Joint Review of Kentucky Power's 2019 Integrated Resource Plan Docket No. 2019-00443

Attorney General for the Commonwealth of Kentucky, By and Through the Office of Rate Intervention, & Kentucky Industrial Utility Customers, Inc.

February 25, 2021

Executive Summary

The Attorney General for the Commonwealth of Kentucky, by and through the Office of Rate Intervention ("AG"), and the Kentucky Industrial Utility Customers, Inc. ("KIUC") [hereinafter jointly referred to as "AG/KIUC"], with the assistance of J. Kennedy and Associates, Inc. ("Kennedy and Associates"), provide these Joint Comments regarding Kentucky Power Company's (also referred to as "Company" or "Kentucky Power") 2019 Integrated Resource Plan ("2019 IRP") that was filed on December 20, 2019. KIUC is an association of large energy-intensive utility customers, and its member Catlettsburg Refining LLC, which is a subsidiary of Marathon Petroleum LP, is actively participating in this docket.

The Kentucky Public Service Commission ("Commission") originally scheduled a public hearing for October 6, 2020 and written comments for October 21, 2020. However, on September 15, 2020, the Commission canceled the hearing and on September 23, it held the procedural schedule in abeyance for further consideration of scheduling issues. On November 2, 2020, the Company conducted a technical conference in which it reviewed its IRP process, and provided a demonstration of its Plexos LTPlan ("Plexos") modeling. The Commission ultimately rescheduled and held the public hearing on December 10, 2020. On December 11, the Commission ordered Staff to issue its report ("Staff's Report") on February 15, 2021 summarizing its review of the Company's 2019 IRP and offering recommendations to the Company for subsequent IRP filings. Finally, the Commission set February 25, 2021 as the date other parties could file comments regarding the Company's 2019 IRP or Staff's Report. These Comments represent a focused review of Kentucky Power's 2019 IRP Report, its modeling results, and other discovery responses. These Comments also include discussion of some aspects of Staff's Report.

807 KAR 5:058 at Section 8 establishes that the purpose of an IRP is to meet forecasted electricity requirements at the "lowest possible cost," providing:

> The plan shall include the utility's resource assessment and acquisition plan for providing an adequate and reliable supply of electricity to meet forecasted electricity requirements at the lowest possible cost. The plan shall consider the potential impacts of selected, key uncertainties and shall include assessment of potentially cost-effective resource options available to the utility.

The Company's proposed Preferred Plan limits the selection of certain resources, specifically bilateral market purchases that could result in lower costs to customers, as the Company prioritizes investment in new capital-intensive resources. Kentucky Power has chosen a resource plan that is more expensive, less flexible, and more capital-intensive than other options. The Company also stands to receive financial benefits from the rate base investments that would result from the Preferred Plan. AG/KIUC provide an alternate proposal that would result in lower costs to consumers and would provide greater flexibility as the Company navigates a highly uncertain future. Relying exclusively on the Company's input assumptions, AG/KIUC's alternative plan would save consumers $53 million (net present value) over the period 2020-2034. This is not an insignificant amount for a small utility, as adding market purchases represents a savings of almost 30% compared to the cost of adding solar resources. The AG/KIUC revised plan would extend market purchases beyond 2023 and eliminate the planned solar resources added through 2030.

Review of Kentucky Power's 2019 IRP

Kentucky Power's 2019 IRP projects that over the next 15-year period, its service territory will *annually* see a population decline of 0.1% and non-farm employment growth will be relatively flat. As a result, the Company projects that energy requirements will remain flat and winter peak demand will decline at an annual rate of 0.2% through 2034. The Company's summer and winter peak demand in 2020 and 2034 are projected to be:

Table 1
Summer and Winter Peak Demand and Growth Rates

	Summer Peak (MW)	Winter Peak (MW)
2020	1,012	1,303
2034	1017	1,263
Compound average growth rate	0.0%	-0.2%

The Company's existing resources include the following:[1]

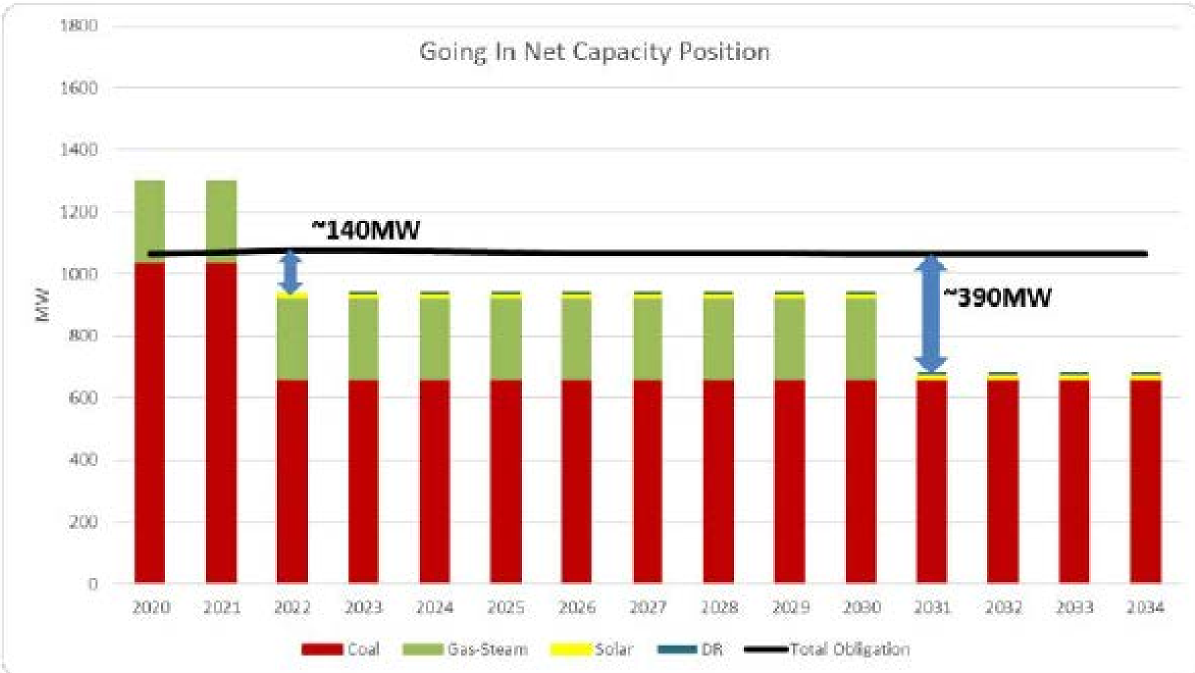
Table 2
Generating Unit Ratings

[1] KIUC 1-2.

Unit	Type	ICAP Rating (MW)	Cum ICAP Capacity (MW)	UCAP Rating (MW)	Cum UCAP Capacity (MW)
Big Sandy 1	Gas-Fired Steam Turbine	280	280	262	262
Mitchell 1	Coal	385	665	306	568
Mitchell 2	Coal	395	1060	357	925
Rockport 1	Coal	197	1257	188	1113
Rockport 2	Coal	195	1452	189	1302
Mitchell capacity represents KPCO's 50% ownership stake. Rockport capacity represents KPCo's 15% purchased share of the units.					

In its analyses, Kentucky Power assumed that the Rockport UPA will not be renewed after it expires at the end of 2022. This results in Kentucky Power having a need for capacity of approximately 140 MW between 2022 and 2030. The Company also assumed that Big Sandy 1 will retire in 2031, which then results in a need for an additional 250 MW of capacity beginning in 2031 and each year thereafter. The Company provided Figure ES-1 in its IRP Report, which is reproduced here for convenience, demonstrating the Company's need for capacity during the fifteen-year planning horizon.

Figure 1
Kentucky Power IRP Figure ES-1



Based on modeling analyses that were conducted using the Plexos optimization model, the Company derived a Base Case expansion plan containing an optimal set of resources that satisfied its resource requirements. The Company then adjusted its Base Plan and presented a new resource plan that it proposes as its Preferred IRP Resource Plan ("Preferred Plan"). The proposed Preferred Plan contains a set of new resource additions that are separately identified in the following load and resource table.

Table 3
Kentucky Power Load and Resource Table Including New Resource Additions

2019 Kentucky Power Preferred Portfolio	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Planning Peak Load (MW)	978	983	989	989	986	984	981	980	979	979	978	978	978	978	979
Planning Reserves (MW)	87	87	88	88	87	87	87	87	87	87	87	87	87	87	87
Required Generation Capacity (MW)	1,066	1,070	1,076	1,077	1,074	1,071	1,068	1,067	1,066	1,066	1,065	1,065	1,065	1,065	1,066
Exist Resources + 10 MW Solar Addition	1,302	1,302	935	935	935	935	935	935	935	935	935	673	673	673	673
Residential + Commercial DSM	0	0	2	4	6	5	5	4	4	3	3	3	3	2	2
Distributed Solar	0	0	0	1	6	6	6	6	6	7	7	11	11	12	12
PPA Capacity	0	0	150	100	0	0	0	0	0	0	0	0	0	0	0
New Solar	0	0	0	52	129	129	129	129	129	129	129	233	233	233	233
New Wind	0	0	0	0	0	0	0	0	12	12	25	25	25	25	25
New CT	0	0	0	0	0	0	0	0	0	0	0	122	122	122	122
Sum of Generating Capacity (MW)	1,302	1,302	1,087	1,092	1,076	1,075	1,075	1,075	1,087	1,086	1,099	1,066	1,066	1,066	1,066
Reserve Margin (%)	33.1	32.5	10.0	10.4	9.1	9.3	9.5	9.7	11.0	10.9	12.4	9.0	9.0	9.0	8.9

To create the Preferred Plan shown in Table 3 above, the Company adjusted the Base Case Expansion Plan by deferring some of the optimally selected wind resources from the 2023 timeframe until 2028, by accelerating some solar resource additions, and by including additional distributed solar and conservation voltage reduction resources.

The new expansion plan includes a 122 MW aeroderivative combustion turbine unit, solar that has an equivalent capacity value of 233 MW, and wind that has an equivalent capacity value of 25 MW. Because wind and solar resources are intermittent, the Company has to install considerably more nameplate renewable capacity to achieve an equivalent amount of capacity as provided by conventional resources. In other words, to achieve 233 MW of equivalent solar capacity and 25 MW of equivalent wind capacity, the Company actually has to install 455 MW of nameplate solar capacity, and 200 MW of nameplate wind capacity, respectively.

<u>Concerns With Kentucky Power's 2019 IRP</u>

A. <u>Market Purchases</u>

1. Kentucky Power Should Have Considered Market Purchases for More Than Two Years

AG/KIUC's primary concern relates to the limitations the Company placed on the possible acquisition of short-term market purchase ("MP") capacity. MP resource options were made available to the model for possible selection as part of the development of the optimal plans using the Plexos optimization model. The Company assumed that it could purchase capacity contracts of up to 1,000 MW with a contract term of one year. These resource options were essentially only available for selection in the years 2022 and 2023. The Company derived the MP capacity prices based on fundamental power price modeling it performed using its Aurora production cost model. The Company further explained how it derived the market capacity prices as follows:[2]

> Capacity prices represent the non-energy revenue necessary for the least-dispatched units to remain economically viable and for the entire fleet to meet required reserve margins. The Capacity Values are bounded by an assumed minimum of $25 and the cost of new entry (CONE), currently defined as the cost of a new combustion turbine. It would be reasonable to infer that low capacity prices mean that the model is long in generation and that new generation is not required to maintain reserve margins. Similarly, an increase in capacity prices would indicate that new generation is required to meet reserve margins.

The Company stated the purpose of the market capacity resource was to allow the model the option to include a short-term capacity commitment as opposed to building a long-term capacity resource,[3] and therefore, the Company only allowed Plexos to be able to select the MP option for the period of 2020 to 2024. As can be seen from Table 3 above, essentially that decision limited the MP option to only be available for two calendar years, 2022 and 2023, as the Company has no need for capacity until 2022. The Company's decision that limited the selection of market purchases to just two years appears to have been quite arbitrary, particularly when the Company's objective was to allow for a short-term capacity commitment as opposed to building resources that would last over the long-term of twenty, thirty years, or more. It would have been more appropriate for the Company to have allowed MPs to have been selected through the eight year period of 2022 to 2030. It is not unusual for utilities to enter into relatively short-term power purchase agreements of between five and ten years.

From a reliability standpoint, it would be unreasonable for the Company to argue that it prefers steel in the ground in the form of solar resources as opposed to acquiring MPs, as the Company's Preferred Plan already assumes it will acquire up to 150 MWs of MPs in 2022 and 2023. Further, it would also be unreasonable to prefer solar resources to MPs as solar resources

[2] 2019 IRP at 82.
[3] Id. at 99.

are intermittent and provide a fraction of the capacity value (51%) of other resources and provide virtually no capacity value during the winter season of the year. By 2024, when MPs can no longer be acquired based on the Company's arbitrary assumption, and when new resources have to be added to fill the gap vacated by the market capacity purchases, the Company decides to add up to 233 MW of nameplate intermittent solar capacity just to achieve the same reliability value as it had achieved by adding an average of 125 MW of MPs.

Because of its heavily discounted capacity value, solar is a risky economic choice to meet a capacity deficit. For this analysis, Kentucky Power assumed that only 51% of the solar nameplate capacity could be counted. However, in its recently filed Mitchell CCR/ELG Application (Case No. 2021-00004), Kentucky Power assumed only a 40% capacity value for solar. That single change would increase the cost of solar capacity in this IRP by 21.5%. Furthermore, Kentucky Power assumed a 24% capacity factor for its solar resource option, which may not be achievable everywhere throughout Kentucky.[4]

There is another reason that allowing MPs for five to ten years makes sense, which relates to the flexibility that they provide. Given that Kentucky is still experiencing the severe economic effects of COVID-19, and in light of the fact that it is highly uncertain whether CO_2 regulations will be implemented anytime soon, it only makes sense to build-in maximum flexibility to allow the Company to be able to adapt quickly to changing conditions. There is no guarantee what form federal CO_2 policies will take and no certainty that CO_2 policies will be approved any time soon. This is not to suggest that some form of a carbon policy will never be implemented, just that it is unclear when that may occur, and what type of policy might ultimately be implemented. Again, for this reason, maximum flexibility makes sense.

In response to stakeholder requests, the Company conducted sensitivity analyses that addressed certain stakeholder concerns. With regard to MPs, the Company was requested to permit MPs to be selected through 2030 (KIUC's Stakeholder Request). However, the Company refused to perform that Sensitivity as requested, and instead only allowed MPs to be added in one

[4] Experience-based data demonstrates that the actual capacity factor for solar in Kentucky has been lower than the Company's assumption (e.g. for calendar year 2017, the capacity factor at LG&E-KU's Brown Solar facility was only 19.8%.) Source: LG&E-KU IRP, Case No. 2018-00348, Vol. 3 at 11.

more year, 2024. The Company found the case with additional MPs was the least cost plan compared to the other stakeholder sensitivities analyzed, though it found that case was less economic compared to the Company's Base Case Expansion Plan.

There are two considerations that should be kept in mind in comparing the Company's Base Case results to KIUC's Stakeholder Sensitivity. First, the Company ultimately did not select the Base Case Expansion Plan as its Preferred Plan, but instead selected a higher cost plan that included additional solar resources acquired earlier in the study period. Selecting a resource plan that is higher in cost than the optimally determined resource plan is not necessarily unreasonable, as utilities often select higher cost resource plans that offer other desirable features. In that regard, there is another important criterion that is often considered in selecting a resource plan, and that is flexibility. The inclusion of additional MPs would offer the Company maximum flexibility to be able to adapt to changing conditions over the next few years.

Second, the analysis the Company performed regarding additional MPs was not a fair evaluation of MPs as requested by KIUC. The Company only allowed MPs to be added in one more year, 2024, and even still, the results appear to be promising not just under the Base Case fuel and CO_2 assumptions, but also under the low fuel and CO_2 scenarios in which the MP Sensitivity, in fact, demonstrated the lowest overall costs on a Cumulative Present Worth basis (Kentucky Power 2019 IRP Figure 42). This is further evidence that the Company should adjust its Preferred Plan to include additional MPs, and it should not be overlooked that we have been in a low-cost environment for more than ten years with no indication this will change any time soon. Even if a CO_2 policy does go into effect, a flexible plan with MPs will allow the Company to adapt quickly to any future policies that are implemented.

2. AG/KIUC Analysis of Additional MPs

AG/KIUC performed an analysis to determine the benefit of replacing the two solar resource additions (101 MW nameplate, 52 MW firm)[5] that are included in the Company's Preferred Plan in 2023 and 2024 with an equivalent amount of MPs. Since the Company assumed the capacity value of solar is 51.1%, only 52 MW of MPs had to be acquired in 2023, and another 52 MWs had

[5] 2019 IRP, Table 17 at 128.

to be acquired in 2024 as the replacement resources. Without having the Company's production cost models, a reasonable spreadsheet analysis was performed that compared the cost of including the solar resources in the Company's resource plan versus the cost of replacing that capacity with an equivalent amount of MP capacity and energy.

The analysis was performed to determine the benefits of replacing the solar resources with the MPs over the 2020 through 2034 study period, and the cumulative present worth of revenue requirement difference is the ultimate result of the analysis. All of AG/KIUC's assumptions in the analysis including the solar capacity value,[6] solar capacity factor,[7] solar cost,[8] and market capacity[9] and energy cost[10] were derived from the Company's own assumptions that it used in its Plexos analysis. Table 4 provides the results that were derived.

[6] Id. at 102
[7] Id. at 101
[8] Id. Solar Resource Pricing Graph, Tier 1 LCOE, at 102, KIUC 1-11.
[9] Id. at 4
[4] Id. On-Peak Energy Prices at 4

Table 4
Solar vs. Market Purchase Cost Comparison

Using 2019 IRP Commodity Price Forecasts													
	Solar Cost					Market Energy Cost		Market Capacity Cost				Total Market	Net Savings
Year	Capacity (Nameplate)	Solar Energy	Capacity Factor	Solar Energy Cost	Solar Total Cost	Market Energy Price	Energy Cost	Capacity Price	ELCC Tier 1	Equiv Cap Purch	Capacity Cost	Market Cap + Eng Cost	Market Purchase vs Solar Cost
	(MW)	(GWh)	(%)	($/MWh)	($M)	($/MWh)	($M)	($/MW-Day)	(%)	(MW)	($M)	($M)	($M)
2020					$0	$29.67	$0	$82.69			$0	$0	$0
2021				$57.02	$0	$29.24	$0	$106.68			$0	$0	$0
2022				$52.96	$0	$29.70	$0	$80.51			$0	$0	$0
2023	101	212.34	24.0%	$52.21	$11	$30.35	$6	$73.93	51.1%	52	$1	$8	$3
2024	253	533.36	24.0%	$57.81	$31	$31.04	$17	$68.16	51.1%	126	$3	$20	$11
2025	253	531.91	24.0%	$56.83	$30	$31.46	$17	$63.22	51.1%	126	$3	$20	$11
2026	253	531.91	24.0%	$57.26	$30	$31.79	$17	$59.09	51.1%	126	$3	$20	$11
2027	253	531.91	24.0%	$56.18	$30	$32.41	$17	$55.79	51.1%	126	$3	$20	$10
2028	253	533.36	24.0%	$56.59	$30	$39.09	$21	$53.29	51.1%	126	$2	$23	$7
2029	253	531.91	24.0%	$55.95	$30	$38.57	$21	$51.62	51.1%	126	$2	$23	$7
2030	253	531.91	24.0%	$55.25	$29	$38.68	$21	$50.78	51.1%	126	$2	$23	$6
2031	253	531.91	24.0%	$58.50	$31	$38.62	$21	$50.75	51.1%	126	$2	$23	$8
2032	253	533.36	24.0%	$59.09	$32	$39.12	$21	$51.54	51.1%	126	$2	$23	$8
2033	253	531.91	24.0%	$59.68	$32	$39.23	$21	$53.15	51.1%	126	$2	$23	$8
2034	253	531.91	24.0%	$60.27	$32	$39.41	$21	$55.58	51.1%	126	$3	$24	$9
Present Worth					$181		$112				$16	$128	$53

The result is a positive $53 million (net present value), which means it is more economic to acquire MPs than to acquire solar resources. This represents nearly a 30% savings compared to the cost of acquiring the solar resources. AG/KIUC recommend that the Company be required to revise its Preferred Plan to extend market purchases beyond 2023 and eliminate the planned solar resources added through 2030. This plan will be less costly based on the Company's own data, and will provide additional flexibility as the Company moves forward.

B. The Commission Should Review Kentucky Power's Proposed Wind Power Additions with Extreme Caution

The capacity factor of any potential Kentucky-based wind facility is poor, and would therefore not be cost effective. The Company overstates the assumed capacity factor of potential wind resources in Kentucky. The Preferred Plan's selection of 200 MW of wind power is broken into two separate tranches of 100 MW each, one block with a capacity factor of 37% and the other block at a 35% capacity factor.[11] According to the National Renewable Energy Laboratory, onshore capacity factor in most eastern states is below 30%.[12] In fact, only two small areas of Kentucky are capable of supporting wind generation at capacity factors in the range of 25% - 30%.[13] Additionally, as of 2019 only one wind generation facility was located anywhere near Kentucky, in this case a 27 MW facility located near the Kentucky-Tennessee border, having a 16.1% capacity factor.[14] The next closest facility was located in central West Virginia, a 100 MW facility with a 26.2% capacity factor.[15] Finally, according to the U.S. Energy Information Administration, onshore wind generation will remain economically unattractive until 2040,[16] and will remain miniscule for the Southeast region (which includes Kentucky) through 2050.[17]

The capacity factor of any potential Kentucky-based wind facility would thus be quite poor, and would thus likely not prove cost effective. Accordingly, any potential wind generation Kentucky Power would procure within the planning period consistent with a 35% - 37% capacity factor, whether through a self-build or purchase power agreement ("PPA"), would have to be wheeled in from a distant location within the PJM footprint such as off the Atlantic coast, which would necessarily add significant transmission expense to the overall cost.[18] While the Company asserts that "[a] resource acquisition analysis will include any known and forecasted costs, including known and forecasted transmission costs. . .",[19] nonetheless the thoroughness and validity of Kentucky Power's transmission modelling processes and procedures is not clear and lacks transparency. The concept of wheeling power from remote wind resources over long

[11] IRP, p. 104.
[12] *See*, "Development of Eastern Regional Wind Resource and Wind Plant Output Datasets," National Renewable Energy Laboratory, Subcontract Report NREL/SR-550-46764 (Dec.2009), p. 14, accessible at: https://www.nrel.gov/docs/fy10osti/46764.pdf . Moreover, for capacity planning purposes, PJM ascribes wind resources a capacity credit of only 12.3% of nameplate. IRP, p. 124 (*citing* PJM "Effective Load Carrying Capability Analysis for Wind and Solar Resources," Feb. 7, 2019).
[13] Id. at p. 16.
[14] "U.S. Wind Energy Performance (Capacity Factors) in 2019, https://emp.lbl.gov/wind-power-performance.
[15] Id.
[16] USEIA, "Annual Energy Outlook 2020," p. 39, slide 77 (Jan. 29, 2020), accessible at: https://www.eia.gov/outlooks/aeo/pdf/aeo2020.pdf
[17] Id. p. 40, slide 79.
[18] *See* response to AG 1-30 (b), stating that the modeling assumed any potential wind resources would be interconnected to the PJM system.
[19] Response to AG DR 1-3.

distances into the Company's service territory is suspect and unrealistic.[20] Given the rapidly escalating transmission costs the nation is currently experiencing and will continue to experience for the foreseeable future — especially within the PJM footprint — the Commission should require utilities to conduct robust modeling of transmission costs. AG/KIUC therefore believe that wind resources will not prove cost-effective for Kentucky Power's service territory within the instant IRP's planning period when transmission is fully considered and modelled in a transparent manner.[21]

C. Hydroelectric Resources

Citing the ". . . potentially lengthy time associated with environmental studies, Federal Army Corp of Engineer permitting, high up-front construction costs, and environmental issues (fish and wildlife)," Kentucky Power states it did not consider any "new" hydroelectric resources in the current IRP.[22] Apparently, the Company had limited its consideration to new self-build resources. AG/KIUC believe the Company should have considered and modelled potential PPA arrangements with owners of existing hydroelectric resources. Given Kentucky's abundant waterway access, failure to adequately consider all possible arrangements for procuring hydroelectric resources shows that Kentucky Power's IRP analysis is inadequate, and should be corrected in the Company's next IRP filing.

D. Reliability

Given the increasing reliance that Kentucky Power, and indeed all electric utilities are placing on intermittent renewable energy resources, AG/KIUC are concerned that an over-reliance on renewable resources could create unreasonable risks to the reliability of Kentucky's electric grid, and those risks may require additional mitigation measures that will increase costs, including the pairing of battery energy storage with the renewable resources. The Commission should take

[20] *See*, *e.g.*, response to AG 1-29 (e), indicating that transmission interconnection costs are only estimated, and no additional congestion costs were included in this IRP.

[21] AG/KIUC also note that while the Southern Renewable Energy Association's previously-filed comments are very helpful, nonetheless its comments regarding transmission are limited solely to the percentage of intermittent resources the transmission grid is capable of supporting, and make no mention of costs. *See* Southern Renewable Energy Association's Comments, filed Oct. 16, 2020, p. 7.

[22] IRP, pp. 105-106.

administrative notice of the multiple instances of reliability risks encountered in an increasing number of states, including blackout incidents within the past year in California, Texas, Oklahoma, and other states. These incidents highlight the concern of having a significant dependence on renewable energy resources such as Kentucky Power's IRP proposes. Renewable energy resources are by nature intermittent, especially so during winter months, a fact that is all the more important to winter peaking utilities such as Kentucky Power. Therefore, the Attorney General urges the Commission to require electric utilities in their IRP filings to carefully analyze the risks to reliability and the costs inherent with the adoption of increasing amounts of renewable energy resources.

Staff's 2/15/21 Report on the 2019 IRP of Kentucky Power Company

In Staff's Report concerning Kentucky Power's 2019 IRP, Staff expressed a concern with the reasonableness of Kentucky Power's plan "to meet PJM and AEP zonal peaks and not to meet the internal needs of Kentucky Power."[23] Staff explained its concern as follows:

> Staff expresses its concern that the preferred plan is not designed to meet winter peaking capacity needs of Kentucky Power, but the summer peaking needs of PJM and plans to rely on market energy purchases and on financial or contractional hedges. [24]

As noted earlier, Kentucky Power is a winter peaking utility whose winter peak in 2020 was projected to be 1,303 MW, and whose summer peak was projected to be about 300 MW less (1,012 MW). Staff appears to be concerned that while Kentucky Power is planning to meet PJM's reliability requirement, which is based on a summer peak capacity obligation, it is not properly planning to meet its winter peak demand requirement. In its report, Staff asserted:[25]

> Therefore, the IRP and the preferred plan presents an incomplete and misleading picture of Kentucky Power's true capacity needs overall as presented to the Commission and to its ratepayers. Kentucky Power went on to explain that to the extent the winter load is higher than its summer PJM obligation, that it would be a pure energy settlement and that the company could purchase that energy through the PJM energy market.
> **[footnote references removed]**

[23] Staff Report on 2019 IRP at 32.
[24] Id. at 32.
[25] Id. at 22.

AG/KIUC disagree with Staff that the Company has presented a misleading picture of its true capacity needs. It is actually an advantage for a winter peaking company to be part of the summer peaking PJM. That was the chief advantage East Kentucky Power Cooperative ("EKPC") achieved by joining PJM. EKPC, like Kentucky Power, has to maintain less capacity to meet the PJM summer reliability requirement versus meeting the higher winter peak plus reserves as a standalone utility.

The fact that the Company, AEP East[26] and all of the other PJM Member Companies fulfill their PJM capacity obligations helps ensure that all of the Member Companies provide reliable service all year long, not just during the summer period. PJM conducts detailed reliability studies to ensure that PJM meets the Loss of Load Expectation ("LOLE") standard of no more than one loss of load occurrence in ten years. This standard is not just a goal established by PJM, but it is also a requirement that PJM must follow as required by the Federal Energy Regulatory Commission ("FERC").

Each year, PJM conducts a Reserve Requirement Study to determine Forecast Pool Requirements for three future delivery years.[27] Even though those results are determined for the next three years, Kentucky Power uses the PJM Forecast Pool Requirement ("FPR") of 8.9% for all future years as its target planning reserve criteria. This is not unreasonable, as the FPR does not change significantly from one year to the next and has been close to 9% since PJM conducted its 2017 Reserve Requirement Study.

In addition to the PJM reserve criteria, which is based on the summer peak, PJM also has a winter reserve criteria that must also be adhered to, which ensures that the System is reliable not just during the summer, but also during the winter period as well. According to PJM Manual 20, entitled "PJM Resource Adequacy Analysis," PJM also has a winter weekly reserve target that must be met. The manual explains this requirement as follows:

1.6 Winter Weekly Reserve Target

[26] Includes Kentucky Power, Indiana Michigan Power, Appalachian Power, West Virginia Power, Wheeling Power, and Kingsport Power. These Companies operate in a FERC approved pool arrangement known as the Power Coordination Agreement ("PCA").

[27] PJM performs this study to satisfy its FERC and NERC mandated reliability requirements Standard BAL-502-RFC-03, Planning Resource Adequacy Analysis, Assessment and Documentation.

> Maintaining adequate winter weekly reserve levels after scheduling generator planned maintenance outages ensures that the Reliability*First* (RF) LOLE Standard is met with the approved IRM. In calculating PJM's installed capacity reserve requirement, the PRISM and Multi Area Reliability Simulation (MARS) program schedule unit planned outages on a weekly levelized reserve basis (reserve margins are held nearly the same from week to week). Reserves are intended to cover load forecast uncertainty and random unit forced outages. PJM RTO winter reserves are generally greater than those of the summer period, partly because winter unit ratings are generally greater and winter weekly peak loads are generally less than the corresponding values over the summer period.
>
> It is desirable to maintain a negligible loss of load risk over the winter period because virtually all the RTO region's LOLE (99.9%) is concentrated in the summer weeks, despite the complete absence of unit planned outages in the summer. Since the summer risk cannot be reduced further (without installing additional Capacity Resources), winter reserve levels must be held greater than those over the summer to ensure the desired yearly RTO LOLE. PJM coordinates equipment outages to obtain the desired LOLE while minimizing the need for additional generating capacity.

Furthermore, given that the entire PJM System meets this criteria and service to all PJM customers is reliable year-round, then Staff's concern would perhaps be better expressed as a question regarding economics rather than reliability. In its response to Staff's Post Hearing Request No. 2, the Company noted that when its winter peak demand is greater than its summer peak demand obligation, it buys energy from the pool. When this situation occurs, it does not mean that Kentucky Power suffers from a reliability issue, but instead it means it is more economic for Kentucky Power to purchase energy from within the PJM market than for Kentucky Power to construct new resources, especially since there is sufficient capacity available in PJM to meet Kentucky Power's winter peak. As long as Kentucky Power meets its PJM summer peak demand obligation, and PJM ensures that the entirety of the PJM System is reliable on a year round basis, then it would become an economic matter as to whether Kentucky Power should construct additional capacity to avoid having to purchase during the winter period.

Even if the Company were to construct physical assets such as combustion turbine units to satisfy its winter peak, Kentucky Power possibly would still purchase energy from the PJM market during the winter as opposed to running its newly built resources since PJM market resources could be cheaper to operate than Kentucky Power's new resources. Further, as the Company noted in its response to Staff's third post hearing request, in the event that the Company finds it necessary to hedge its winter load requirements, because there is an expectation of high market prices for an extended period of time, "the Company could seek to purchase a block of energy from a counterparty or purchase some other product such as a heat rate call option to hedge the energy short position in full or in part." Acquiring hedges in this manner would be consistent with Kentucky's policy to provide "an adequate and reliable supply of electricity to meet forecasted electricity requirements at the lowest possible cost." Finally, PJM consists of over 180,000 MW of generation capacity. Even if a new resource were acquired by Kentucky Power to satisfy an additional 300 MW of peak winter capacity (amount that the winter peak exceeds the summer peak), the impact on reliability would be very small. The power from any winter capacity that Kentucky Power would add would flow across the PJM transmission system and would provide reliability benefit to all of PJM. In other words, all of the additional cost would be on the Company's ratepayers, but about 99.9% of the additional reliability benefit would go to the rest of PJM.

While AG/KIUC disagree with Staff that the Company provided "an incomplete and misleading picture of Kentucky Power's true capacity needs," AG/KIUC do not object to Staff's recommendations for Kentucky Power's next IRP. It is entirely appropriate for Staff to ensure that Kentucky Power's involvement as a PJM member continues to be beneficial for customers. AG/KIUC therefore urge that Kentucky Power address the following Staff requests in the next IRP:

- Kentucky Power should provide a detailed cost-benefit study demonstrating why it should continue to participate in PJM as an FRR versus RPM and discuss the advantages of remaining an FRR company. Two analyses should be performed, one in which the Mitchell station is retired in 2028 and another in which the Mitchell station continues to operate beyond 2028.
- Kentucky Power should explicitly discuss how and demonstrate that its winter capacity requirements are being satisfied over the forecast horizon. The discussion should include the role the PCA plays in the satisfaction of Kentucky Power's seasonal capacity and energy requirements.

Respectfully Submitted,

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