COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

JOINT APPLICATION OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF A COMBINED CYCLE COMBUSTION TURBINE AT THE GREEN RIVER GENERATING STATION AND A SOLAR PHOTOVOLTAIC FACILITY AT THE E.W. BROWN GENERATING STATION	)	**CASE NO. 2014-00002**

SUPPLEMENTAL TESTIMONY OF
DAVID S. SINCLAIR
VICE PRESIDENT, ENERGY SUPPLY AND ANALYSIS
KENTUCKY UTILITIES COMPANY
AND LOUISVILLE GAS AND ELECTRIC COMPANY

Filed: August 22, 2014

Section 1 - Introduction and Overview

Q. Please state your name, position, and business address.

A. My name is David S. Sinclair. I am Vice President, Energy Supply and Analysis for Louisville Gas and Electric Company ("LG&E") and Kentucky Utilities Company ("KU") (collectively, "Companies") and an employee of LG&E and KU Services Company, which provides services to LG&E and KU. My business address is 220 West Main Street, Louisville, Kentucky 40202.

Q. Have you previously testified before the Kentucky Public Service Commission ("the Commission") in this case?

A. Yes. I have previously filed direct testimony in this case on January 17, 2014 in which I sponsored the following exhibit, among others:

Exhibit DSS-1:	2013 Resource Assessment ("Resource Assessment") – an analysis of alternatives for meeting the Companies' future capacity and energy needs.

I am also sponsoring the following exhibits with this testimony.

Supplemental Exhibit DSS-1:	Impact of Departing Municipals' Load on the 2013 Load Forecast
Supplemental Exhibit DSS-2:	Low Load Forecast vs. 2013 LF Adjusted for Departing Municipals' Load – Peak Demand and Energy Requirements After DSM
Supplemental Exhibit DSS-3:	Annual Levelized Revenue Requirements for Brown Solar Facility

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to: (i) update the Commission on developments related to the wholesale contract termination by nine Kentucky municipal utilities

("Departing Municipals")[1] served by KU, (ii) describe the impact their decision has on the Companies' request to construct a new approximately 700 MW 2x1 natural gas combined cycle ("NGCC") combustion turbine generating unit at KU's Green River Station ("Green River 2x1 NGCC unit") and to construct a 10 MW solar photovoltaic facility at the E.W. Brown Station ("Brown Solar Facility"), (iii) inform the Commission that the Companies are withdrawing their application for a Certificate of Public Convenience and Necessity ("CPCN") application for the Green River 2x1 NGCC unit, and (iv) recommend that the Commission approve the proposed construction of the Brown Solar Facility.

Section 2 – Update on Wholesale Contract Termination

Q. On May 5, 2014, the Commission granted the Companies' motion requesting that the procedural schedule in this case be held in abeyance for up to 90 days while the Companies analyzed the impact of the termination notice provided by the Departing Municipals on the need for the proposed facilities. Please describe what has transpired during the abeyance period.

A. KU met on several occasions with the Departing Municipals in an attempt to reach a settlement agreement in the Federal Energy Regulatory Commission ("FERC") rate case that would cause them to rescind their termination notice. Unfortunately, those efforts were not successful. On July 7, KU sent a letter to each of the Departing Municipals accepting their decision to terminate and informing them of the steps KU

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[1] On April 21, 2014, KU received notices of termination from nine municipal wholesale customers: Barbourville, Bardwell, Berea, Corbin, Falmouth, Frankfort, Madisonville, Paris, and Providence. All of these customers will terminate service at midnight April 30, 2019, except for Paris which will terminate on April 30, 2017.

would be taking towards a smooth transition. One of those steps was adjusting KU's long-range generation plan to reflect the Departing Municipals' termination as of midnight April 30, 2019 (April 30, 2017 for Paris). KU continues to have settlement discussions regarding the rates and terms for service through their respective termination dates.

Q. Have you reached an agreement to continue service for cities that did not provide a termination notice?

A. Yes. KU reached an agreement with two municipal customers that had not provided notice – Bardstown and Nicholasville – under terms that will result in them not seeking to terminate their contracts. The settlement agreement and amended contracts were filed at FERC on July 29. The combined load of these two municipal customers is about 80 MW and 400,000 MWh annually. Under the amended contract, Bardstown and Nicholasville continue to have the right to provide a five year termination notice but with certain limitations should KU file a CPCN for generating resources over 100 MW.

Q. Please describe the impact that the Departing Municipals' decision to terminate service has the Companies' load forecast.

A. Except for Paris, the Departing Municipals will remain KU customers through midnight April 30, 2019.[2] After their departure, the Companies' peak load will decrease by approximately 325 MW and annual energy requirements will decrease by approximately 1,700 GWh. Supplemental Exhibit DSS-1 shows the impact of the

[2] The City of Paris will terminate on April 30, 2017. Their load is approximately 15 MW, of which 12 has historically been interruptible.

Departing Municipals' load on the 2013 load forecast ("2013 LF"). Supplemental Exhibit DSS-2 shows the revised 2013 LF with the Departing Municipals' load excluded.

Q. After removing the Departing Municipal load from the 2013 LF, how does this compare to the Low load forecast scenario from the Resource Assessment?

A. From 2019 through the middle of the next decade, the revised 2013 LF without the Departing Municipals' load is very similar to, but somewhat greater than, the Low load forecast shown in Table 6 on page 10 of Exhibit DSS-1.[3] Figures 1 and 2 show the impact of removing the Departing Municipals' from the 2013 LF as compared to the 2013 LF High, Base and Low load forecasts for energy and peak demand, respectively. As you can see, removing the Departing Municipals' load from the 2013 LF results in a forecast that is very similar in the next 10 years or so, albeit somewhat greater than, the Low load forecast. The detailed data and year-by-year comparison is shown in Supplemental Exhibit DSS-2.

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[3] See Table 6 on page 94 of the Joint Application testimony and exhibits in Case No. 2014-00002 at http://psc.ky.gov/pscecf/2014-00002/rick.lovekamp@lge-ku.com/01172014091513/LGE_KU_CPCN_App_Test_Exh_1-17-14.pdf.

Figure 1 – 2013 LF Energy Requirements Scenarios and Base adjusted for Departing Municipals

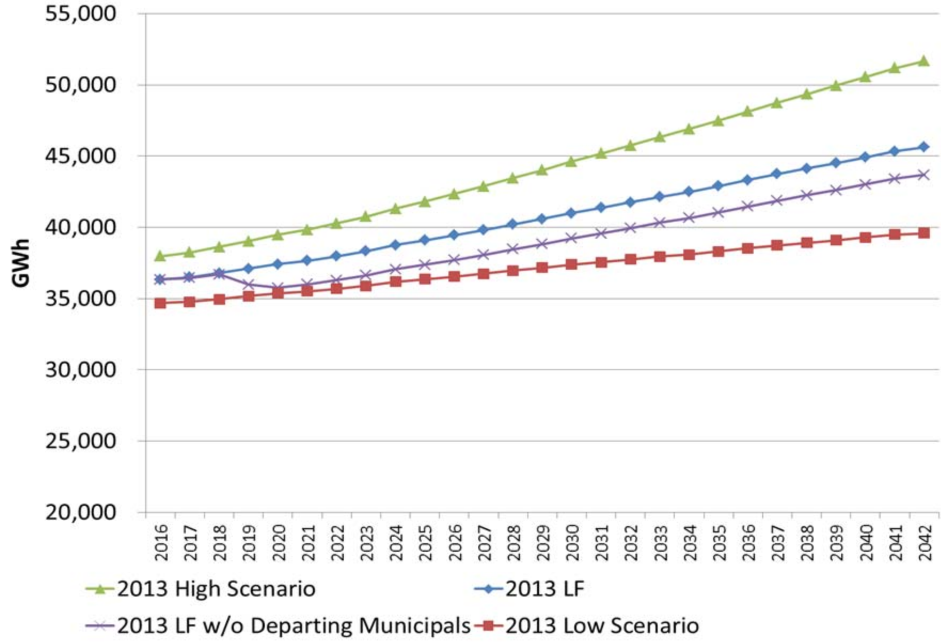
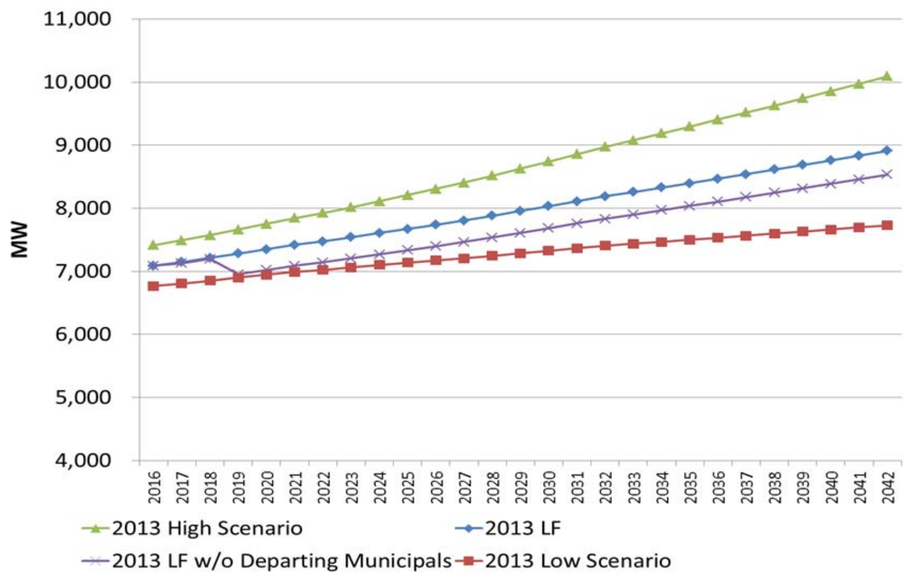


Figure 2 – 2013 LF Peak Demand Scenarios and Base adjusted for Departing Municipals



Q. Does termination by the Departing Municipals require the Companies to produce a new load forecast and develop a new resource assessment to replace the one that was previously filed as Exhibit DSS-1?

A. No. As I just stated, removing the load of the Departing Municipals from the 2013 LF results in a load forecast that is similar enough to the Low load forecast that has already been evaluated in the Resource Assessment. Because all of the resource alternatives have been evaluated against the Low load forecast, there is no reason to develop a new resource assessment.

Q. In your professional opinion, in light of the termination of future service by the Departing Municipals, is using the 2013 LF Low load forecast a reasonable basis on which to evaluate whether or not the Green River 2x1 NGCC unit and Brown Solar Facility are robust options to reliably and economically meet customers' future energy needs?

A. Yes. While the Low load forecast was developed to evaluate the risk around the Base 2013 LF, because of the decision by the Departing Municipals to terminate their contracts, the Companies now know that through the middle of the next decade, future load is likely to be closer to the Low load forecast from 2019 onward. Therefore, it is appropriate to examine the proposed resource alternatives using the Low load forecast.

<u>Section 3 – Need for Capacity and Energy after the Departing Municipals Terminate Service</u>

Q. What is the Companies' target reserve margin?

A. As I stated in my Direct Testimony, based on the Companies' 2011 Integrated Resource Plan ("IRP"), a reserve margin in the range of 15 percent to 17 percent would be preferable.[4] However, since this case was filed, the Companies' have filed the 2014 IRP with the Commission. Based on this more recent analysis, the Companies recommend maintaining a 16 percent to 21 percent reserve margin to reliably meet our customers' peak demand.[5]

Q. Based on the 2013 LF Low load forecast and the 2011 IRP reserve margin target range, when will the Companies need additional capacity?

A. Table 1 shows the Companies' forecasted reserve margin using the Low load scenario starting in 2019 to represent the reduction for the Departing Municipals' load. As you can see, the Companies would be expected to fall below the upper end of the range by 2020 and would be below the minimum level by 2023.

Table 1 – LG&E/KU Resource Summary (MW, Summer, 2013 LF in 2015-2018, Low load forecast begins in 2019)

	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Forecasted Peak Load	7,426	7,509	7,597	7,696	7,366	7,414	7,458	7,492	7,534	7,576	7,612
Energy Efficiency/DSM	(386)	(418)	(450)	(482)	(464)	(466)	(467)	(469)	(471)	(473)	(475)
Net Peak Load	7,040	7,091	7,147	7,214	6,902	6,948	6,991	7,023	7,063	7,103	7,137
Existing Resources[6]	7,814	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796
Firm Purchases (OVEC)	152	152	152	152	152	152	152	152	152	152	152
Curtailable Load	137	137	137	137	137	137	137	137	137	137	137
Total Supply	8,103	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085
Reserve Margin ("RM")	15.1%	14.0%	13.1%	12.1%	17.1%	16.4%	15.6%	15.1%	14.5%	13.8%	13.3%
RM Shortfall (17% RM)*	(134)	(212)	(277)	(355)	10	(44)	(94)	(132)	(179)	(226)	(265)
RM Shortfall (15% RM)*	7	(71)	(134)	(211)	148	95	45	9	(37)	(83)	(123)

*Negative values reflect reserve margin shortfall.

[4] Direct Testimony of David S. Sinclair, page 16, lines 20-22.
[5] See the Companies' *2014 Reserve Margin Study* filed as part of the 2014 IRP at http://psc ky.gov/pscecf/2014-00131/rick.lovekamp@lge-ku.com/04212014122553/Volume_III_REDACTED.pdf.
[6] 'Existing Resources' reflects the retirement of Tyrone Unit 3, Green River Units 3 and 4, and Cane Run Units 4, 5, and 6 and the addition of Cane Run Unit 7.

Q. If the Companies were to proceed with the Green River 2x1 NGCC unit in 2018 as proposed in this case, what would the Companies' reserve margin be in the future?

A. Table 2 shows the Companies' forecasted reserve margin including the Green River 2x1 NGCC unit's capacity. This demonstrates that if the Companies proceed with the Green River 2x1 NGCC unit despite the termination of the Departing Municipals, the forecasted reserve margin would be well above the Companies' target range through 2025.

Table 2 – LG&E/KU Resource Summary with Green River 2x1 NGCC Unit (MW, Summer, 2013 LF in 2015-2018, Low load forecast begins in 2019)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Forecasted Peak Load	7,426	7,509	7,597	7,696	7,366	7,414	7,458	7,492	7,534	7,576	7,612
Energy Efficiency/DSM	(386)	(418)	(450)	(482)	(464)	(466)	(467)	(469)	(471)	(473)	(475)
Net Peak Load	7,040	7,091	7,147	7,214	6,902	6,948	6,991	7,023	7,063	7,103	7,137
Existing Resources[7]	7,814	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796	7,796
Green River 2x1 NGCC unit[8]				670	670	670	670	670	670	670	670
Firm Purchases (OVEC)	152	152	152	152	152	152	152	152	152	152	152
Curtailable Load	137	137	137	137	137	137	137	137	137	137	137
Total Supply	8,103	8,085	8,085	8,755	8,755	8,755	8,755	8,755	8,755	8,755	8,755
Reserve Margin ("RM")	15.1%	14.0%	13.1%	21.4%	26.8%	26.0%	25.2%	24.7%	24.0%	23.3%	22.7%
RM Shortfall (17% RM)*	(134)	(212)	(277)	315	680	626	576	538	491	444	405
RM Shortfall (15% RM)*	7	(71)	(134)	459	818	765	715	679	633	587	547

*Negative values reflect reserve margin shortfall.

Q. Based solely on these forecasted reserve margins, would you recommend that the Companies proceed with constructing the Green River 2x1 NGCC unit at this time?

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[7] 'Existing Resources' reflects the retirement of Tyrone Unit 3, Green River Units 3 and 4, and Cane Run Units 4, 5, and 6 and the addition of Cane Run Unit 7.

[8] As discussed elsewhere in this case, the exact capacity of the Green River 2x1 NGCC unit would be determined during the equipment selection process.

A. No. If reserve margin is the only consideration, I do not recommend that the Companies proceed with constructing the Green River 2x1 NGCC unit in 2018. As shown in Table 1, with the loss of the Departing Municipals' load, the Companies are above the minimum of their target reserve margin until 2021. Likewise, as I just stated, Table 2 shows that proceeding with Green River 2x1 NGCC unit at this time would result in a reserve margin that is well above the upper end of the target reserve margin for an extended period of time. My recommendation is to postpone any long-term resource commitments at this time and address future resource needs in the course of the Companies' annual planning process or in the Companies' next IRP which will be filed in April 2017.

Q. On page 30, lines 14-16 of your January 17, 2014 Direct Testimony, you stated that constructing the Green River 2x1 NGCC unit to be in service by 2018 was "…the lowest PVRR based on the weighting of all scenarios." If that is the case, why shouldn't the Companies proceed with constructing the Green River 2x1 NGCC unit to be in service by 2018?

A. As I previously stated, the fact that the Departing Municipals have terminated their power contracts means that future load is much more likely to be like the Low load forecast than the Base 2013 LF through the middle of the next decade. The analysis which that statement is based on assumed that there was only a 20 percent chance that future load could turn out to be like the Low load forecast. That probability is now much greater so it is much more appropriate to look at the present value revenue requirements ("PVRR") associated with the Low load forecast.

Q. In that case, looking at Table 33 of the Resource Assessment, isn't it true that constructing the Green River 2x1 NGCC unit to be in service by 2018 has the lowest PVRR in the Low load forecast cases?

A. Yes. However, that analysis assumes that the Companies made a long-term resource commitment of some kind in 2018 and load turned out to be like the Low load forecast over time. In other words, constructing Green River 2x1 NGCC unit to be in service by 2018 would have been the best decision, compared to other long-term resource alternatives, had load in the future turned out to be much lower than was forecasted. For example, had the Departing Municipals given KU a termination at some future date after the Green River 2x1 NGCC unit was in service, constructing the unit would have been the least regretful resource compared to the other options. But, now that the Companies know the Departing Municipals are terminating, it does not make sense to construct a unit well in advance of any reliability or energy need.

Q. Is there any other basis on which the Companies could have tried to justify constructing Green River 2x1 NGCC unit by the summer of 2018?

A. Yes. The Companies could have tried to justify constructing the Green River 2x1 NGCC unit as part of a strategy to comply with future CO_2 regulations on existing generating units. On June 2, 2014, the U.S. Environmental Protection Agency ("EPA") issued proposed CO_2 regulations covering existing fossil fueled units with interim compliance beginning in 2020. Under the proposed regulations, EPA will finalize the federal rule by June 2015 and Kentucky will need to finalize its compliance plan by 2016. At this time, there is tremendous uncertainty regarding the proposed regulations involving both federal and state issues. The Companies will be monitoring the development of the proposed regulations and will develop a compliance plan once more certainty exists regarding their compliance obligations. Given the proposed timing of the regulations, it is likely that they will be an important consideration in the development of the 2017 IRP. Because not enough information is currently known about these proposed CO_2 regulations, it is too soon to propose constructing the Green River 2x1 NGCC unit based solely on speculation of its impact on a future compliance strategy.

Q. If the Companies do not proceed with the construction of Green River 2x1 NGCC unit by summer of 2018, won't the Companies have a reserve margin deficit in that year before the Departing Municipals terminate service?

A. Yes. As can be seen in Table 1, without the Green River 2x1 NGCC unit in 2018, the Companies' forecasted reserve margin is only 12.1 percent which is 211 MW below the 15 percent minimum reserve margin (based on the 2011 IRP). To address this shortfall, as well as the low reserve margin in 2015 through 2017, in May 2014, the Companies issued an RFP for short-term capacity and energy. The Companies are currently working on a purchase power agreement with one of the respondents to ensure adequate capacity and energy until the Departing Municipals leave the system in May 2019.

Section 4 – Impact of termination by the Departing Municipals on Brown Solar Facility

Q. Does the termination of the Departing Municipals impact the economics to customers of the Brown Solar Facility?

A. No. As can be seen in Tables 34 through 37 of the Resource Assessment, the PVRR impact of the Brown Solar Facility in the Low Load cases is no different than the

PVRR impact of the project across the average of all cases. In the Low load forecast case, construction of the Brown Solar Facility would only slightly increase system PVRR or would break even should renewable energy certificate ("REC") prices be at or above $57. The economics of Brown Solar Facility continue to be based on: (i) the marginal fuel cost savings of generation that it displaces (ii) the ability to capture the investment tax credit by having the facility completed by December 31, 2016, (iii) the value of RECs that can be sold in other states, (iv) a hedge against an increase in future natural gas prices, and (v) the ability to reduce potential future CO_2 compliance costs. With the possible exception of marginal fuel cost savings, none of these are impacted by the loss of load of the Departing Municipals or the decision not to construct Green River 2x1 NGCC unit to be in service by 2018.

Q. How will the loss of Departing Municipals' load impact the marginal fuel savings of the Brown Solar Facility?

A. It will have no material impact on the marginal fuel savings of the Brown Solar Facility. As shown in Tables 34 through 37, the impact of the Brown Solar Facility on the PVRR of the system revenue requirements is virtually identical in both the Base Load and Low Load cases. Since the energy generated by Brown Solar is the same regardless of load,[9] the variable operating costs and REC revenue are unchanged in the Base Load and Low Load cases. Therefore, the fact that the total impact of the Brown Solar Facility on system PVRR is identical (to the nearest million dollars as shown in Tables 34 through 37) for a given REC price for both the

[9] A solar photovoltaic plant is not dispatched to meet load and will produce energy based on the amount of sunlight. The Brown Solar Facility is expected to produce approximately15,000 MWh annually. See response to PSC 1-28 in the Commission Staff's first information request for more details on the expected energy production profile of the Brown Solar Facility.

Base Load and Low Load cases means that the loss of the Departing Municipals' load will not materially impact the marginal fuel cost savings of the project.

Q: If the economics of the Brown Solar Facility are unaffected by (i) the termination of the Departing Municipals and (ii) not proceeding with constructing the Green River 2x1 NGCC unit at this time, are there any other reasons why the Companies are recommending construction of the Brown Solar Facility?

A. Yes. As stated in the Resource Assessment, the cost of photovoltaic ("PV") solar resources has been trending lower in recent years and is expected by many to continue to do so in the future. Moving forward with Brown Solar Facility now will afford the Companies an opportunity to gain operational experience with this type of resource should the economics continue to improve and future CO_2 regulations enhance their value to the system.

Q. You have testified that the Brown Solar Facility will have a small impact on the PVRR of the total system revenue requirements. What is the approximate impact of the project on annual system revenue requirements?

A. The annual revenue requirement impact of the Brown Solar Facility will consist of the capital (net of the investment tax credit) and O&M cost of the project offset by the marginal fuel cost savings of generation that it displaces and revenue from the sale of RECs. While the revenue requirements of just the capital and O&M costs will be very stable from year-to-year ranging from [redacted] to [redacted] in the early years of the project, the offsetting fuel savings and REC revenue will be much more variable. Supplemental Exhibit DSS-3 contains tables that illustrate the levelized annual revenue requirement impact of the project based on various combinations of capital costs, marginal fuel cost savings, and REC prices. As you can see, the levelized annual revenue requirement impact of the Brown Solar Facility is approximately [redacted] increase to [redacted] decrease in total system revenue requirements depending on the ultimate capital cost of the project, avoided energy cost savings which might include the value of CO_2 emissions, and REC prices.

<u>Section 5 – Ownership Share for the Brown Solar Facility</u>

Q. What is the recommended ownership allocation between LG&E and KU for the Brown Solar Facility?

A. It is recommended that LG&E own 39 percent of the Brown Solar Facility and that KU own 61 percent of the Brown Solar Facility.

Q. How was this ownership allocation determined?

A. For the Brown Solar Facility, the ownership share was determined based on LG&E's and KU's shares of forecasted load during daylight hours because that is when the Brown Solar Facility will be generating electricity. This allocation was impacted by the termination of the Departing Municipals which will reduce KU's load and so has been updated from what was presented in the Resource Assessment.

<u>Section 7 – Summary and Recommendation</u>

Q. Please summarize why the Companies are proposing to withdraw their request to construct the Green River 2x1 NGCC unit and proceed with the construction of the Brown Solar Facility.

A. The decision by the Departing Municipals will significantly reduce the Companies' native load beginning May 2019 by approximately 325 MW at time of summer peak.

This loss of load defers the need for future generating capacity and energy until 2021 at the earliest. Therefore, the Companies do not think that the Green River 2x1 NGCC unit needs to be constructed to be in service by 2018. Furthermore, once more is known about the recently proposed CO_2 regulations on existing generators, it makes sense to evaluate the need for future generating assets like Green River 2x1 NGCC unit in the context of a broader analysis relating to the impact and timing of those proposed regulations. Finally, the economics of and rationale for constructing the Brown Solar Facility are unaffected by the termination of the Departing Municipals and not constructing the Green River 2x1 NGCC unit by 2018.

Q. What is your recommendation to the Commission?

A. Based on my testimony and the analyses performed under my direction and discussed in the Resource Assessment, it is my recommendation that the Commission should approve the Brown Solar Facility to ensure adequate generating capacity and low-cost energy.

Q. Does this conclude your testimony?

A. Yes it does.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
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 foregoing testimony, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

David S. Sinclair

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 22nd day of August 2014.

Sheri L. Gardner (SEAL)
Notary Public

My Commission Expires:

SHERI L. GARDNER
Notary Public, State at Large, KY
My Commission expires Dec. 24, 2017
Notary ID # 501600

Supplemental Exhibit DSS-1: Impact of Departing Municipals' Load on 2013 LF[10]

	Peak Demand (MW)	Energy Requirements (GWh)
2015	0	0
2016	0	(2)
2017	(16)	(58)
2018	(16)	(83)
2019	(325)	(1,127)
2020	(327)	(1,654)
2021	(329)	(1,666)
2022	(331)	(1,678)
2023	(334)	(1,691)
2024	(336)	(1,704)
2025	(338)	(1,716)
2026	(341)	(1,729)
2027	(343)	(1,741)
2028	(345)	(1,754)
2029	(347)	(1,767)
2030	(349)	(1,780)
2031	(351)	(1,793)
2032	(354)	(1,806)
2033	(356)	(1,820)
2034	(358)	(1,833)
2035	(360)	(1,847)
2036	(363)	(1,861)
2037	(365)	(1,874)
2038	(367)	(1,888)
2039	(369)	(1,902)
2040	(372)	(1,917)
2041	(374)	(1,931)
2042	(376)	(1,945)

[10] The data includes the termination of the City of Benham, KY (approximately 2 MW and 7 GWh), which is effective in August 2016. Their upcoming termination was the result of a settlement reached in a prior case at FERC involving an event of default by Benham. Termination for the City of Paris, KY is effective April 30, 2017. The remaining Departing Municipals' terminations are effective April 30, 2019.

Supplemental Exhibit DSS-2: Low Load Forecast vs. 2013 LF Adjusted for Departing Municipals' Load – Peak Demand and Energy Requirements After DSM

	2013 LF Adjusted for Departing Municipals' Load		Low Load Forecast		Difference (Low Load less Adjusted 2013 LF)	
	Peak Demand (MW)	Energy Requirements (GWh)	Peak Demand (MW)	Energy Requirements (GWh)	Peak Demand (MW)	Energy Requirements (GWh)
2016	7,091	36,333	6,767	34,690	324	1,642
2017	7,131	36,445	6,805	34,766	326	1,679
2018	7,198	36,705	6,854	34,960	344	1,745
2019	6,957	35,974	6,902	35,173	55	801
2020	7,023	35,767	6,948	35,379	75	389
2021	7,089	36,003	6,991	35,504	98	499
2022	7,143	36,304	7,023	35,693	120	611
2023	7,206	36,632	7,063	35,899	143	732
2024	7,270	37,048	7,103	36,187	167	861
2025	7,335	37,367	7,137	36,355	198	1,012
2026	7,398	37,715	7,172	36,551	226	1,165
2027	7,463	38,065	7,206	36,743	257	1,321
2028	7,536	38,457	7,247	36,971	289	1,486
2029	7,610	38,815	7,287	37,159	323	1,656
2030	7,685	39,224	7,327	37,393	358	1,831
2031	7,760	39,571	7,366	37,559	394	2,012
2032	7,834	39,940	7,405	37,748	429	2,192
2033	7,901	40,320	7,436	37,943	465	2,377
2034	7,970	40,661	7,467	38,096	503	2,564
2035	8,038	41,047	7,500	38,300	538	2,747
2036	8,106	41,472	7,533	38,536	573	2,936
2037	8,176	41,866	7,565	38,737	611	3,129
2038	8,246	42,237	7,597	38,916	649	3,320
2039	8,316	42,616	7,630	39,101	686	3,515
2040	8,388	43,003	7,664	39,295	724	3,709
2041	8,460	43,407	7,699	39,503	761	3,904
2042	8,534	43,682	7,731	39,579	803	4,103

CONFIDENTIAL INFORMATION REDACTED

Supplement Exhibit DSS-3:

Annual Levelized Revenue Requirement ($000s) – Brown Solar ($2,400/kW Capital Cost)

		Avoided Energy Cost during Daylight Hours ($/MWh)						
		40	50	60	70	80	90	100
Renewable Energy Cert. Price ($/REC)	0	[redacted]						
	16	[redacted]						
	26	[redacted]						
	57	[redacted]						
	62	[redacted]						
	79	[redacted]						

Annual Levelized Revenue Requirement ($000s) – Brown Solar ($3,500/kW Capital Cost)

		Avoided Energy Cost during Daylight Hours ($/MWh)						
		40	50	60	70	80	90	100
Renewable Energy Cert. Price ($/REC)	0	[redacted]						
	16	[redacted]						
	26	[redacted]						
	57	[redacted]						
	62	[redacted]						
	79	[redacted]						

Annual Levelized Revenue Requirement ($000s) – Brown Solar ($3,600/kW Capital Cost)

		Avoided Energy Cost during Daylight Hours ($/MWh)						
		40	50	60	70	80	90	100
Renewable Energy Cert. Price ($/REC)	0	[redacted]						
	16	[redacted]						
	26	[redacted]						
	57	[redacted]						
	62	[redacted]						
	79	[redacted]						

Annual Levelized Revenue Requirement ($000s) – Brown Solar ($4,100/kW Capital Cost)

		Avoided Energy Cost during Daylight Hours ($/MWh)						
		40	50	60	70	80	90	100
Renewable Energy Cert. Price ($/REC)	0	[redacted]						
	16	[redacted]						
	26	[redacted]						
	57	[redacted]						
	62	[redacted]						
	79	[redacted]						