

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2016 INTEGRATED RESOURCE)
PLANNING REPORT OF KENTUCKY POWER COMPANY) CASE NO.
TO THE PUBLIC SERVICE COMMISSION OF KENTUCKY) 2016-00413

COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION
TO KENTUCKY POWER COMPANY

Kentucky Power Company ("Kentucky Power"), pursuant to 807 KAR 5:001, is to file with the Commission an original and eleven copies in paper medium and an electronic version of the following information. The information requested herein is due on or before March 10, 2017. Responses to requests for information in paper medium shall be appropriately bound, tabbed and indexed. Each response shall include the name of the individual responsible for responding to questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or the person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

Kentucky Power shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which

Kentucky Power fails or refuses to furnish all or part of the requested information, it shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention shall be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request. When applicable, the requested information shall be separately provided for total company operations and jurisdictional operations. When filing a paper containing personal information, Kentucky Power shall, in accordance with 807 KAR 5:001, Section 4(10), encrypt or redact the paper so that personal information cannot be read.

1. Refer to the Integrated Resource Plan (“IRP”), page 14 of 1497, where the Rockport Plant Unit Power Agreement (“UPA”) is discussed.

a. Identify and describe the changes that non-renewal of the UPA would have on the assumptions and conclusions made for the 15-year period of the IRP.

b. Explain when the actual decision will be made on whether to renew the UPA.

2. Refer to the IRP, page 15 of 1497, Figure ES-1. The first footnote states, “Change in load obligation and net capacity position is due to transition from PJM load forecast to internal load forecast.”

a. Explain the basis for the transition of the load forecast.

b. Explain why the transition in the load forecast produces a reduction in Kentucky Power's total obligation as shown in Figure ES-1.

3. Refer to the IRP, page 15 of 1497, where it states, in relevant part, "the Plexos[®] modeling was performed through year 2035, so as to properly consider various cost-based 'end effects' for the resource alternatives being considered." In Kentucky Power's 2013 IRP, the modeling was performed through 2040, whereas, in the 2016 IRP the modeling was performed through 2035.

a. Explain why Kentucky Power shortened the term of the modeling from what was used in its 2013 IRP.

b. Identify and explain what changes the term of the modeling had on the various cost-based end effects and on the assumptions and conclusions made for the 15-year period of the IRP.

4. Refer to the IRP, pages 61-62 of 1497, which state that [o]ver the next three years [Kentucky Power] is anticipating turbine upgrades at the Rockport Plant which will increase unit capacities by 36 MW for Unit 1 and Unit 2 in 2018 and 2020, respectively." Identify and describe the impacts, if any, the upgrades will have on the charges Kentucky Power pays under the UPA for calendar years 2018 through 2022.

5. Refer to the IRP, pages 15 and 16 of 1497, regarding Kentucky Power's Preferred Plan, second bullet, where it states, "adds 75 MW (nameplate capacity)/year of wind resources beginning in 2018 for a total of 300 MW through 2021." Also refer to the comments filed by the Southern Wind Energy Association ("Southern"), beginning at page 2, which list several recommendations, including that Kentucky Power immediately issue a request for proposal for at least 300 MW of wind energy resources, and select

preferred wind power purchase agreement(s) before the end of 2017 for delivery by 2020/2021. Describe Kentucky Power's strategy for procuring the wind power included in its Preferred Plan and how it is similar to or different from the recommendation of Southern.

6. Refer to the IRP, pages 15 and 16 of 1497, regarding Kentucky Power's Preferred Plan, fifth bullet, regarding distributed generation. The footnote to this bulleted item states that "Kentucky Power does not have control over the amount, location or timing of these additions." Describe in detail how Kentucky Power arrived at its estimate of 1.1 MW (nameplate) by 2031.

7. Refer to the IRP, page 19 of 1497, where it states, "The capacity contribution from renewable resources is fairly modest due to their intermittent performance, as well as the implications of PJM's Capacity Performance rule" Identify and explain the implications of PJM's Capacity Performance rule on renewable resources.

8. Refer the IRP, page 33 of 1497. Distributed generation was reduced from 41 MW by 2028 in the 2013 IRP to 1 MW in the 2016 IRP.

a. Discuss what led to this level of decrease from the 2013 IRP to the 2016 IRP.

b. Explain whether Kentucky Power has considered any changes to its net metering tariff to encourage distributed generation in its service area.

9. Refer to the IRP, Section 2.4.3, Short-Term Forecasting Models, page 39 of 1497. Explain how and why January 2006 through January 2016 was chosen as the estimation period for the short-term models.

10. Refer to the IRP, Section 2.4.4, Long-Term Forecasting Models, page 40 of 1497.

a. Indicate whether a lagged price or a moving average of price was used to introduce the concept of lagged response to a price change in the econometric model.

b. Explain how and why 1995–2015 was chosen as the general estimation period for the long-term forecasting models.

11. Refer to the IRP, Section 2.4.4.2, Residential Energy Sales, page 43 of 1497. Provide a copy of Kentucky Power's three most recent Residential Customer Surveys and indicate the year of each survey.

12. Refer to the IRP, Section 2.4.4.2, Residential Energy Sales, page 43 of 1497, where it states, "The appliance saturations are based on historical trends from KPCo's residential customer survey." Explain whether these historical trends are from the most recent (2015) survey or from a series of surveys. If from a series of surveys, identify which surveys.

13. Refer to the IRP, Section 2.4.4.4.1, Manufacturing Energy Sales, page 44 of 1497. Explain whether the current forecast reflects load added or subtracted from the model results to reflect plant openings, closures, or load adjustments. If so, identify the amount of load added or subtracted and describe what gave rise to the addition or subtraction.

14. Refer to the IRP, Section 2.4.4.4.2, Mine Power Energy Sales, page 44 of 1497. Provide an update on Kentucky Power's sales from this customer base from the

January 2016 data point through the most recent month for which information is available.

15. Refer to the IRP, Section 2.4.6, Forecast Methodology for Seasonal Peak Internal Demand, page 46 of 1497, where it states, "The weather profiles are developed from representative weather stations in the service area." List the weather stations and explain whether there has been any change in the weather stations used by Kentucky Power since its 2013 IRP. If any changes have occurred, identify the changes.

16. Refer to the IRP, Section 2.4.5.2, Losses and Unaccounted-For Energy, page 46 of 1497, and Exhibit C-1, Annual Internal Energy Requirements and Growth Rates, page 170 of 1497. Explain how the annual losses are calculated.

17. Refer to the IRP, Section 2.4.6, Forecast Methodology for Seasonal Peak Internal Demand, page 46 of 1497. Kentucky Power modeled weather profiles based on 30 years of historical weather data.

a. Explain whether Kentucky Power considered using 20 years or some other period of historical weather data.

b. If the answer to part a. is yes, explain why Kentucky Power decided against using 20 years or some other period of historical weather data.

c. Provide the annual heating and cooling degree days for 20 years and the percent differences.

18. Refer to the IRP, Section 2.6.2, DSM Impacts on the Load Forecast, page 50 of 1497. Explain why the IRP model selected optimal levels of economic energy efficiency ("EE").

19. Refer to the IRP, Section 2.6.3, Interruptible Load, page 50 of 1497. Kentucky Power states that the load forecast does not reflect any load reduction from interruptible customers, as the interruptible load is seen as a resource when the Company is peaking. Explain whether this assumption reflects a change in methodology from Kentucky Power's 2013 IRP.

20. Refer to the IRP, Section 2.6.4, Blended Load Forecast, page 51 of 1497. Describe any instances when the long-term model incorporates a structural shift in the underlying economy within the first 24 months of the forecast horizon and explain how "professional judgment" was used to adjust for this structural shift in the forecast.

21. Refer to the IRP, Section 2.7, page 53 of 1497, where it states, "For Kentucky Power, the low-case and high-case energy and peak demand forecasts for the last forecast year, 2031, represent deviations of about 8.1% below and 8.8% above, respectively, the base-case forecast." Provide the deviation percentages for the years 2020 and 2025.

22. Refer to the IRP, Section 2.8, Energy Price Relationships, page 54 of 1497. Provide the short-term and long-term price elasticities of demand for electricity that are utilized in Kentucky Power's forecasting models.

23. Refer to the IRP, Section 2.9.3, Forecasting Methodology, page 56 of 1497, which states that Kentucky Power explores opportunities to enhance forecasting methods on a continuing basis.

a. State whether the forecasts in this IRP reflect any changes from the methods used in developing the forecasts included in Kentucky Power's 2013 IRP.

b. If there were changes in methods since the 2013 IRP, identify and describe all such changes, and explain why they were made.

24. Refer to the IRP, Section 2.12.4, Forecast Updates, page 58 of 1497. Provide the load forecast updates submitted by Kentucky Power in 2014, 2015, and 2016.

25. Refer to the IRP, Section 2.12.5, KPSC Staff Recommendations Addressed, page 59 of 1497, Item 3. Explain whether Kentucky Power has considered using actual historical data for 12-month periods ending in September, which would eliminate the use of forecast data and would include a single complete winter season.

26. Refer to the IRP, Section 3.1, Current Supply-Side Resources, page 62 of 1497, the first complete paragraph, regarding discussion of Figure 9 and the table found in Exhibit G-11, Volume A, page 239. As PJM does not offer any projection of capacity requirements beyond 2019, explain why Kentucky Power would expect its capacity obligation to be less for years 2020–2031.

27. Refer to the IRP, Section 3.1, Current Supply-Side Resources, page 62 of 1497, last paragraph. Explain the impact to Kentucky Power's capacity obligation should the UPA with Rockport not be renewed and what the expected contingencies are.

28. Refer to the IRP, Section 3.2.3, National Ambient Air Quality Standards (NAAQS), page 66 of 1497. Under the final data requirements rule for the 2010 1-hour SO₂ Primary NAAQS, states had to submit their intentions for addressing sources with SO₂ emissions greater than 2,000 tons per year by July 1, 2016. Three options were available: 1) monitoring; 2) modeling; or 3) emission limitations.

a. For Rockport and Mitchell, respectively, what options were chosen by the Indiana Department of Environmental Management and the West Virginia Department of Environmental Protection, assuming that option 3 was not a viable option?

b. If the monitoring option was chosen, was the monitoring network installed by the January 1, 2017 deadline?

c. If the modeling option was chosen, what did the modeling analysis reveal that was due by January 13, 2017?

29. Refer to the IRP, Section 3.2.4, Coal Combustion Residuals ("CCR") Rule, page 66 of 1497. Kentucky Power states that "initial estimates of the anticipated plant modifications and capital expenditures are factored into this IRP." What are the expected impacts to Kentucky Power's ratepayers?

30. Refer to the IRP, Section 3.2.5, Effluent Limitations Guidelines, page 67 of 1497.

a. Provide the information concerning the necessary plant modifications and capital expenditures for each of Kentucky Power's generating units, as well as the Rockport plants.

b. What is the estimated impact to Kentucky Power's ratepayers for compliance with this rule at Mitchell and Rockport?

31. Refer to the IRP, Section 3.2.8, Carbon Dioxide ("CO₂") Regulations, page 70 of 1497, including the Clean Power Plan ("CPP"). Should the courts determine that the CPP should be limited to Building Block 1 measures only, describe what, if any,

efficiency gains could be implemented at Rockport and Mitchell, their anticipated costs, and any anticipated downtime of the units.

32. Refer to the IRP, Section 3.3.5, Volt VAR Optimization (“VVO”), page 84 of 1497, which states, “VVO enables Conservation Voltage Reduction (“CVR”) on a utility’s system. CVR is a process by which the utility systematically reduces voltages in its distribution network, resulting in a proportional reduction of load on the network.” Also refer to page 33 of 1497, where Kentucky Power states, “Demand side programs, including VVO have more than doubled in the 2016 plan compared to the 2013 plan, from 44 MW to 89 MW.”

a. Provide the current amount of VVO on Kentucky Power’s system, and whether it is residential, commercial and/or industrial.

b. Explain whether the current amount of VVO on Kentucky Power’s system has enabled CVR and, if so, describe.

33. Refer to the IRP, Section 4.3.1.1, Emission Reduction Credit (“ERC”) Pricing, page 101 of 1497, where it states, “In fact, based on mass-based versus rate-based pricing approaches, from other observed projections, overall mass versus rate pricing profiles were generally consistent.” Describe in greater detail the ways in which the mass and rate pricing profiles are consistent.

34. Refer to the IRP, Figure 23 on page 107 of 1497.

a. Identify the basis for the PJM capacity prices.

b. Explain the basis for the decrease in PJM capacity prices through 2023 and the increase from 2023 through the end of the planning period.

35. Refer to the IRP, Section 4.4, PJM Capacity Performance Rule Impacts, page 108 of 1497. With the assumption that “solar resources will be valued at 38% of nameplate rating, consistent with current PJM criteria for new solar sources,” explain why the assumption for wind is that “wind resources will be valued at 5% of nameplate capacity rating, a reduction from the current PJM criterion of 13.5% for new wind resources.”

36. Refer to the IRP, Section 4.5.2, Levels of Energy Efficiency Potential, page 109 of 1497.

a. Explain the various benefits and costs and how those benefits and costs are determined in defining economic potential.

b. Provide the avoided cost value that is used, how the avoided cost is determined, and whether avoided cost is influenced by declining load and customer base.

c. Provide a schedule showing the amount of the avoided costs used for cost/benefit tests in the 2010, 2013, and 2016 IRPs. Also, provide the amount of the avoided cost used for modeling purposes from 2013 through 2016.

d. Identify and explain any difference(s) in determining avoided cost in the 2010, 2013, and 2016 IRPs.

37. Refer to the IRP, Section 4.5.3.1, Incremental Energy Efficiency Modeled, page 112 of 1497. Kentucky Power states that each EE bundle is included in the portfolio of optimized resources if the model determines that it is economical.

a. Provide the criterion which makes a bundle economical.

b. Provide the list of EE bundles and explain whether it was determined to be economical and included or determined to be non-economical and not included.

38. Refer to the IRP, Section 4.5.3.4, Distributed Generation (“DG”), page 114 of 1497.

a. Explain if Kentucky Power evaluated the impact of commercial DG.

b. Refer to Figure 25. Provide the annual growth rate of Kentucky Power’s forecasted rooftop solar installations.

39. Refer to the IRP, Section 4.5.3.5, Combined Heat and Power (“CHP”), page 115 of 1497, which states, “The option developed is a 15 MW facility utilizing a natural gas fired combustion turbine, Heat Recovery Steam Generator (HRSG) and SCR to control NOx.”

a. Explain whether the 15-MW facility is newly constructed or a retrofit, and whether it will be Kentucky Power’s facility or that of a customer within Kentucky Power’s service territory.

b. If the CHP facility is Kentucky Power’s, with an estimated installed cost of \$1,800/kW and an assumed capacity factor of 90 percent, explain the need for such a facility, and provide the cost/benefit to construct.

40. Refer to the IRP, Section 5.1, The *Plexos* Model – An Overview, page 130 of 1497.

a. When *Plexos* adds the program costs of DSM alternatives, confirm that they are added based on marginal cost pricing, and when added have the least marginal cost.

b. Explain what encompasses the program costs of DSM alternatives and provide an example.

c. Explain whether the DSM alternatives are forecasted DSM additions or existing DSM programs.

41. Refer to the IRP, Section 5.2.1, Modeling Options and Constraints, page 134 of 1497. Explain why the large-scale solar resources costs differ between Tier 1 and Tier 2.

42. Refer to the IRP, Section 5.3.2, Comparing the Cost of the Preferred Plan, pages 139-141 of 1497. Explain if the comparison between the Preferred Plan and the “Do Nothing Plan” is done based on a mid, high, or low assumption analysis.

43. Refer to the IRP, Exhibit C-1, Annual Internal Energy Requirements and Growth Rates, page 170 of 1497. Compare the variance between the 2016 forecast losses and the actual 2016 losses.

44. Refer to the IRP, Exhibit C-6, DSM/EE included in Load Forecast, page 176 of 1497. Also refer to Case No. 2015-00271, Exhibit 6.¹ Explain and reconcile why the forecasted DSM energy, summer peak, and winter peak in Exhibit C-6 differ from the program summary tables in Exhibit 6.

45. Refer to the IRP, Exhibit C-7, Blended Forecast vs. Long-Term Model Results, page 177 of 1497.

¹ Case No. 2015-00271, *Application of Kentucky Power Company for (1) Authority to Modify Certain Existing Demand-Side Management Programs; (2) Authority to Implement New Programs; (3) Authority to Discontinue Certain Existing Demand-Side Management Programs; (4) Authority to Recover Costs and Net Lost Revenues, and to Receive Incentives Associated with the Implementation of the Programs; and (5) All Other Required Approvals and Relief*, (Ky. PSC Mar. 11, 2016).

a. Explain why the customer forecasts for residential and industrial are not a blend of long-term and short-term forecasts.

b. Explain why the sales forecasts for each class are not a blend of long-term and short-term forecasts.

46. Refer to the IRP, Exhibit C-19, Profiles of Monthly Peak Internal Demands, page 189 of 1497. Provide this exhibit with a legend.

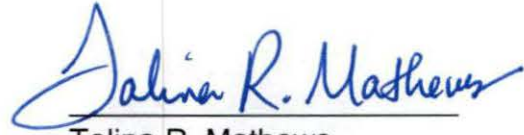
47. Identify and describe any procedures in addition to its current processes that Kentucky Power can adopt in evaluating current and potential DSM programs.

48. Even though Kentucky Power is not currently offering any industrial DSM programs, and many of its industrial customers have their own in-house energy conservation and EE initiatives, state whether Kentucky Power has received any inquiries as to available grants, subsidies or low-interest loans for energy conservation or EE that may help those customers remain economically stable or market competitive.

49. Provide a detailed discussion on Kentucky Power's consideration of implementing a Prepay Metering program.

50. Explain whether there has been any change, internally or externally, in the methods of evaluation, measurement, and verification used by Kentucky Power for existing or proposed DSM programs. Identify the cost associated with such changes, if they exist.

51. Explain if there are any industrial DSM opportunities assumed in the forecast.



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