 prices) impact the selection of new resources or optimize retirements of existing units. For comparison, models that perform capacity expansion optimization allow stakeholders and decision-makers to utilize a

[2] A production cost model is used to determine how individual generators will dispatch into the electricity grid. Production cost models usually simulate this dispatch on an hourly basis over the planning period. In comparison, other models, are used for both capacity expansion and production cost modeling. Once the model determines the optimal resource mix in the capacity expansion plan, it then dispatches those new resources, along with the utilities' existing resources, in a production cost run. That run simulates hourly dispatch over the planning period.

[3] Sometimes the MIDAS name is used somewhat interchangeably with a legacy version of a model called "Capacity Expansion Model". CEM can optimize a resource portfolio but only if the system is currently in a position of deficit, otherwise an artificially high reserve margin has to be used before the model will create an "optimal" portfolio. This would be another reason not to use MIDAS for resource optimization even if it is theoretically capable of doing so.

model that is capable of performing capacity expansion optimization and production costing, which is important for evaluating and determining the optimal mix of a resources at the lowest cost.

NEE is also concerned that MIDAS is an out-of-date model not capable of performing the types of simulations necessary to evaluate all the resources that are currently available for optimal economic benefit. For example, legacy production costing models like MIDAS oftentimes cannot represent solar hybrid resources. This is for one or more reasons. One is that the model was not designed to simulate batteries, since batteries in these models are often represented as pumped storage facilities which can have limitations such as an inability to charge and discharge based on economics (instead it must use a charge/discharge profile created by the modeler). Thus, available capacity and savings from batteries cannot be adequately evaluated. Additionally, most legacy production costing models cannot represent the initial five-year period[4] during which a hybrid battery must be charged by the solar farm to which it is connected simply because the model has no setting to allow for that configuration. With more up-to-date modeling software, solar hybrid resources are being evaluated in other states' IRPs, and if adequately considered, could demonstrate economic benefit in Kansas. In addition, it is our understanding that the vendor of MIDAS, ABB, no longer supports the software. Indeed, several utilities that previously used MIDAS (Ameren Missouri[5] and Indianapolis Power & Light) have moved to other modeling platforms in their recent IRP filings.

With the Missouri filing date so close, NEE believes it is would not be possible for Evergy to switch to a model that is capable of performing both capacity expansion and production cost

[4] In order for the battery to receive the Investment Tax Credit, it must be charged by the solar resource it is paired with for the first 5 years of the life of the project. After the five-year period, the battery no longer has to be charged by the solar resource and can instead be charged by electricity from the grid.
[5] See pdf page 31 of https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935874877

modeling, allowing an economic evaluation of resource portfolios. As outlined above, NEE has concerns about the use of portfolios developed outside of a capacity expansion model that are then dispatched in a production cost model. As a result of these concerns, NEE recommends that Evergy start the search for a model replacement sooner rather than later. In the search for a replacement model, it is crucial to utilize a collaborative stakeholder process. When utilities in Minnesota needed to select a new IRP model to replace Strategist and System Optimizer, they engaged in a model selection process[6] with stakeholder groups that allowed the utilities and stakeholders to vet modeling platforms they learned about through a Request for Information ("RFI"). Through the input of the group, the number of model vendors was narrowed down to four final candidates. Those candidates were asked to provide presentations and Q&A sessions with the parties involved in the RFI process. In addition, each utility test "drove" the top two software packages before making the final decision based on the utility's individual needs.[7] DTE Energy recently conducted a similar process that was very well received and helped create buy-in to DTE's model choice. NEE strongly encourages Evergy to select a new model to conduct its IRP process, utilizing an approach similar to those conducted in Minnesota and Michigan.

D. Retirement Dates for Coal Plants

As explained, it is NEE's understanding that the MIDAS model only includes production cost modeling and not capacity expansion optimization. As a result, Evergy creates its own selection of new resources according to a pre-determined coal plant retirement schedule of the plan being evaluated. This limits the possibility of capacity expansion optimization and the ability to

[6] Minnesota utilities including Xcel Energy, Minnesota Power, Otter Tail Power, and Great River Energy engaged in a joint Request for Information process with Commission staff, the consumer advocate, and environmental intervenors. The RFI process allowed these parties to evaluate and vet model alternatives as a group. The selection of the final software package was made by each utility.
[7] All four Minnesota utilities ultimately chose to license Anchor Power Solutions' EnCompass software.

evaluate the retirement of existing units and replacing the capacity of those units with new resources that are economically favorable, with potential fuel and CO_2 cost reductions, if the replacement resources include renewables. NEE understands that the base case plan modeled by Evergy assumes the retirement schedule currently reflected in rates. Thus, an optimized comparison of earlier retirement dates and the accompanying potential economic benefits is not included. Such valuable information for decision-making should be included in an IRP. It is unclear to NEE how the alternative retirement dates modeled under the different plans are chosen. It appears the MIDAS model is not performing a neutral economic analysis. NEE recommends that Evergy provide additional information to stakeholders regarding those factors influencing the alternative, selected retirement dates for the coal plants. It is not clear to NEE if the retirement dates are being driven by planned capital expenditures, or if there are other factors influencing the modeled retirement dates. Understanding those factors may help all stakeholders evaluate potentially avoidable, large capital expenditures and savings available from earlier retirements.

E. Application of Endpoint Probabilities to Uncertain Factors

Evergy's proposed methodology for evaluating and ranking alternative resource plans includes assessing the Net Present Value of Revenue Requirement ("NPVRR") results for individual scenarios in addition to the "expected" value of the NPVRR across all scenarios. The expected value of NPVRR approach includes applying an endpoint probability for several different critical factors. Evergy has identified the load forecast, natural gas and CO_2 prices as critical factors for this IRP update. Each of these critical factors will be assigned a probability associated for the high, mid, and low cases. Endpoint probabilities of 25% for high, 50% for mid, and 25% for the low cases were assigned.[8] For example, in a scenario with high load growth, high natural gas price,

[8] Slide 19 from December 18th, 2020 Evergy IRP Stakeholder Meeting.

and a high CO_2 price, that scenario will have an endpoint probability of 1.6%, which is derived by taking the product of the endpoint probabilities, or .25 x .25 x .25. It is NEE's understanding that the expected value of NPVRR is calculated by taking the average of all resulting NPVRRs weighted by their "probability". We understand the desire to synthesize the results of all the different scenarios, but we do not believe that this approach is a sound one. First, it appears the endpoint probabilities may be determined subjectively for two of the three critical factors (CO_2 and gas prices). For that reason alone, it's not clear why assigning probabilities would provide additional, helpful information. Moreover, it may be helpful to evaluate why certain of these factors would occur together. For example, for the December 18, 2020 presentation, the modeling assigns all high cases at 25% probability and all low cases at 25% probability of happening. Instead of using this endpoint probability approach, NEE recommends that Evergy model a smaller number of internally consistent scenarios and then compare the NPVRR of the portfolios evaluated under those scenarios. Sensitivities can then be performed to isolate and understand single assumption changes, e.g., a change in capital cost expectations, a change in load, etc. This approach is much more consistent with that of other utilities.

F. Inclusion of Additional Resource Alternatives

During the stakeholder meeting held on December 18, 2020, Evergy discussed preliminary modeling results and indicated that future modeling iterations will evaluate new resource additions that include wind, battery storage, and higher levels of Demand Side Management ("DSM"). The alternative resource plans presented during the December 18, 2020 meeting only included a mixture of solar, combined cycles, combustion turbines, and two levels of DSM. In order to ensure a balanced and economic mix of resources, it will be crucial to evaluate resource plans that also consider solar, wind, battery storage, and hybrid resource alternatives. While Evergy seemed

hesitant to model hybrid resources when it was discussed during the stakeholder meeting, NEE strongly believes hybrid resources ought to be included in the evaluation of new resources given the tax benefits gained, and the fact that utilities across a wide range of geographies are acquiring thousands of megawatts of hybrid capacity. Neutral data-based, optimization modeling in those jurisdictions indicates there are economic benefits. NEE would be happy to supply the inputs needed to represent these resources, assuming they can be modeled in MIDAS.

G. Conclusion

NEE appreciates the opportunity to work collaboratively with Evergy and stakeholders. In order to ensure that the process yields the best collaborative outcome, it is crucial for all modeling inputs to be made available for stakeholders to review and provide comments. NEE looks forward to sharing additional comments and engaging in constructive dialogue throughout this IRP process.