

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF)	
LOUISVILLE GAS AND ELECTRIC)	
COMPANY AND KENTUCKY UTILITIES)	
COMPANY FOR APPROVAL OF A SOLAR)	
POWER CONTRACT AND TWO)	CASE NO. 2020-00016
RENEWABLE POWER AGREEMENTS TO)	
SATISFY CUSTOMER REQUESTS FOR A)	
RENEWABLE ENERGY SOURCE UNDER)	
GREEN TARIFF OPTION #3)	

RESPONSE OF
LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY
TO COMMISSION STAFF'S INITIAL REQUEST FOR INFORMATION
DATED JANUARY 31, 2020

FILED: FEBRUARY 5, 2020

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **David S. Sinclair**, being duly sworn, deposes and says that he is Vice President, Energy Supply and Analysis for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.



David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 5th day of February 2020.



Notary Public

My Commission Expires:
Judy Schooler
Notary Public, ID No. 603967
State at Large, Kentucky
Commission Expires 7/11/2022

**Louisville Gas and Electric Company and Kentucky Utilities Company
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Question No. 1

Witness: David S. Sinclair

- Q-1. Refer to the Application, page 6, paragraph 11.b. Provide the projected life of the solar generation facility.
- A-1. Per Article 2 of the Solar Power Contract with Rhudes Creek Solar, LLC, "The PPA shall become effective as of the Effective Date and shall remain in full force and effect until the twenty (20) year anniversary of the Commercial Operation Date." Therefore, the Companies expect that the life of the Rhudes Creek Solar, LLC solar generation facility will be at least consistent with the Solar Power Contract's 20-year term. Under the Solar Power Contract, the Companies will only pay for energy delivered by the Rhudes Creek Solar, LLC facility. The Solar Power Contract's availability guarantees and requirements for prudent maintenance apply throughout the 20 year term.

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Question No. 2

Witness: David S. Sinclair

- Q-2. Refer to the Application, page 9, paragraph 18. Explain why LG&E/KU are incapable of satisfying the industrial customers' requests for renewable energy sources absent the current proposal. Include in the explanation a discussion of the reasons that LG&E/KU cannot build sufficient renewable generation to satisfy customers' requests.
- A-2. The Green Tariff Option #3 states, "4. Energy serving this option must be generated from a renewable resource developed on or after the Kentucky Public Service Commission special contract approval date." Thus, because the current renewable resources of LG&E/KU do not qualify under the terms of the Green Tariff Option #3, the proposed Solar Power Contract with Rhudes Creek Solar, LLC is required to satisfy the industrial customers' requests for renewable energy sources which complies with the terms of the Green Tariff Option #3. The Companies currently are not capable of satisfying the requests of Toyota and Dow Chemical for intermittent energy from a new renewable resource in the identified time period at a lower cost than the price established by the responses to the RFP. Going forward, the Companies may propose a "self-build option" in response to future Renewable RFPs just as they have done so in past RFPs for generating capacity.

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Question No. 3

Witness: David S. Sinclair

- Q-3. Refer to the Application, page 9, paragraph 19. For one-hour increments over the past two years, provide LG&E/KU's marginal unit dispatch order and cost for every unit. Provide the response in Excel spreadsheet format, with formulas intact and unprotected and all rows and columns accessible.
- A-3. See attached. This Excel file includes the following three tabs.
- The "DATA" tab shows the output of the Companies' After-the-Fact Billing system, which allocates energy sources by LG&E and KU ownership to energy uses (native load or off-system) by estimated incremental energy cost. These allocations are grouped into the blocks of energy shown on this tab for the energy produced above each unit's minimum operating level. The energy cost, which includes fuel and variable operating costs, is shown for each hour of 2018 and 2019 for each of the Companies' thermal generating units, excluding hours when the combustion turbine units were tested. The Companies' hydro and solar units, which dispatch at effectively zero cost, and the Companies' purchases are also excluded.
 - The "PIVOT" tab includes an Excel pivot table, which summarizes the data by showing the estimated incremental energy cost of the highest cost block of energy for each unit operating in each hour above its minimum operating level.
 - The "LEGEND" tab provides the unit name for each abbreviated Unit ID.

This information is considered confidential and is being produced under seal pursuant to a Joint Petition for Confidential Protection.

The entire attachment is
Confidential and
provided separately
under seal.

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Question No. 4

Witness: David S. Sinclair

Q-4. Refer to the Application, page 9, paragraph 19, and the Direct Testimony of David S. Sinclair (Sinclair Testimony), page 24, line 21, through page 25, line 1.

- a. Explain whether other interested customers were given the opportunity to participate in this solar facility.
- b. Explain why LG&E/KU would not contract the remaining 25 percent of this solar facility to an interested customer instead of issuing another request for proposals.
- c. Refer also to Exhibits 4 and 5. Explain whether the minimum billing load requirement has precluded any interested customer from participating. If so, explain whether the minimum amount is still appropriate.

A-4.

- a. Yes. Toyota asked KU about renewable options prior to approval of the Green Tariff, so the Companies began discussions in response to Toyota's earlier requests. Dow reached out to KU after approval of the Green Tariff to explore renewable alternatives. During the same time period as the Toyota and Dow discussions, the Companies also spoke with other large customers that qualify for the Green Tariff Option #3, but no other customers decided to participate prior to the filing of this application.
- b. The Green Tariff Option #3 expressly provides: "Energy serving this option must be generated from a renewable resource developed on or after the Kentucky Public Service Commission special contract approval date." As explained in response (a) above, no other large customers were interested in pursuing discussions regarding service under Green Tariff Option #3 prior to this filing. Therefore, allowing other customers to participate at this time would, in effect, give them a free option to participate once all the contractually committed parties (i.e., the Companies, ibV Energy Partners, Dow, and Toyota) had invested the time, resources and commitments to make this filing possible. Contractual certainty by and from the counterparties in these contracts was essential to achieve their commitments in timely manner. Allowing potential customers to participate at this point would send a message to potential counterparties that, in the future, no one need seek participation until after a filing. This would likely have the undesirable effect of causing the Companies to first negotiate and execute a contract with a renewable developer, file it with the Commission, and then hope that a

customer would choose to participate. If none did, either 100 percent of the energy would need to go to all customers or the Companies would be forced to terminate the contract. Such a scenario creates too much risk to attract competitive and unqualified bids from solar developers at this time. Under such unfavorable conditions, solar developers would likely forgo submitting responses to RFPs or reflect the increased risk in their bid prices. Under the proposal before the Commission in this case, customers are reasonably expected to benefit from the remaining 25 percent of this solar facility. .

- c. No. The minimum billing requirement ensures that utility scale projects remain the focus of Green Tariff Option #3. Green Tariff Option #2 (Business Solar) remains an option for customers with smaller loads.

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Question No. 5

Witness: David S. Sinclair

- Q-5. Refer to the Application, page 9, paragraph 19, and Case No. 2018-00348.¹ Provide LG&E/KU's actual and targeted reserve margins for 2019 and any updates from the projected reserve margin presented in Case No. 2018-00348.
- A-5. The Companies' target summer reserve margin range is between 17 and 25 percent, as explained in Case No. 2018-00348. The Companies' forecasted summer planning reserve margins for 2019 through 2033, based on current planning assumptions are show in the following table. For illustrative purposes, the expected energy output of the proposed 100 MW solar PPA at the time of the Companies' summer peak load was assumed to be 60% of its maximum output, as shown in this table.

Summer Reserve Margin Forecast (MW, Base Energy Requirements Forecast)

	2019	2020	2021	2022	2023	2024	2027	2030	2033
Gross Peak Load	6,679	6,671	6,663	6,656	6,655	6,652	6,656	6,658	6,656
DCP	-98	-94	-90	-86	-82	-79	-73	-70	-66
DSM	-262	-267	-273	-279	-284	-290	-296	-296	-296
Net Peak Load	6,319	6,310	6,300	6,291	6,288	6,283	6,287	6,293	6,294
Existing Capability ²	7,488	7,486	7,487	7,487	7,487	7,487	7,488	7,488	7,453
Small-Frame SCCT ³	87	73	73	59	59	59	59	59	59
CSR	139	139	139	139	139	139	139	139	139
Proposed Solar PPA	0	0	0	60	60	60	60	60	60
OVEC ⁴	162	162	162	162	162	162	162	162	162
Total Supply	7,876	7,860	7,861	7,907	7,907	7,907	7,908	7,908	7,873
Reserve Margin	1,556	1,549	1,560	1,616	1,618	1,623	1,620	1,614	1,578
Reserve Margin %	24.6%	24.6%	24.8%	25.7%	25.7%	25.8%	25.8%	25.7%	25.1%

¹ Case No. 2018-00348, Electronic 2018 Joint Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company (filed October 19, 2018).

² Existing capability is shown excluding small-frame SCCTs, CSR, and OVEC and including 1 MW derates on each of the E.W. Brown Units 8, 9, and 11, which are planned to be resolved by 2024.

³ Cane Run 11 was retired in November 2019. Zorn is planned to be retired by the end of 2021.

⁴ OVEC's capacity reflects the 162 MW that is expected to be available to the Companies at the time of the summer peak, including the Companies' share of the bankrupt OVEC sponsor, FirstEnergy Solutions.

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Question No. 6

Witness: Robert M. Conroy

- Q-6. Refer to the Application, Exhibit 2, page 3 of 12, and Exhibit 3, page 3 of 11. Section 1.4, PPA Pricing, specifies that the customers will pay KU's tariffed standard rate components. Explain the impact, if any, on these customers' billings for percentage of revenue or usage based riders and surcharges.
- A-6. The three volumetric billing riders are the DSM-Demand Side Management, FAC-Fuel Adjustment Clause, and OSS-Off System Sales Adjustment Clause.
- DSM – all accounts associated with Exhibit 2 and Exhibit 3 have opted-out of DSM through the industrial opt-out provisions pursuant to the terms of the rider's schedule. Thus, the DSM rider does not apply to Toyota or Dow.
 - FAC / OSS – The volumes utilized to calculate these adjustment riders will represent actual metered kWh less the multiplication of actual metered Solar Generation times the customers contracted percentage.

The ECR-Environmental Cost Recovery Surcharge will continue to be applied to the bill on a percentage of revenue. The customer's bill will reflect the Energy Offset (Section 2.7 (d)) and the Peak and Intermediate Demand Charge Offsets (Section 2.7 (e)) prior to the application of the ECR billing factor. The Renewable Energy Charge (Section 2.5 (b)) will not be included in revenue applicable to the ECR billing factor.

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Question No. 7

Witness: David S. Sinclair

- Q-7. Refer to the Sinclair Testimony, page 6, lines 10-13. Explain why the Renewable Request for Proposals' focus on energy only, rather than on capacity, would increase the potential competitiveness of renewable generation.
- A-7. The goal of the Companies' RFP process was to assess the market for opportunities to reduce energy costs for customers. By focusing on energy only, the Companies did not require the proposed renewable resources to provide firm capacity, for which the Companies do not currently have a need. Due to the intermittent nature of renewable resources, a firm capacity requirement would necessitate the renewable resource to be paired with a dispatchable resource, such as a battery or combustion turbine, which would come at an additional cost. As discussed on page 13 of Exhibit DSS-2 in Section 3.2.1, the high cost of the battery storage proposals from the RFP made them economically unviable. As discussed on page 9 of Exhibit DSS-2, by relying on the existing fleet for reliability and only looking at decremental energy costs, the Companies are evaluating intermittent generation like wind and solar in the most favorable way possible by focusing only on decremental fuel costs.

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Question No. 8

Witness: David S. Sinclair

- Q-8. Refer to the Sinclair Testimony, page 8, lines 3-10.
- a. Provide the cost assumptions and analyses referenced for the proposal evaluations.
 - b. Provide an explanation of how each of the updated assumptions used in the analyses differ from those used in LG&E/KU's integrated resource plan in Case No. 2018-00348.
- A-8.
- a. The cost assumptions and analyses are provided in Exhibit DSS-2.
 - b. The fuel prices used in Case No. 2018-00348 ("2018 IRP") are the same as those shown in Table 3 (2019 Business Plan Fuel Prices) on page 9 of Exhibit DSS-2. The variances between the updated 2020 Plan Henry Hub natural gas prices and those used in the 2019 Plan/2018 IRP are shown in the following table. The 2019 Plan and 2018 IRP did not include high and low coal price scenarios. The variances between the updated 2020 Plan base coal prices and the coal prices used in the 2019 Plan/2018 IRP are also shown in the following table.

The high CO₂ price forecast used in the 2020 Business Plan update is the same as the high CO₂ price forecast used in the 2018 IRP. The 2018 IRP did not use renewable energy certificate price scenarios.

Change in Fuel Price Forecasts (2020 Plan - 2019 Plan; Nominal \$/MMBtu)

	Natural Gas (Henry Hub)			Coal
	Low	Base	High	Base
2020	(0.44)	(0.13)	(0.52)	0.01
2021	(0.49)	(0.21)	(0.52)	0.03
2022	(0.51)	(0.21)	(0.51)	0.00
2023	(0.45)	(0.17)	(0.52)	(0.03)
2024	(0.38)	(0.13)	(0.52)	(0.05)
2025	(0.29)	(0.11)	(0.51)	(0.08)
2026	(0.20)	(0.13)	(0.51)	(0.05)
2027	(0.10)	(0.15)	(0.51)	(0.07)
2028	(0.02)	(0.17)	(0.51)	(0.08)
2029	0.05	(0.15)	(0.50)	(0.10)
2030	0.13	(0.03)	(0.50)	(0.14)
2031	0.13	0.02	(0.51)	(0.16)
2032	0.13	0.09	(0.50)	(0.17)
2033	0.13	0.18	(0.50)	(0.17)
2034	0.13	0.28	(0.50)	(0.20)
2035	0.13	0.34	(0.49)	(0.23)
2036	0.12	0.36	(0.49)	(0.24)
2037	0.12	0.43	(0.49)	(0.27)
2038	0.11	0.45	(0.49)	(0.29)
2039	0.11	0.43	(0.49)	(0.31)
2040	0.10	0.45	(0.49)	(0.36)
2041	0.09	0.50	(0.49)	(0.34)
2042	0.09	0.54	(0.48)	(0.37)
2043	0.09	0.57	(0.48)	(0.44)
2044	0.08	0.56	(0.48)	(0.50)
2045	0.07	0.61	(0.47)	(0.55)
2046	0.07	0.63	(0.47)	(0.59)
2047	0.06	0.63	(0.48)	(0.66)
2048	0.05	0.61	(0.48)	(0.74)
2049	0.05	0.60	(0.47)	(0.80)
2050	0.05	0.59	(0.47)	(0.86)

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Question No. 9

Witness: David S. Sinclair

- Q-9. Refer to the Sinclair Testimony, page 12, lines 7-15. Fully explain why the size of a renewable generation project and the length of a purchase power agreement would impact the pricing.
- A-9. The observations on page 12, lines 7-15 were based on the responses to the Renewable RFP. The respondents were not asked to explain the basis by which they developed their pricing. See Section 3.3 in Exhibit DSS-2. However, it appears there are economies of scale in project development, physical plant construction, and financing. As to a longer term resulting in a lower price, since the costs of a solar plant are largely fixed, a longer term agreement spreads those fixed costs out over more energy with certainty so it is possible that developers would pass that risk reduction on to the buyer.

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Question No. 10

Witness: Robert M. Conroy

- Q-10. Refer to the Sinclair Testimony, page 18, lines 4-10. Explain any impact on LG&E/KU's Fuel Adjustment Clause or Environmental Cost Recovery Surcharge.
- A-10. The generation from the Solar Power Contract will be placed at the bottom of the generation dispatch stack through the After-the-Fact Billing ("AFB") process thus pushing all other resources higher in the stack and displacing the equivalent highest cost resources. The energy cost from the 25% applicable to all customers (9.75% to LG&E and 15.25% to KU) will be included in the FAC as purchase power expense. The remaining 75% of the energy costs will be directly billed to Toyota and Dow under their Renewable Power Agreement. Overall, the FAC should be lower as a result of the energy received from the Solar Power Contract.

The Environmental Cost Recovery Surcharge will continue to be calculated in the same manner as it is approved today. The revenues received from Toyota and Dow that are subject to the ECR billing factor will be lower as a result of the Renewable Power Agreement. See the response to Question No. 6.

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Question No. 11

Witness: David S. Sinclair

- Q-11. Refer to the Direct Testimony of Robert M. Conroy, page 11, lines 22-24. In Case Nos. 2018-00294 and 2018-00295, LG&E/KU stated that an aggregated 100 MW of green power under Option 3 of the Green Tariff should be absorbable in the companies' system without material integration issues.⁵
- a. If there were material integration issues, describe those issues and discuss LG&E/KU's mitigation processes.
 - b. As it has been less than one year since the Green Tariff was initially approved, explain why the megawatts that could be integrated with no material issues have increased 150 percent.
 - c. State whether 250 MW is now the upper limit that could be integrated with no material issues or if that amount is larger than 250 MW.
 - d. If larger, provide the amount.
- A-11.
- a. The integration issues that can arise at some point from increasing the integration of intermittent renewable generation primarily relate to the ramping capabilities of the Companies' existing dispatchable generation to respond to intermittent generation and the cost-effective commitment of these units to continue to reliably serve customer's energy needs at every moment. In addition, intermittent renewables affect the operation of the transmission system both broadly and at the circuit level. Such impacts are evaluated on a case-by-case basis in the transmission studies conducted during a generator's interconnection request process.
 - b. The proposed increase in the Green Tariff Option #3's system cumulative MW nameplate of a total 150 MW is relatively small when compared to the Companies' system. It represents only 2 percent of the Companies' total generating capacity and an even smaller percentage of energy. An additional 150 MW of solar with a 25 percent

⁵ Case No. 2018-00294, Application of Kentucky Utilities Company for an Adjustment of Its Rates and Case No. 2018-00295, Application of Louisville Gas and Electric Company for an Adjustment of Its Electric and Gas Rates, Direct Testimony of Robert M. Conroy, page 22, lines 10-12.

capacity factor would only generate approximately 1 percent of the Company's annual energy requirements.

- c. The proposed 250 MW is not intended to be considered an upper limit on the amount of renewables that can be integrated without material issues. Due to the intermittent nature of renewable resources, the Companies are taking an incremental approach to integrating renewables on the Companies' system.
- d. This amount has not been determined.