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FPSC - COMMISSION CLERK

June 22, 2020

Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
Attn: Adam Teitzman

Re: Forecast-related answers to Data Request #1

Dear Mr. Teitzman,

Pursuant to Section 186.801, Florida Statutes and Rules 25-22.070-072 of Florida Administrative Code, Lakeland Electric hereby submits our forecast-related answers to Data Request #1, including information relevant to question #7 and #11.

If you have any questions please do not hesitate to contact me at 863-834-6612.

Sincerely,

Cynthia Clemmons
City of Lakeland
Manager of Legislative and Regulatory Relations
Lakeland Electric
863-834-6595 Work
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501 E Lemon St.
Lakeland, Florida 33801

Enclosure

FORECAST Qs 2020 LE TYSP DATA REQUEST #1 Qs

6/22/2020 Note by data responder: these responses are being made relative to 2020 Ten Year Site Plan which was generated prior to COVID-19. All trends reflected anticipated trends prior to COVID-19.

7. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on the monthly peak demand experienced during the three-year period prior to the current planning period, including the actual peak demand experienced, the amount of demand response activated during the peak, and the estimated total peak if demand response had not been activated. Please also provide the day, hour, and system-average temperature at the time of each monthly peak.

TYSP Year	2020
Staff's Data Request #	1
Question No.	7

Year	Month	Actual Peak Demand (MW)	Demand Response Activated (MW)	Estimated Peak Demand (MW)	Day	Hour	System-Average Temperature (Degrees F)
2019	1	545	0	684	29	8	51
	2	486	0	581	22	17	83
	3	496	0	498	11	18	81
	4	535	0	546	30	18	84
	5	636	0	602	30	17	95
	6	667	0	628	25	17	96
	7	647	0	645	16	17	92
	8	632	0	638	26	17	92
	9	647	0	609	9	17	95
	10	582	0	572	4	17	92
	11	521	0	469	7	16	87
	12	436	0	510	19	8	45
2018	1	701	0	677	18	8	29.7
	2	486	0	576	26	16	84.3
	3	454	0	492	29	18	83
	4	513	0	541	9	18	83.3
	5	579	0	596	24	17	87
	6	623	0	623	19	17	92.3
	7	625	0	639	2	18	88
	8	634	0	633	8	17	91.7
	9	639	0	603	17	17	92.2
	10	608	0	568	16	17	89.6
	11	522	0	465	7	16	87.4
	12	503	0	505	12	8	47
2017	1	534	0	677	9	8	46.1
	2	459	0	570	28	17	83.1
	3	498	0	478	29	18	87.3
	4	586	0	537	28	18	90.3
	5	610	0	595	30	17	88.6
	6	615	0	624	30	17	87
	7	644	0	641	26	17	94.9
	8	640	0	635	9	18	93.6
	9	618	0	605	26	17	90.9
	10	591	0	568	9	17	87.8
	11	461	0	458	8	16	83.1
	12	515	0	498	11	8	44.9

Notes * Provided June 22, 2020.

(Include Notes Here)

8. Please identify the weather station(s) used for calculation of the system-wide temperature for the Company's service territory. If more than one weather station is utilized, please describe how a system-wide average is calculated.

The weather information is obtained from Lakeland Electric's own weather stations. Several weather stations are strategically placed throughout Lakeland's electric service territory to provide the best estimate of overall temperature for the service area. The data from these weather stations is averaged for the month, day, highs and lows.

9. Please explain, to the extent not addressed in the Company's current planning period TYSP, how the reported forecasts of the number of customers, demand, and total retail energy sales were developed. In your response, please include the following information: methodology, assumptions, data sources, third-party consultant(s) involved, anticipated forecast accuracy, and any difference/improvement made compared with those forecasts used in the Company's most recent prior TYSP.

Methodology and assumptions

- Lakeland explains the methodology and assumptions used to develop the load and demand forecast in Section 3.0 "Forecast of Electrical Power Demand and Energy Consumption" of the 2020 TYSP.

Data Sources

- Lakeland's own weather stations
- Customer Billing System Data
- SCADA Hourly Load Data/Solar
- Census Data

Third Party Consultants

- Moody's Analytics for demographic/economic projections
- Woods and Poole for demographic/economic projections
- Bureau of Business and Economic Research for demographic projections
- Itron's Energy Forecasting Group for appliance indices
- Itron's expertise for forecast review

Forecast Improvements/Changes

- No significant changes since 2019 forecast.

Anticipated Forecast Accuracy

Forecast error fans are provided for customer, sales, summer peak and winter peak in spreadsheet titled LAK2020TYSP_SUP1_ErrorFans.xlsx.

Lakeland relies on nationally recognized forecast vendors for economic and demographic projections. Around the time of the 2007-2009 recession, most forecast vendors underestimated the extent and length of the recession and the projections they published were overly optimistic.

It is only around 2012 that the vendor projections were revised downwards. If one reviews the error fans, there is a clear difference in forecast accuracy prior to 2012 and afterwards – this is particularly evident in the customer forecast.

Prior to COVID, Lakeland anticipated accuracy of current forecast to be consistent with that of prior forecasts created in most recent five years.

10 Please identify all closed and open Florida Public Service Commission (FPSC) dockets and all non-docketed FPSC matters which were/are based on the same load forecast used in the Company's current planning period TYSP.

Lakeland does not have any open or closed FPSC dockets, or non-docketed FPSC matters currently based on the load forecast used in the 2020 TYSP.

11 Please explain if your Company evaluates the accuracy of its forecasts of customer growth and annual retail energy sales presented in its past TYSPs by comparing the actual data for a given year to the data forecasted one, two, three, four, five, or six years prior.

A If your response is affirmative, please explain the method used in your evaluation, and provide the corresponding results, including work papers, in Microsoft Excel format for the analysis of each forecast presented in the TYSPs filed with the Commission during the 20-year period prior to the current planning period. If your Company limits its analysis to a period shorter than 20 years prior to the current planning period, please provide what analysis you have and a narrative explaining why your Company limits its analysis period.
B If your response is negative, please explain why.

Lakeland generates a new load forecast every year. As part of the forecasting process, the forecast accuracy of the previous forecast is evaluated. Sales and peak values are weather normalized and forecast variance is assessed relative to actual values as well as relative to weather normalized values in order to determine underlying trends.

Spreadsheet titled LAK2020TYSP_SUP1_ErrorFans.xlsx contains both actual and weather normalized values where applicable. As discussed in response to question 9 A, emphasis is placed on forecasts generated since 2012.

12 Please explain if your Company evaluates the accuracy of its forecasts of Summer/Winter Peak Energy Demand presented in its past TYSPs by comparing the actual data for a given year to the data forecasted one, two, three, four, five, or six years prior.

A If your response is affirmative, please explain the method used in your evaluation, and provide the corresponding results, including work papers, in Microsoft Excel format for the analysis of each forecast presented in the TYSPs filed with the Commission during the 20-year period prior to the current planning period. If your Company limits its analysis to a period shorter than 20 years prior to the current

planning period, please provide what analysis you have and a narrative explaining why your Company limits its analysis period.

B If your response is negative, please explain why.

Please see response to question 11.

13 Please explain any historic and forecasted trends in:

A Growth of customers, by customer type (residential, commercial, industrial) as well as Total Customers, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

Residential

Florida as a whole has benefited from being a state that does not tax income and its population has grown in part as a result of migration from other states mostly located in the Northeast. This phenomenon is strongest among individuals of retirement age.

During the 2007-2009 recession, Florida saw a drop in population growth as the rate of foreclosures increased sharply and work dried up. However, since then, population growth has resumed.

MSAs along the Florida coast lines have typically grown faster than inland and they are more densely populated. But inland MSAs have a lower cost of living thanks to lower housing costs. As the coastal MSAs have expanded, the inland MSAs have benefited from their growth. This has been the case of the Lakeland-Winter Haven MSA which is situated along the I-4 Corridor that connects Orlando to Tampa.

In recent years, the Lakeland Winter Haven MSA (Polk County) has seen a boom in e-commerce warehouse development thanks to its central location. In addition, the local business community is very active in promoting central Florida and pushing for a diversity of industries to relocate there. Those efforts have been paying off for the Lakeland Winter Haven MSA in general and the Lakeland Electric service area specifically. In general, population growth in our service area is lower than in parts of the county closer to either Orlando or Tampa. Nonetheless, year over year growth has been consistent, particularly in the most recent 5 years, as average annual growth rates below show:

2009-2013 Residential Customer AAGR: 0.2%
2014-2018 Residential Customer AAGR: 1.4%
2020-2029 Residential Customer Forecasted AAGR: 1.3%

Our customer forecast uses Moody's analytics and also cross references locally produced forecasts from the Bureau of Economic and Business Research associated with the University of Florida.

Commercial and Industrial

Commercial and Industrial customers are addressed as a unit. This is because our Industrial customer rate class, which includes customers with a maximum monthly billing demand over 500 KW and up to 20,000 KW is composed of only about 25% manufacturing customers. The remainder of our Industrial rate class customers are in building types that are considered commercial according to the EIA classification of building types. Lakeland Service Area had

an annual high of 87 Industrial customers back in 2008. Since then, the count has dropped to 75. For the most part, this is not because the Industrial customers have closed shop but rather because their rate class has changed to Commercial because of a decrease in electric consumption. The electric consumption decrease is attributed to CFL and LED lighting upgrades as well as other upgrades to more energy efficient equipment and appliances.

As a result of the Industrial customer rate migration to the Commercial rate class as well as growth in the Commercial rate class that paralleled residential growth, the Commercial rate class category has experienced significant growth in the last 5 years after several years of decline following the 2007-2009 recession. The Commercial customer class is expected to grow in parallel with the residential growth in the 10 year forecast horizon, though at a slightly lower rate than Residential customers.

2009-2013 Commercial Customer AAGR: -0.1%
2014-2018 Commercial Customer AAGR: 1.1%
2020-2029 Commercial Customer Forecasted AAGR: 1.1%

Industrial monthly customers reached their lowest point in 2017 when their count was 72. Industrial customers averaged 75 in 2019. They are forecasted to grow on average 1.1% a year in the 10 year forecast horizon to an annual average of 84 by 2029 – which is still below the high of 87 reached in 2008.

2009-2013 Industrial Customer AAGR: -1.9%
2014-2018 Industrial Customer AAGR: -1.1%
2020-2029 Industrial Customer Forecasted AAGR: 1.1%

B Average KWh consumption per customer, by customer type (residential, commercial, industrial), and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

Lakeland uses Itron Energy Forecasting Group data on Appliance Indices and Building characteristics which is derived from U.S. Energy Information Administration (EIA) research published in its 2018 Annual Energy Outlook (AEO). Lakeland uses the Southeast Census division data and contracts with Itron to adjust the indices based on Lakeland's mix of residential and commercial building types. The EIA projections incorporate expected changes in appliance energy efficiency due to codes and standards as well as general advances in technology.

Residential Average use has been declining in the Lakeland Service area and is expected to continue to decline. The main factors in the decline are increased appliance energy efficiency, improved building shell insulation, changes in residential building type mix.

Commercial Average use has also declined on a weather normalized basis and is expected to continue to do so according to EIA projections used in our models. Main contributors to the historical decline are lighting upgrades, appliance energy efficiency as wall as the use of energy management systems.

Industrial Average use shows an increase because, as discussed in part 13 A, there has been a rate migration of industrial customers into the commercial customer class. The remaining industrial customers are the larger customers and therefore their average use is higher. Lakeland

is forecasting a flattening of Industrial average use mainly because a small number of customers are projected to get added to that rate class and those that do get added are expected to be mostly in the small Industrial category (billing demand between 500 KW and 1,000 KW).

C Total Billed Retail Energy Sales (GWh) **[for FPL]**, or
Net Energy for Load (GWh) **[for other companies]**, identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends. Please include a detailed discussion of how the Company's demand management program(s) and conservation/energy-efficiency program(s) impact the growth/decline of the trends.

As discussed in previous section, average use is declining or flat for all three main rate classes. At this time, Net Energy for Load is expected to grow in the 10 year forecast horizon by 0.9 % a year. This is because positive customer growth rates are expected to compensate for average use declines. Lakeland assumes impact of conservation programs are already in the energy sales history and does not make any additional assumptions regarding their impact.

14 Please explain any historic and forecasted trends in each of the following components of Summer/Winter Peak Demand:

A Demand Reduction due to Conservation and Self Service, by customer type (residential, commercial, industrial) as well as Total Customers, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

Conservation

Conservation impacts are assumed to be reflected in the historical time series.

Self Service – cogeneration non solar

Since Lakeland Electric rates are among the lowest in the state, it is not expected that it would be cost effective for a customer to self serve. No non solar cogeneration is assumed in the models.

Self Service – solar photovoltaic

Lakeland tracks solar photovoltaic installations and generates a net metered forecast. Due to our low electric rates and rate structure, growth of self service solar has been minimal and is expected to continue to be minimal and have negligible impact on demand.

B Demand Reduction due to Demand Response, by customer type (residential, commercial, industrial), and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

Lakeland does not currently have a demand response program in place and no assumptions are made in the forecast regarding demand response.

C Total Demand, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

Lakeland is considered winter peaking. Lakeland's all time annual peak was 804 MW in winter 2010. In recent years, Lakeland has experienced several mild winter seasons. Nonetheless, when Lakeland experiences a cold winter, the peak typically surpasses the summer peak. It is expected that Lakeland will remain winter peaking in the 10 year forecast horizon.

Summer peaks in Lakeland are less volatile than winter peaks and have been growing at a slightly faster pace, on a weather normalized basis.

Factors contributing to the total demand growth rate are same factors discussed in response to question 13.

D Net Firm Demand, by the sources of peak demand appearing in Schedule 3.1 and Schedule 3.2 of the current planning period TYSP, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

Since no reductions are made for Load Management and Conservation, Net Firm Demand is the same as Total Demand. Please see response to question 14 C.

15 Please explain any anomalies caused by non-weather events with regard to annual historical data points for the period 10 years prior to the current planning period that have contributed to the Company's Summer/Winter Peak Energy Demand.

A review of Lakeland's summer and winter peak demand for the ten years prior to the current planning period do not reveal any anomalies caused by non-weather events.

16 Please refer to the Company's respective Utility Perspective section in the Commission's "Review of the 2019 Ten-Year Site Plans of Florida's Electric Utilities." Please answer your Company's respective questions below regarding the growth of customers and retail energy sales, of which the associated figure in the Utility Perspective section is based on the values reported on Schedule 2 of your respective Company's 2019 TYSP:

LAK:

A Please explain, in general, why the Company's growth rate of retail energy sales is projected to lag the growth rate of customers starting in 2020.

Energy efficiency is the main factor contributing to the lag in growth of energy sales relative to customer growth.

B Please explain why the divergence in the growth rates of customers and the retail energy sales is projected to increase during the forecast period.

Based on the EIA data we use for our forecast which incorporates appliance and building shell energy efficiency gains, energy intensity is expected to continue to decrease annually for both our residential and commercial customers, widening the gap between the customer growth rates and the retail sales growth rates.

C Please identify the drivers which contribute to the sharp fall in the growth rate of retail energy sales in the period 2011-2012, and the relatively high growth rates in 2015 and 2018, respectively.

Weather is the main driver in sales variance.

Beyond weather, commercial and industrial customer decline and then growth was another factor in the sales variance. Following the 2007-2009 recession, Lakeland saw a year over year drop in C&I customer counts during the period of 2009 to 2012. The compounded drop in C&I customer counts was another factor in the lower sales in 2012. Since 2012, C&I customer counts have increased year over year and the increased sales in that rate class contributed to higher total sales.

TYSP Year 2020
Staff's Data Request # 1
Question No. 7

Year	Month	Actual Peak Demand (MW)	Demand Response Activated (MW)	Estimated Peak Demand (MW)	Day	Hour	System-Average Temperature (Degrees F)
2019	1	545	0	684	29	8	51
	2	486	0	581	22	17	83
	3	496	0	498	11	18	81
	4	535	0	546	30	18	84
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	6	667	0	628	25	17	96
	7	647	0	645	16	17	92
	8	632	0	638	26	17	92
	9	647	0	609	9	17	95
	10	582	0	572	4	17	92
	11	521	0	469	7	16	87
	12	436	0	510	19	8	45
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	5	579	0	596	24	17	87
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	9	639	0	603	17	17	92.2
	10	608	0	568	16	17	89.6
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	7	644	0	641	26	17	94.9
	8	640	0	635	9	18	93.6
	9	618	0	605	26	17	90.9
	10	591	0	568	9	17	87.8
	11	461	0	458	8	16	83.1
	12	515	0	498	11	8	44.9

Notes * Provided June 22, 2020.

(Include Notes Here)

Winter Peak Demand (MW) Forecast Error Fan

Year	Actual	2008 fcst	2009 fcst	2010 fcst	2011 fcst	2012 fcst	2013 fcst	2014 fcst	2015 fcst	2016 fcst	2017 fcst	2018 fcst	2019 fcst
2009	710	685	680	710	710	710	710	710	710	710	710	710	710
2010	804	693	687	725	804	804	804	804	804	804	804	804	804
2011	709	701	694	733	730	709	709	709	709	709	665	665	665
2012	612	709	699	736	733	612	612	612	612	612	612	612	612
2013	549	717	705	743	740	696	548	553	553	553	553	553	553
2014	577	726	713	751	747	699	675	579	579	579	579	579	579
2015	653	736	723	759	755	703	683	689	675	656	656	656	656
2016	583	746	734	767	762	708	695	702	689	589	589	588	589
2017	534	757	745	775	770	713	703	709	695	690	677	539	539
2018	701	769	756	783	778	718	712	717	703	700	687	704	704
2019	545	-	-	790	785	723	720	725	707	702	695	684	550
2020	-	-	-	-	793	727	726	728	707	702	699	687	687
2021	-	-	-	-	-	731	733	736	711	707	702	688	688
2022	-	-	-	-	-	-	740	743	716	711	710	693	693
2023	-	-	-	-	-	-	-	750	720	718	718	699	699
2024	-	-	-	-	-	-	-	-	726	721	729	707	707
2025	-	-	-	-	-	-	-	-	-	726	735	710	710
2026	-	-	-	-	-	-	-	-	-	-	744	715	715
2027	-	-	-	-	-	-	-	-	-	-	-	721	721
2028	-	-	-	-	-	-	-	-	-	-	-	-	730

	all years											after 2012
Year	Avg. Error	2008 fcst	2009 fcst	2010 fcst	2011 fcst	2012 fcst	2013 fcst	2014 fcst	2015 fcst	2016 fcst	2017 fcst	2018 fcst	Avg. Error
2009	**-3.52%**	-3.52%											
2010	**-14.18%**	-13.81%	-14.55%										
2011	**0.05%**	-1.13%	-2.12%	3.38%									
2012	**17.51%**	15.83%	14.20%	20.25%	19.76%								
2013	**31.30%**	30.71%	28.53%	35.45%	34.91%	26.89%							
2014	**24.48%**	25.78%	23.53%	30.11%	29.42%	21.10%	16.95%						**16.95%**
2015	**10.51%**	12.78%	10.79%	16.31%	15.70%	7.73%	4.66%	5.58%					**5.12%**
2016	**24.34%**	27.88%	25.82%	31.48%	30.62%	21.36%	19.13%	20.33%	18.11%				**19.19%**
2017	**36.37%**	41.70%	39.45%	45.07%	44.13%	33.46%	31.59%	32.71%	30.09%	29.16%			**30.89%**
2018	**3.83%**		7.79%	11.64%	10.92%	2.37%	1.51%	2.23%	0.23%	-0.20%	-2.05%		**0.35%**
2019	**33.15%**			44.95%	44.04%	32.66%	32.11%	33.03%	29.72%	28.81%	27.52%	25.50%	**29.45%**

Overall average forecast error:	**20.16%**
Standard deviation of all errors:	**14.71%**

Overall average forecast error:	**18.42%**
Standard deviation of all errors:	**13.05%**

APE - all TYSPs

Avg. Error	1	yr(s) out	0.80%	n= 11
"	2	yr(s) out	1.24%	n=10
"	3	yr(s) out	1.97%	n= 9
"	4	yr(s) out	2.40%	n= 8
"	5	yr(s) out	2.79%	n= 7
"	6	yr(s) out	3.14%	n= 6
"	7	yr(s) out	3.87%	n= 5
"	8	yr(s) out	4.99%	n= 4
"	9	yr(s) out	6.44%	n= 3

APE - after 2012

Avg. Error	1	yr(s) out	13.32%	n= 6
"	2	yr(s) out	13.74%	n= 5
"	3	yr(s) out	16.18%	n= 4
"	4	yr(s) out	21.18%	n= 3
"	5	yr(s) out	17.27%	n= 2
"	6	yr(s) out	32.11%	n= 1