Jackson Energy Cooperative

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

JACKSON ENERGY COOPERATIVE
A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Jackson Energy Cooperative, located in McKee, Kentucky, is an electric distribution cooperative that serves members in 15 counties. This load forecast report contains Jackson Energy Cooperative's long-range forecast of energy and peak demand.

Jackson Energy Cooperative and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Jackson Energy Cooperative for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Jackson Energy Cooperative. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Jackson Energy Cooperative. Cooperation helps to ensure that the forecast meets both parties' needs. Jackson Energy Cooperative uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Jackson Energy Cooperative is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	708,879	140,224	67,166	916,270	1,094	5.5	970,662
2015	634,503	133,175	63,128	830,807	980	9.9	923,471
2016	681,628	132,583	71,531	885,741	1,096	5.0	933,142
2017	638,874	128,923	70,386	838,183	1,013	5.1	884,344
2018	705,384	137,137	72,953	915,474	1,047	4.9	964,216
2019	677,262	134,285	73,100	884,646	966	4.9	931,455
2020	669,826	130,053	72,723	872,602	979	4.9	918,803
2021	683,725	142,461	77,255	903,441	964	4.8	950,420
2022	705,969	149,300	95,798	951,067	886	4.8	1,000,110
2023	628,613	136,482	161,085	926,180	790	4.7	972,515
2024	701,890	144,422	216,476	1,062,788	790	4.8	1,117,634
2025	705,954	144,499	292,177	1,142,631	790	4.8	1,201,535
2026	712,557	144,797	323,823	1,181,177	790	4.8	1,242,040
2027	716,997	144,698	323,823	1,185,519	790	4.8	1,246,602
2028	722,554	144,984	333,021	1,200,559	790	4.8	1,262,408
2029	722,980	144,522	333,021	1,200,523	790	4.8	1,262,369
2030	726,097	144,190	333,021	1,203,307	790	4.8	1,265,295
2031	729,740	143,907	333,021	1,206,668	790	4.8	1,268,826
2032	735,630	144,084	342,219	1,221,933	790	4.8	1,284,867
2033	736,947	143,546	342,219	1,222,712	790	4.8	1,285,686
2034	740,816	143,474	342,219	1,226,510	790	4.8	1,289,677
2035	745,667	143,500	351,417	1,240,584	790	4.8	1,304,466
2036	753,046	144,038	351,417	1,248,501	790	4.8	1,312,786
2037	756,135	143,962	351,417	1,251,513	790	4.8	1,315,951
2038	761,433	144,350	360,615	1,266,398	790	4.8	1,331,593
2039	767,110	144,734	360,615	1,272,459	790	4.8	1,337,961
2040	775,508	145,257	360,615	1,281,379	790	4.8	1,347,335
2041	779,515	145,039	369,813	1,294,367	790	4.8	1,360,983
2042	786,662	145,277	369,813	1,301,752	790	4.8	1,368,743
2043	794,274	145,646	369,813	1,309,733	790	4.8	1,377,130
2044	804,703	146,498	369,813	1,321,014	790	4.8	1,388,984

Note: 2015 loss partially due to billing change

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	313.9	2014	167.3	2014	970,662	35.3%	-7° F	91° F
2014 - 15	335.2	2015	170.8	2015	923,471	31.4%	-21° F	88° F
2015 - 16	252.2	2016	182.2	2016	933,145	42.2%	3° F	90° F
2016 - 17	239.7	2017	175.0	2017	884,344	42.1%	6° F	89° F
2017 - 18	299.7	2018	181.1	2018	964,216	36.7%	-4° F	91° F
2018 - 19	259.7	2019	175.8	2019	931,455	41%	4° F	91° F
2019 - 20	239.9	2020	182.6	2020	918,803	44%	11° F	89° F
2020 - 21	250.7	2021	184.7	2021	950,420	43%	5° F	89° F
2021 - 22	266.9	2022	188.4	2022	1,000,110	43%	4° F	91° F
2022 - 23	331.1	2023	199.8	2023	972,515	34%	-6° F	91° F
2023 - 24	332.8	2024	215.0	2024	1,117,634	38.3%	-7° F	
2024 - 25	327.2	2025	216.0	2025	1,201,535	41.9%		
2025 - 26	329.0	2026	217.1	2026	1,242,040	43.1%		
2026 - 27	330.2	2027	217.8	2027	1,246,602	43.1%		
2027 - 28	333.4	2028	220.0	2028	1,262,408	43.2%		
2028 - 29	333.1	2029	220.1	2029	1,262,369	43.3%		
2029 - 30	333.8	2030	220.6	2030	1,265,295	43.3%		
2030 - 31	334.6	2031	221.3	2031	1,268,826	43.3%		
2031 - 32	337.8	2032	223.7	2032	1,284,867	43.4%		
2032 - 33	337.7	2033	224.2	2033	1,285,686	43.5%		
2033 - 34	338.7	2034	224.9	2034	1,289,677	43.5%		
2034 - 35	341.4	2035	227.5	2035	1,304,466	43.6%		
2035 - 36	343.7	2036	228.9	2036	1,312,786	43.6%		
2036 - 37	344.1	2037	229.8	2037	1,315,951	43.7%		
2037 - 38	347.0	2038	232.5	2038	1,331,593	43.8%		
2038 - 39	348.5	2039	233.8	2039	1,337,961	43.8%		
2039 - 40	350.9	2040	235.5	2040	1,347,335	43.8%		
2040 - 41	353.1	2041	238.2	2041	1,360,983	44.0%		
2041 - 42	354.9	2042	239.8	2042	1,368,743	44.0%		
2042 - 43	356.9	2043	241.6	2043	1,377,130	44.0%		
2043 - 44	360.1	2044	243.7	2044	1,388,984	44.0%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.1 percent a year for the period 2024-2044, compared to a 1.5 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.5 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 0.6 percent.

- Load factor increases from 41.9% to 44.0% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*
Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Total Sales
5 Year Growth Rates	2018-2023	-2.3%	-0.1%	17.2%	0.2%
	2024-2029	0.6%	0.0%	9.0%	2.5%
10 Year Growth Rates	2013-2023	-1.1%	-0.3%	9.0%	0.2%
	2024-2034	0.5%	-0.1%	4.7%	1.4%
15 Year Growth Rates	2008-2023	-1.1%	-0.9%	6.2%	-0.3%
	2024-2039	0.6%	0.0%	3.5%	1.2%
20 Year Growth Rates	2003-2023	-0.3%	0.0%	3.7%	0.3%
	2024-2044	0.7%	0.1%	2.7%	1.1%

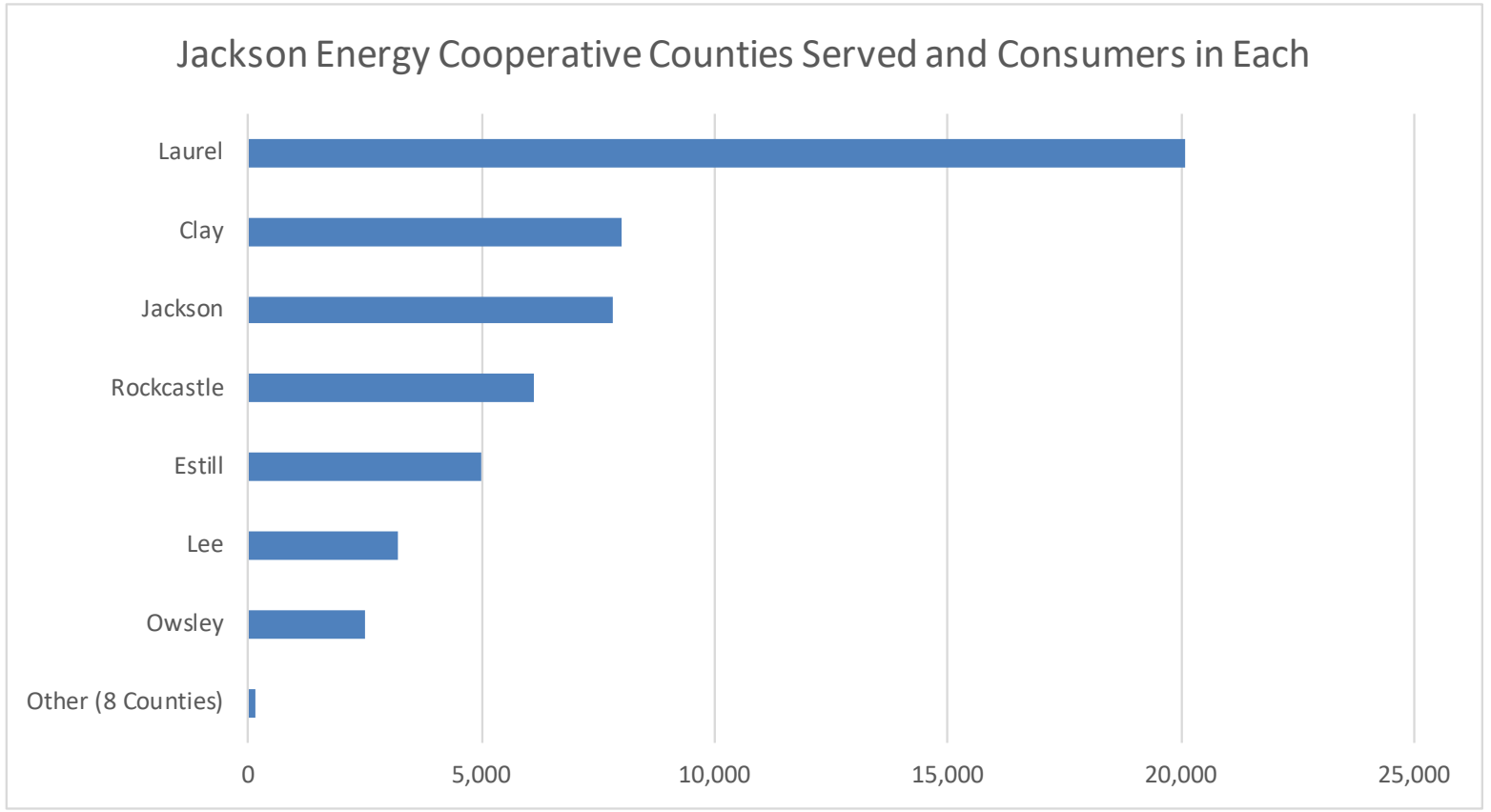
Growth rates shown are Compound Annual Growth Rates.

Narrative

Jackson Energy Cooperative is located in McKee, Kentucky. It serves members in the rural areas of Jackson, Rockcastle, Laurel, Clay, Owsley, Lee, and Estill counties. It also serves small sections of Madison, Pulaski, Wolfe, Powell, Lincoln, Leslie, Breathitt, and Garrard counties. See Figure 1-1. Jackson Energy Cooperative serves the major part of the rural areas, with Kentucky Utilities serving most of the towns and small rural sections along certain roads. Jackson Energy Cooperative's service area boundaries are fixed, and are filed with Kentucky's Public Service Commission. This service area is located in the heart of the Daniel Boone National Forest and also lies partly in Kentucky's eastern coal fields.

Narrative *(continued)*

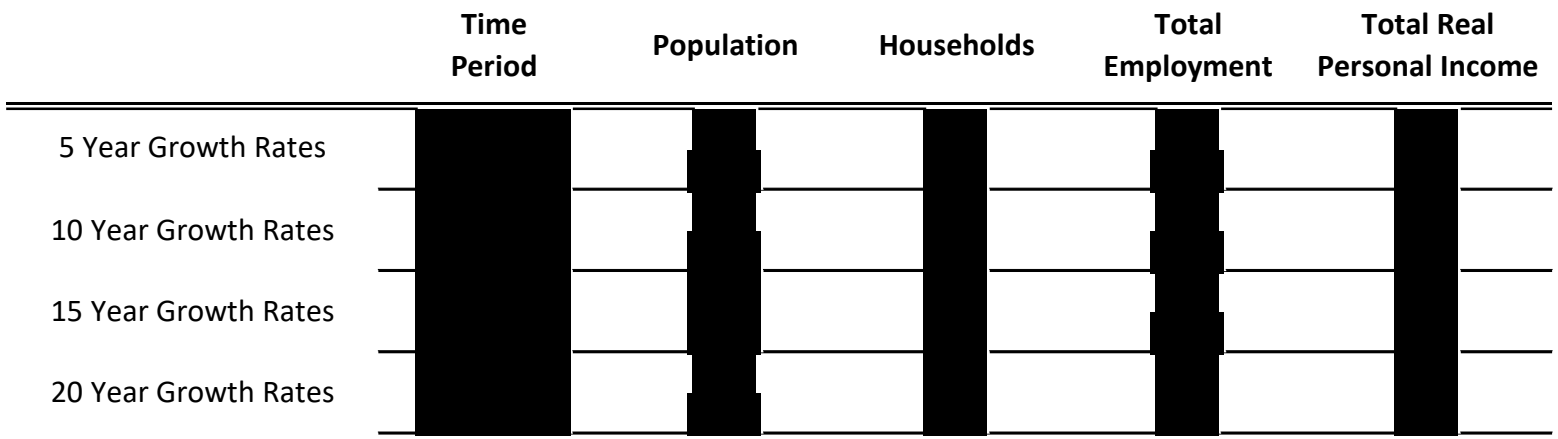
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 70% of consumers use electricity as a primary fuel for heating, while 19% use it as a secondary fuel.
  - 18% use electric furnaces and 46% use electric heat pumps.
- 93% of consumers use electricity for cooling
  - Of those with electric cooling, 85% use central air and 15% use electric window units.
- 93% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the Kentucky Mesonet for Jackson County.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Jackson Energy Cooperative as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Jackson Energy Cooperative experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Jackson Energy Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Peak Demand (MW)	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	970,662,437	1.9%	916,269,717	0.5%	53,298,598	5.5%	309.5	35.8%	51,435	5,685	9.0	$71,077,140	7.3
2015	923,471,224	-4.9%	830,807,078	-9.3%	91,683,778	9.9%	328.8	32.1%	51,359	5,701	9.0	$65,401,388	7.1
2016	933,144,743	1.0%	885,741,298	6.6%	46,307,243	5.0%	245.0	43.4%	51,356	5,714	9.0	$64,053,118	6.9
2017	884,343,501	-5.2%	838,183,236	-5.4%	45,147,582	5.1%	240.8	41.9%	51,391	5,728	9.0	$61,109,367	6.9
2018	964,216,134	9.0%	915,473,832	9.2%	47,695,415	4.9%	297.5	37.0%	51,493	5,742	9.0	$65,445,293	6.8
2019	931,454,608	-3.4%	884,646,143	-3.4%	45,842,260	4.9%	244.2	43.5%	51,584	5,755	9.0	$62,896,567	6.8
2020	918,803,201	-1.4%	872,602,339	-1.4%	45,221,999	4.9%	239.0	43.8%	51,904	5,775	9.0	$58,901,769	6.4
2021	950,419,506	3.4%	903,441,074	3.5%	46,014,634	4.8%	228.2	47.5%	52,385	5,801	9.0	$68,414,633	7.2
2022	1,000,109,716	5.2%	951,067,301	5.3%	48,156,006	4.8%	335.9	34.0%	52,719	5,834	9.0	$87,711,804	8.8
2023	972,514,765	-2.8%	926,179,996	-2.6%	45,544,748	4.7%	236.6	46.9%	52,941	5,852	9.0	$81,726,509	8.4
5 Year Average (2019-2023)						4.8%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Jackson Energy Cooperative staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Jackson Energy Cooperative staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Jackson Energy Cooperative's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Jackson Energy Cooperative's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	47,723	31	0.1	1,238	10	0.8	708,879	5,921	0.8
2015	47,664	-59	-0.1	1,109	-129	-10.4	634,503	-74,376	-10.5
2016	47,690	26	0.1	1,191	82	7.4	681,628	47,124	7.4
2017	47,728	38	0.1	1,115	-76	-6.3	638,874	-42,754	-6.3
2018	47,834	106	0.2	1,229	113	10.2	705,384	66,510	10.4
2019	47,913	79	0.2	1,178	-51	-4.1	677,262	-28,123	-4.0
2020	48,226	313	0.7	1,157	-20	-1.7	669,826	-7,435	-1.1
2021	48,678	452	0.9	1,170	13	1.1	683,725	13,899	2.1
2022	48,954	276	0.6	1,202	31	2.7	705,969	22,244	3.3
2023	49,145	191	0.4	1,066	-136	-11.3	628,613	-77,356	-11.0
2024	49,341	196	0.4	1,185	120	11.2	701,890	73,277	11.7
2025	49,552	211	0.4	1,187	2	0.2	705,954	4,064	0.6
2026	49,773	221	0.4	1,193	6	0.5	712,557	6,603	0.9
2027	49,993	220	0.4	1,195	2	0.2	716,997	4,440	0.6
2028	50,194	201	0.4	1,200	4	0.4	722,554	5,557	0.8
2029	50,379	185	0.4	1,196	-4	-0.3	722,980	426	0.1
2030	50,575	196	0.4	1,196	1	0.0	726,097	3,116	0.4
2031	50,786	211	0.4	1,197	1	0.1	729,740	3,643	0.5
2032	50,988	202	0.4	1,202	5	0.4	735,630	5,891	0.8
2033	51,189	201	0.4	1,200	-3	-0.2	736,947	1,317	0.2
2034	51,389	200	0.4	1,201	2	0.1	740,816	3,869	0.5
2035	51,574	185	0.4	1,205	4	0.3	745,667	4,850	0.7
2036	51,748	174	0.3	1,213	8	0.7	753,046	7,379	1.0
2037	51,920	172	0.3	1,214	1	0.1	756,135	3,089	0.4
2038	52,092	172	0.3	1,218	4	0.4	761,433	5,298	0.7
2039	52,255	163	0.3	1,223	5	0.4	767,110	5,677	0.7
2040	52,421	166	0.3	1,233	9	0.8	775,508	8,398	1.1
2041	52,590	169	0.3	1,235	2	0.2	779,515	4,008	0.5
2042	52,760	170	0.3	1,243	7	0.6	786,662	7,147	0.9
2043	52,925	165	0.3	1,251	8	0.7	794,274	7,612	1.0
2044	53,091	166	0.3	1,263	12	1.0	804,703	10,430	1.3

Note: 2015 loss partially due to billing change

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6
Small Commercial Summary

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	3,706	44	1.2	38	-1	-1.4	140,224	-255	-0.2
2015	3,690	-16	-0.4	36	-2	-4.6	133,175	-7,049	-5.0
2016	3,659	-31	-0.8	36	0	0.4	132,583	-593	-0.4
2017	3,656	-3	-0.1	35	-1	-2.7	128,923	-3,660	-2.8
2018	3,652	-4	-0.1	38	2	6.5	137,137	8,214	6.4
2019	3,664	12	0.3	37	-1	-2.4	134,285	-2,852	-2.1
2020	3,671	7	0.2	35	-1	-3.3	130,053	-4,231	-3.2
2021	3,700	29	0.8	39	3	8.7	142,461	12,408	9.5
2022	3,756	56	1.5	40	1	3.2	149,300	6,839	4.8
2023	3,782	26	0.7	36	-4	-9.2	136,482	-12,818	-8.6
2024	3,816	34	0.9	38	2	4.9	144,422	7,940	5.8
2025	3,841	25	0.7	38	0	-0.6	144,499	77	0.1
2026	3,863	22	0.6	37	0	-0.4	144,797	298	0.2
2027	3,883	20	0.5	37	0	-0.6	144,698	-99	-0.1
2028	3,901	18	0.5	37	0	-0.3	144,984	286	0.2
2029	3,916	15	0.4	37	0	-0.7	144,522	-463	-0.3
2030	3,932	16	0.4	37	0	-0.6	144,190	-332	-0.2
2031	3,948	16	0.4	36	0	-0.6	143,907	-282	-0.2
2032	3,964	16	0.4	36	0	-0.3	144,084	176	0.1
2033	3,980	16	0.4	36	0	-0.8	143,546	-538	-0.4
2034	3,996	16	0.4	36	0	-0.5	143,474	-71	0.0
2035	4,010	14	0.4	36	0	-0.3	143,500	26	0.0
2036	4,024	14	0.3	36	0	0.0	144,038	538	0.4
2037	4,037	13	0.3	36	0	-0.4	143,962	-76	-0.1
2038	4,050	13	0.3	36	0	-0.1	144,350	388	0.3
2039	4,063	13	0.3	36	0	-0.1	144,734	384	0.3
2040	4,076	13	0.3	36	0	0.0	145,257	523	0.4
2041	4,089	13	0.3	35	0	-0.5	145,039	-218	-0.1
2042	4,102	13	0.3	35	0	-0.2	145,277	238	0.2
2043	4,115	13	0.3	35	0	-0.1	145,646	369	0.3
2044	4,128	13	0.3	35	0	0.3	146,498	852	0.6

Note: 2015 loss partially due to billing change

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Jackson Energy Cooperative had 14 consumers in this class and consumers are projected to increase to 20 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	6	0	0.0	11,194	-153	-1.4	67,166	-921	-1.4
2015	5	-1	-16.7	12,626	1,431	12.8	63,128	-4,038	-6.0
2016	7	2	40.0	10,219	-2,407	-19.1	71,531	8,403	13.3
2017	7	0	0.0	10,055	-164	-1.6	70,386	-1,145	-1.6
2018	7	0	0.0	10,422	367	3.6	72,953	2,567	3.6
2019	7	0	0.0	10,443	21	0.2	73,100	147	0.2
2020	7	0	0.0	10,389	-54	-0.5	72,723	-377	-0.5
2021	7	0	0.0	11,036	647	6.2	77,255	4,532	6.2
2022	9	2	28.6	10,644	-392	-3.6	95,798	18,543	24.0
2023	14	5	55.6	11,506	862	8.1	161,085	65,286	68.1
2024	15	1	7.1	14,432	2,926	25.4	216,476	55,392	34.4
2025	15	0	0.0	19,478	5,047	35.0	292,177	75,701	35.0
2026	15	0	0.0	21,588	2,110	10.8	323,823	31,646	10.8
2027	15	0	0.0	21,588	0	0.0	323,823	0	0.0
2028	16	1	6.7	20,814	-774	-3.6	333,021	9,198	2.8
2029	16	0	0.0	20,814	0	0.0	333,021	0	0.0
2030	16	0	0.0	20,814	0	0.0	333,021	0	0.0
2031	16	0	0.0	20,814	0	0.0	333,021	0	0.0
2032	17	1	6.3	20,131	-683	-3.3	342,219	9,198	2.8
2033	17	0	0.0	20,131	0	0.0	342,219	0	0.0
2034	17	0	0.0	20,131	0	0.0	342,219	0	0.0
2035	18	1	5.9	19,523	-607	-3.0	351,417	9,198	2.7
2036	18	0	0.0	19,523	0	0.0	351,417	0	0.0
2037	18	0	0.0	19,523	0	0.0	351,417	0	0.0
2038	19	1	5.6	18,980	-543	-2.8	360,615	9,198	2.6
2039	19	0	0.0	18,980	0	0.0	360,615	0	0.0
2040	19	0	0.0	18,980	0	0.0	360,615	0	0.0
2041	20	1	5.3	18,491	-489	-2.6	369,813	9,198	2.6
2042	20	0	0.0	18,491	0	0.0	369,813	0	0.0
2043	20	0	0.0	18,491	0	0.0	369,813	0	0.0
2044	20	0	0.0	18,491	0	0.0	369,813	0	0.0

Note: 2015 loss partially due to billing change

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Jackson Energy Cooperative's peak demands. Table 1-8 reports the impact of extreme temperature on system demands.

Table 1-8: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal	**Extreme**		
Degrees F	-2	-10	-14	-20
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once in …	2 Years	5 Years	10 Years	30 Years

Winter Non-Coincident Peak (MW)				
Season	Normal	Extreme		
2024 - 25	327	350	361	378
2025 - 26	329	352	363	380
2026 - 27	330	353	364	381
2027 - 28	333	356	367	384
2028 - 29	333	356	367	384
2029 - 30	334	357	368	385
2030 - 31	335	358	369	386
2031 - 32	338	361	372	390
2032 - 33	338	361	372	390
2033 - 34	339	362	374	391
2034 - 35	341	365	376	394
2035 - 36	344	367	379	396
2036 - 37	344	368	379	397
2037 - 38	347	371	382	400
2038 - 39	348	372	384	402
2039 - 40	351	375	387	404
2040 - 41	353	377	389	407
2041 - 42	355	379	391	409
2042 - 43	357	381	393	411
2043 - 44	360	384	396	414

Summer Peak Day Maximum Temperatures				
	Normal	**Extreme**		
Degrees F	94	97	99	101
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once in …	2 Years	5 Years	10 Years	30 Years

Summer Non-Coincident Peak (MW)				
Year	Normal	Extreme		
2024	215	226	233	240
2025	216	227	234	241
2026	217	228	235	242
2027	218	228	236	243
2028	220	231	238	245
2029	220	231	238	245
2030	221	231	239	246
2031	221	232	239	247
2032	224	235	242	249
2033	224	235	243	250
2034	225	236	243	251
2035	227	238	246	253
2036	229	240	247	255
2037	230	241	248	256
2038	232	244	251	259
2039	234	245	253	260
2040	235	247	254	262
2041	238	249	257	265
2042	240	251	259	266
2043	242	253	261	268
2044	244	255	263	270

Salt River Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

SALT RIVER ELECTRIC
A Touchstone Energy Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

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Introduction

Executive Summary

Salt River Electric (Salt River) located in Bardstown, Kentucky, is an electric distribution cooperative that serves members in 10 counties. This load forecast report contains Salt River's long-range forecast of energy and peak demand.

Salt River and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Salt River for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Salt River. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Salt River. Cooperation helps to ensure that the forecast meets both parties' needs. Salt River uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Salt River is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street / Highway Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	737,235	211,633	196,946	2,667	1,148,482	822	4.0	1,196,920
2015	713,266	214,066	200,418	2,727	1,130,478	711	3.9	1,176,520
2016	723,572	215,141	215,466	2,693	1,156,873	523	4.1	1,207,066
2017	699,038	215,343	223,818	2,684	1,140,882	414	3.6	1,184,476
2018	778,672	227,406	234,811	2,677	1,243,565	472	3.9	1,294,364
2019	762,415	223,397	236,780	2,712	1,225,304	436	3.5	1,269,903
2020	743,094	205,180	232,320	2,694	1,183,288	392	4.1	1,234,705
2021	769,188	227,947	243,039	2,818	1,242,992	418	3.2	1,284,500
2022	780,339	253,940	239,151	2,443	1,275,873	408	4.4	1,335,584
2023	724,930	271,133	228,585	2,729	1,227,378	363	3.1	1,266,440
2024	791,736	281,268	212,553	2,777	1,288,334	403	3.7	1,337,711
2025	808,351	287,009	221,058	2,790	1,319,208	403	3.7	1,369,758
2026	825,169	292,913	222,092	2,802	1,342,976	403	3.7	1,394,430
2027	839,086	297,147	231,741	2,813	1,370,787	403	3.7	1,423,298
2028	853,783	301,580	231,938	2,823	1,390,123	403	3.7	1,443,368
2029	861,646	303,637	241,221	2,832	1,409,337	403	3.7	1,463,312
2030	871,898	305,428	241,259	2,841	1,421,427	403	3.7	1,475,861
2031	881,896	307,384	250,473	2,850	1,442,603	403	3.7	1,497,842
2032	894,121	310,195	250,480	2,858	1,457,654	403	3.7	1,513,465
2033	900,754	311,220	250,483	2,866	1,465,322	403	3.7	1,521,425
2034	909,991	312,789	259,683	2,873	1,485,336	403	3.7	1,542,199
2035	920,867	314,343	259,683	2,880	1,497,774	403	3.7	1,555,110
2036	935,620	317,206	268,882	2,888	1,524,595	403	3.7	1,582,950
2037	945,417	318,928	268,882	2,896	1,536,123	403	3.7	1,594,916
2038	958,674	321,985	278,080	2,904	1,561,643	403	3.7	1,621,406
2039	972,769	325,102	278,080	2,912	1,578,863	403	3.7	1,639,280
2040	990,211	328,630	287,278	2,921	1,609,040	403	3.7	1,670,604
2041	1,001,741	330,686	287,278	2,929	1,622,633	403	3.7	1,684,714
2042	1,017,765	334,011	296,476	2,937	1,651,188	403	3.7	1,714,354
2043	1,034,587	337,749	296,476	2,945	1,671,757	403	3.7	1,735,704
2044	1,055,101	342,580	296,476	2,953	1,697,109	403	3.7	1,762,020

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	328.1	2014	245.5	2014	1,196,920	41.6%	4° F	94° F
2014 - 15	333.8	2015	253.2	2015	1,176,520	40.2%	-6° F	94° F
2015 - 16	277.4	2016	258.5	2016	1,207,066	49.5%	7° F	95° F
2016 - 17	277.0	2017	256.9	2017	1,184,476	48.8%	9° F	97° F
2017 - 18	322.5	2018	264.4	2018	1,294,364	45.8%	0° F	98° F
2018 - 19	300.9	2019	279.0	2019	1,269,903	48.2%	3° F	98° F
2019 - 20	265.0	2020	268.8	2020	1,234,705	52.3%	17° F	95° F
2020 - 21	301.1	2021	274.0	2021	1,284,500	48.7%	10° F	94° F
2021 - 22	308.2	2022	286.7	2022	1,335,584	49.5%	8° F	101° F
2022 - 23	388.9	2023	307.2	2023	1,266,440	37.2%	-5° F	99° F
2023 - 24	363.6	2024	306.8	2024	1,337,711	41.9%	3° F	
2024 - 25	362.7	2025	311.8	2025	1,369,758	43.1%		
2025 - 26	368.5	2026	316.3	2026	1,394,430	43.2%		
2026 - 27	374.6	2027	321.2	2027	1,423,298	43.4%		
2027 - 28	379.7	2028	324.6	2028	1,443,368	43.3%		
2028 - 29	383.5	2029	328.2	2029	1,463,312	43.6%		
2029 - 30	386.7	2030	330.6	2030	1,475,861	43.6%		
2030 - 31	391.2	2031	334.6	2031	1,497,842	43.7%		
2031 - 32	395.2	2032	337.3	2032	1,513,465	43.6%		
2032 - 33	396.9	2033	339.3	2033	1,521,425	43.8%		
2033 - 34	401.1	2034	343.1	2034	1,542,199	43.9%		
2034 - 35	404.4	2035	345.9	2035	1,555,110	43.9%		
2035 - 36	410.6	2036	350.9	2036	1,582,950	43.9%		
2036 - 37	413.2	2037	353.9	2037	1,594,916	44.1%		
2037 - 38	418.7	2038	359.0	2038	1,621,406	44.2%		
2038 - 39	423.0	2039	362.8	2039	1,639,280	44.2%		
2039 - 40	429.8	2040	368.6	2040	1,670,604	44.2%		
2040 - 41	432.8	2041	372.1	2041	1,684,714	44.3%		
2041 - 42	439.0	2042	378.0	2042	1,714,354	44.5%		
2042 - 43	444.0	2043	382.6	2043	1,735,704	44.5%		
2043 - 44	450.5	2044	387.8	2044	1,762,020	44.5%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.4 percent a year for the period 2024-2044, compared to a 1.7 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 1.1 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.2 percent.

- Load factor increases from 43.1% to 44.5% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street / Highway Lighting	Total Sales
5-Year	2018-2023	-1.4%	3.6%	-0.5%	0.4%	-0.3%
	2024-2029	1.7%	1.5%	2.6%	0.4%	1.8%
10-Year	2013-2023	0.1%	2.9%	1.8%	0.3%	1.0%
	2024-2034	1.4%	1.1%	2.0%	0.3%	1.4%
15-Year	2008-2023	0.2%	2.3%	3.4%	0.7%	1.1%
	2024-2039	1.4%	1.0%	1.8%	0.3%	1.4%
20-Year	2003-2023	1.1%	3.9%	4.1%	1.2%	2.1%
	2024-2044	1.4%	1.0%	1.7%	0.3%	1.4%

Growth rates shown are Compound Annual Growth Rates.

Narrative

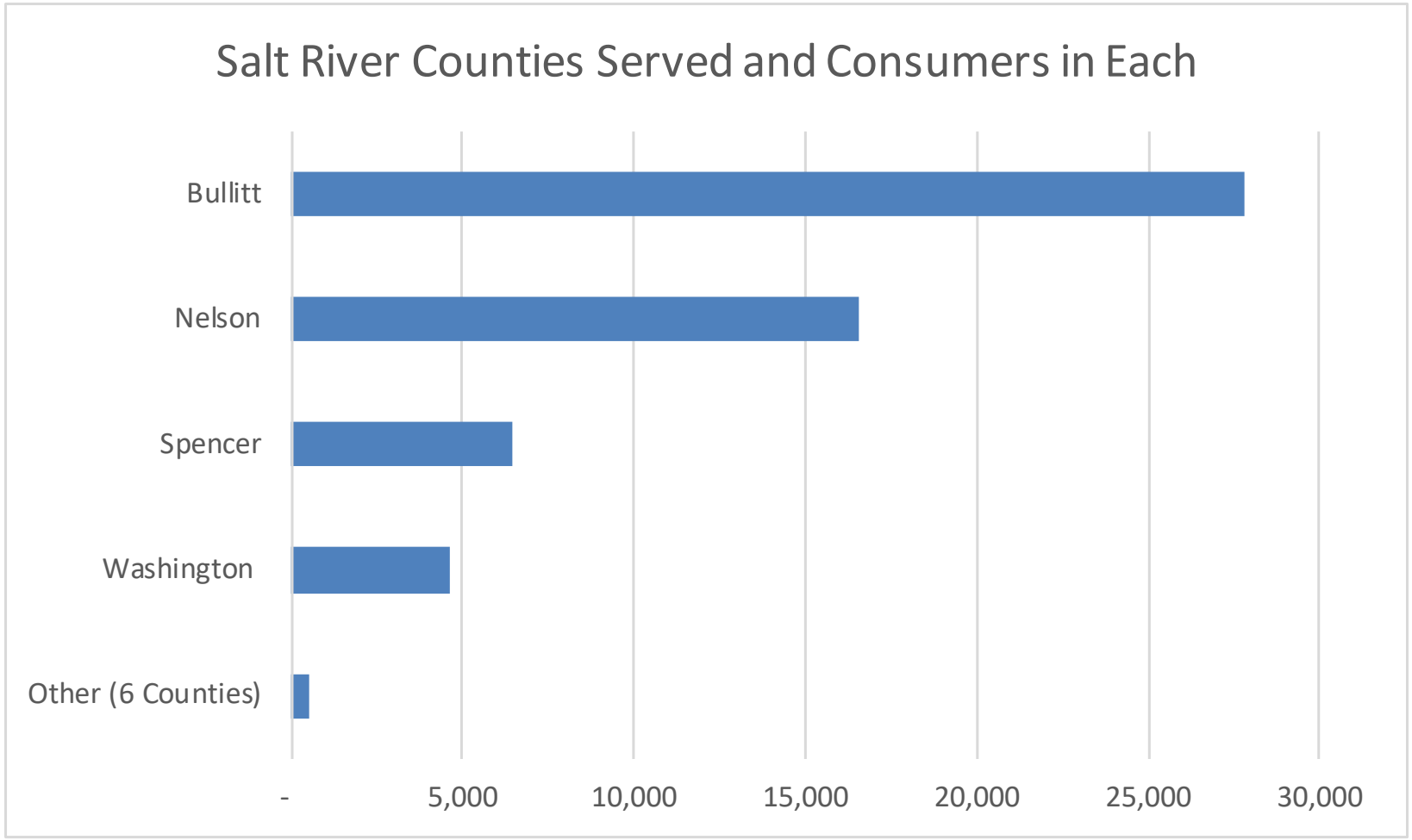
Salt River headquarters is located in Bardstown, Kentucky. The cooperative furnishes electric service to Anderson, Bullitt, Jefferson, LaRue, Marion, Mercer, Nelson, Shelby, Spencer, and Washington counties.

The average household has 2.39 people; 72 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

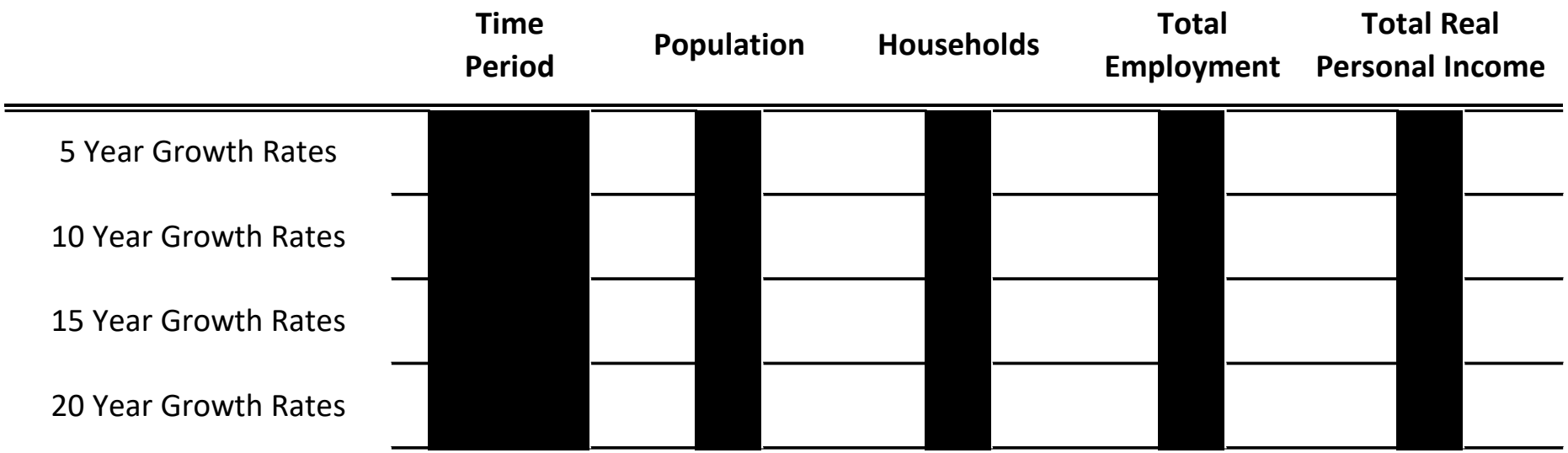
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 57% of consumers use electricity as a primary fuel for heating, while 16% use it as a secondary fuel.
  - 16% use electric furnaces and 38% use electric heat pumps.
- 99% of consumers use electricity for cooling
  - Of those with electric cooling, 94% use central air and 6% use electric window units.
- 77% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the SDF weather station at Louisville Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Salt River as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Salt River experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Salt River Electric Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand (MW)	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	1,196,920,394	3.3%	1,148,481,812	2.9%	47,616,280	4.0%	295.5	46.2%	48,851	4,123	11.8	$86,580,590	7.2
2015	1,176,519,957	-1.7%	1,130,477,773	-1.6%	45,331,020	3.9%	315.3	42.6%	49,401	4,151	11.9	$80,649,188	6.9
2016	1,207,066,266	2.6%	1,156,872,693	2.3%	49,670,835	4.1%	249.3	55.1%	50,051	4,185	12.0	$81,187,942	6.7
2017	1,184,476,084	-1.9%	1,140,881,532	-1.4%	43,180,254	3.6%	264.2	51.2%	50,935	4,232	12.0	$79,252,908	6.7
2018	1,294,364,367	9.3%	1,243,565,081	9.0%	50,327,332	3.9%	309.5	47.7%	51,667	4,273	12.1	$85,851,419	6.6
2019	1,269,902,880	-1.9%	1,225,304,176	-1.5%	44,162,395	3.5%	280.7	51.7%	52,455	4,325	12.1	$83,747,055	6.6
2020	1,234,705,480	-2.8%	1,183,288,347	-3.4%	51,025,610	4.1%	252.3	55.7%	53,443	4,369	12.2	$76,381,613	6.2
2021	1,284,499,605	4.0%	1,242,991,790	5.0%	41,090,188	3.2%	275.1	53.3%	54,465	4,417	12.3	$90,381,980	7.0
2022	1,335,583,693	4.0%	1,275,873,309	2.6%	59,302,352	4.4%	373.5	40.8%	55,227	4,483	12.3	$115,036,024	8.6
2023	1,266,439,714	-5.2%	1,227,378,324	-3.8%	38,698,230	3.1%	270.4	53.5%	56,020	4,478	12.5	$106,185,793	8.4
5 Year Average (2019-2023)						3.7%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Salt River staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Salt River staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Salt River's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Salt River's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	45,790	503	1.1	1,342	21	1.6	737,235	19,334	2.7
2015	46,290	500	1.1	1,284	-58	-4.3	713,266	-23,969	-3.3
2016	46,901	611	1.3	1,286	2	0.1	723,572	10,306	1.4
2017	47,725	824	1.8	1,221	-65	-5.1	699,038	-24,535	-3.4
2018	48,395	670	1.4	1,341	120	9.8	778,672	79,634	11.4
2019	49,113	718	1.5	1,294	-47	-3.5	762,415	-16,257	-2.1
2020	50,040	927	1.9	1,238	-56	-4.3	743,094	-19,321	-2.5
2021	50,992	952	1.9	1,257	20	1.6	769,188	26,094	3.5
2022	51,702	710	1.4	1,258	1	0.1	780,339	11,151	1.4
2023	52,443	741	1.4	1,152	-106	-8.4	724,930	-55,409	-7.1
2024	53,177	734	1.4	1,241	89	7.7	791,736	66,806	9.2
2025	53,895	718	1.4	1,250	9	0.7	808,351	16,615	2.1
2026	54,596	701	1.3	1,260	10	0.8	825,169	16,818	2.1
2027	55,275	679	1.2	1,265	6	0.4	839,086	13,917	1.7
2028	55,900	625	1.1	1,273	8	0.6	853,783	14,697	1.8
2029	56,484	584	1.0	1,271	-2	-0.1	861,646	7,863	0.9
2030	57,032	548	1.0	1,274	3	0.2	871,898	10,253	1.2
2031	57,546	514	0.9	1,277	3	0.2	881,896	9,998	1.1
2032	58,034	488	0.8	1,284	7	0.5	894,121	12,225	1.4
2033	58,527	493	0.8	1,283	-1	-0.1	900,754	6,632	0.7
2034	58,983	456	0.8	1,286	3	0.2	909,991	9,238	1.0
2035	59,428	445	0.8	1,291	6	0.4	920,867	10,876	1.2
2036	59,895	467	0.8	1,302	10	0.8	935,620	14,753	1.6
2037	60,399	504	0.8	1,304	3	0.2	945,417	9,797	1.0
2038	60,913	514	0.9	1,312	7	0.5	958,674	13,257	1.4
2039	61,430	517	0.8	1,320	8	0.6	972,769	14,095	1.5
2040	61,935	505	0.8	1,332	13	1.0	990,211	17,442	1.8
2041	62,440	505	0.8	1,337	5	0.3	1,001,741	11,530	1.2
2042	62,951	511	0.8	1,347	10	0.8	1,017,765	16,024	1.6
2043	63,459	508	0.8	1,359	11	0.8	1,034,587	16,822	1.7
2044	63,958	499	0.8	1,375	16	1.2	1,055,101	20,514	2.0

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	2,833	29	1.0	75	2	2.7	211,633	7,731	3.8
2015	2,875	42	1.5	74	0	-0.3	214,066	2,433	1.1
2016	2,916	41	1.4	74	-1	-0.9	215,141	1,075	0.5
2017	2,972	56	1.9	72	-1	-1.8	215,343	201	0.1
2018	3,028	56	1.9	75	3	3.6	227,406	12,063	5.6
2019	3,089	61	2.0	72	-3	-3.7	223,397	-4,009	-1.8
2020	3,148	59	1.9	65	-7	-9.9	205,180	-18,217	-8.2
2021	3,206	58	1.8	71	6	9.1	227,947	22,767	11.1
2022	3,254	48	1.5	78	7	9.8	253,940	25,994	11.4
2023	3,294	40	1.2	82	4	5.5	271,133	17,193	6.8
2024	3,340	46	1.4	84	2	2.3	281,268	10,134	3.7
2025	3,384	44	1.3	85	1	0.7	287,009	5,741	2.0
2026	3,429	45	1.3	85	1	0.7	292,913	5,904	2.1
2027	3,470	41	1.2	86	0	0.2	297,147	4,234	1.4
2028	3,508	38	1.1	86	0	0.4	301,580	4,432	1.5
2029	3,545	37	1.1	86	0	-0.4	303,637	2,058	0.7
2030	3,579	34	1.0	85	0	-0.4	305,428	1,791	0.6
2031	3,611	32	0.9	85	0	-0.3	307,384	1,956	0.6
2032	3,641	30	0.8	85	0	0.1	310,195	2,810	0.9
2033	3,672	31	0.9	85	0	-0.5	311,220	1,025	0.3
2034	3,700	28	0.8	85	0	-0.3	312,789	1,569	0.5
2035	3,728	28	0.8	84	0	-0.3	314,343	1,554	0.5
2036	3,757	29	0.8	84	0	0.1	317,206	2,862	0.9
2037	3,789	32	0.9	84	0	-0.3	318,928	1,722	0.5
2038	3,821	32	0.8	84	0	0.1	321,985	3,057	1.0
2039	3,853	32	0.8	84	0	0.1	325,102	3,117	1.0
2040	3,885	32	0.8	85	0	0.3	328,630	3,528	1.1
2041	3,916	31	0.8	84	0	-0.2	330,686	2,055	0.6
2042	3,948	32	0.8	85	0	0.2	334,011	3,325	1.0
2043	3,980	32	0.8	85	0	0.3	337,749	3,738	1.1
2044	4,011	31	0.8	85	1	0.6	342,580	4,831	1.4

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Salt River had 22 consumers in this class and consumers are projected to increase to 30 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	16	0	0.0	12,309	333	2.8	196,946	5,324	2.8
2015	17	1	6.3	11,789	-520	-4.2	200,418	3,472	1.8
2016	18	1	5.9	11,970	181	1.5	215,466	15,048	7.5
2017	21	3	16.7	10,658	-1,312	-11.0	223,818	8,352	3.9
2018	22	1	4.8	10,673	15	0.1	234,811	10,993	4.9
2019	22	0	0.0	10,763	90	0.8	236,780	1,969	0.8
2020	22	0	0.0	10,560	-203	-1.9	232,320	-4,460	-1.9
2021	22	0	0.0	11,047	487	4.6	243,039	10,719	4.6
2022	22	0	0.0	10,870	-177	-1.6	239,151	-3,889	-1.6
2023	22	0	0.0	10,390	-480	-4.4	228,585	-10,566	-4.4
2024	22	0	0.0	9,662	-729	-7.0	212,553	-16,032	-7.0
2025	22	0	0.0	10,048	387	4.0	221,058	8,505	4.0
2026	22	0	0.0	10,095	47	0.5	222,092	1,034	0.5
2027	23	1	4.5	10,076	-19	-0.2	231,741	9,649	4.3
2028	23	0	0.0	10,084	9	0.1	231,938	197	0.1
2029	24	1	4.3	10,051	-33	-0.3	241,221	9,284	4.0
2030	24	0	0.0	10,052	2	0.0	241,259	37	0.0
2031	25	1	4.2	10,019	-34	-0.3	250,473	9,214	3.8
2032	25	0	0.0	10,019	0	0.0	250,480	7	0.0
2033	25	0	0.0	10,019	0	0.0	250,483	3	0.0
2034	26	1	4.0	9,988	-32	-0.3	259,683	9,199	3.7
2035	26	0	0.0	9,988	0	0.0	259,683	1	0.0
2036	27	1	3.8	9,959	-29	-0.3	268,882	9,198	3.5
2037	27	0	0.0	9,959	0	0.0	268,882	0	0.0
2038	28	1	3.7	9,931	-27	-0.3	278,080	9,198	3.4
2039	28	0	0.0	9,931	0	0.0	278,080	0	0.0
2040	29	1	3.6	9,906	-25	-0.3	287,278	9,198	3.3
2041	29	0	0.0	9,906	0	0.0	287,278	0	0.0
2042	30	1	3.4	9,883	-24	-0.2	296,476	9,198	3.2
2043	30	0	0.0	9,883	0	0.0	296,476	0	0.0
2044	30	0	0.0	9,883	0	0.0	296,476	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Salt River serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	212	-1	-0.5	13	0	1.1	2,667	18	0.7
2015	219	7	3.3	12	0	-1.0	2,727	59	2.2
2016	216	-3	-1.4	12	0	0.1	2,693	-34	-1.2
2017	217	1	0.5	12	0	-0.8	2,684	-9	-0.3
2018	222	5	2.3	12	0	-2.5	2,677	-7	-0.3
2019	231	9	4.1	12	0	-2.6	2,712	35	1.3
2020	233	2	0.9	12	0	-1.5	2,694	-18	-0.7
2021	245	12	5.2	12	0	-0.5	2,818	124	4.6
2022	249	4	1.6	10	-2	-14.7	2,443	-375	-13.3
2023	261	12	4.8	10	1	6.6	2,729	287	11.7
2024	265	4	1.5	10	0	0.2	2,777	48	1.7
2025	267	2	0.8	10	0	-0.3	2,790	13	0.5
2026	270	3	1.1	10	0	-0.7	2,802	12	0.4
2027	274	4	1.5	10	0	-1.1	2,813	11	0.4
2028	277	3	1.1	10	0	-0.7	2,823	10	0.4
2029	280	3	1.1	10	0	-0.7	2,832	9	0.3
2030	284	4	1.4	10	0	-1.1	2,841	9	0.3
2031	287	3	1.1	10	0	-0.8	2,850	8	0.3
2032	290	3	1.0	10	0	-0.8	2,858	8	0.3
2033	293	3	1.0	10	0	-0.7	2,866	8	0.3
2034	296	3	1.0	10	0	-0.8	2,873	7	0.3
2035	298	2	0.7	10	0	-0.4	2,880	7	0.3
2036	301	3	1.0	10	0	-0.7	2,888	8	0.3
2037	304	3	1.0	10	0	-0.7	2,896	8	0.3
2038	308	4	1.3	9	0	-1.0	2,904	8	0.3
2039	311	3	1.0	9	0	-0.7	2,912	8	0.3
2040	314	3	1.0	9	0	-0.7	2,921	8	0.3
2041	317	3	1.0	9	0	-0.7	2,929	8	0.3
2042	321	4	1.3	9	0	-1.0	2,937	8	0.3
2043	324	3	0.9	9	0	-0.6	2,945	8	0.3
2044	327	3	0.9	9	0	-0.6	2,953	8	0.3

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Salt River's peak demands. Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal	Extreme		
Degrees	5	0	-2	-6
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once in …	2 Years	5 Years	10 Years	30 Years
Non-Coincident Winter Peak Demand - MW				
Season	Normal	Extreme		
2024 - 25	363	375	380	390
2025 - 26	369	381	386	396
2026 - 27	375	387	393	403
2027 - 28	380	393	398	408
2028 - 29	384	397	402	412
2029 - 30	387	400	405	416
2030 - 31	391	405	410	421
2031 - 32	395	409	414	425
2032 - 33	397	410	416	427
2033 - 34	401	415	420	431
2034 - 35	404	418	424	435
2035 - 36	411	425	430	441
2036 - 37	413	427	433	444
2037 - 38	419	433	439	450
2038 - 39	423	437	443	454
2039 - 40	430	444	450	462
2040 - 41	433	447	453	465
2041 - 42	439	454	460	471
2042 - 43	444	459	465	476
2043 - 44	450	465	471	483

Summer Peak Day Maximum Temperatures				
	Normal		Extreme	
Degrees	98	101	103	105
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once in …	2 Years	5 Years	10 Years	30 Years
Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	307	314	320	325
2025	312	319	325	330
2026	316	324	329	335
2027	321	329	334	340
2028	325	333	338	343
2029	328	336	342	347
2030	331	339	344	350
2031	335	343	348	354
2032	337	346	351	357
2033	339	348	353	359
2034	343	352	357	363
2035	346	354	360	366
2036	351	359	365	371
2037	354	362	368	374
2038	359	368	374	379
2039	363	372	378	383
2040	369	377	384	389
2041	372	381	387	393
2042	378	387	393	399
2043	383	392	398	404
2044	388	397	403	409

Taylor County Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

EAST KENTUCKY POWER COOPERATIVE

A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Taylor County Rural Electric Cooperative Corporation (Taylor County RECC), located in Campbellsville, Kentucky, is an electric distribution cooperative that serves members in nine counties. This load forecast report contains Taylor County RECC's long-range forecast of energy and peak demand.

Taylor County RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Taylor County RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Taylor County RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Taylor County RECC. Cooperation helps to ensure that the forecast meets both parties' needs. Taylor County RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Taylor County RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street and Highway Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	315,722	141,382	49,102	721	506,927	374	5.2	535,109
2015	303,138	137,907	44,427	710	486,181	352	5.3	514,003
2016	293,683	134,667	99,652	707	528,709	315	4.7	555,334
2017	283,514	132,035	118,208	708	534,465	308	4.7	560,999
2018	323,042	135,280	124,930	717	583,970	351	4.7	613,327
2019	307,762	131,300	109,888	705	549,654	333	4.8	577,856
2020	297,387	124,681	125,042	660	547,771	291	4.8	575,993
2021	319,836	131,899	131,557	583	583,875	330	4.7	612,802
2022	311,990	130,252	119,376	535	562,153	317	4.6	589,806
2023	290,482	125,636	112,935	472	529,524	325	5.2	558,844
2024	307,705	131,066	123,326	472	562,568	319	4.8	591,470
2025	317,702	131,655	132,524	472	582,352	319	4.8	612,258
2026	327,946	132,313	141,722	472	602,453	319	4.8	633,379
2027	334,482	132,229	141,722	472	608,905	319	4.8	640,160
2028	341,129	132,473	141,722	472	615,796	319	4.8	647,400
2029	345,302	131,868	141,722	472	619,364	319	4.8	651,149
2030	351,141	131,357	141,722	472	624,692	319	4.8	656,748
2031	357,520	130,933	141,722	472	630,646	319	4.8	663,004
2032	365,063	130,969	150,920	472	647,424	319	4.8	680,634
2033	369,443	130,146	150,920	472	650,981	319	4.8	684,371
2034	375,180	129,734	150,920	472	656,306	319	4.8	689,967
2035	381,877	129,503	150,920	472	662,772	319	4.8	696,761
2036	390,303	129,827	150,920	472	671,521	319	4.8	705,955
2037	396,158	129,417	160,118	472	686,165	319	4.8	721,342
2038	401,988	129,428	160,118	472	692,006	319	4.8	727,479
2039	407,472	129,407	160,118	472	697,468	319	4.8	733,220
2040	413,977	129,511	160,118	472	704,078	319	4.8	740,165
2041	417,718	128,821	160,118	472	707,129	319	4.8	743,371
2042	423,325	128,621	160,118	472	712,536	319	4.8	749,052
2043	429,171	128,599	169,316	472	727,557	319	4.8	764,836
2044	436,642	129,084	169,316	472	735,514	319	4.8	773,197

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Non-Coincident Peak Demand	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	156.8	2014	109.8	2014	535,109	39.0%	-1° F	93° F
2014 - 15	164.9	2015	99.7	2015	514,003	35.6%	-12° F	93° F
2015 - 16	139.1	2016	114.2	2016	555,334	45.5%	0° F	92° F
2016 - 17	144.2	2017	115.0	2017	560,999	44.4%	7° F	95° F
2017 - 18	161.7	2018	116.5	2018	613,327	43.3%	-1° F	97° F
2018 - 19	141.9	2019	118.5	2019	577,856	46.5%	11° F	93° F
2019 - 20	133.3	2020	115.1	2020	575,993	49.2%	22° F	95° F
2020 - 21	139.9	2021	116.7	2021	612,802	50.0%	8° F	97° F
2021 - 22	148.9	2022	120.1	2022	589,806	45.2%	3° F	101° F
2022 - 23	180.1	2023	119.4	2023	558,844	35.4%	-3° F	97° F
2023 - 24	176.0	2024	125.2	2024	591,470	38.3%	1° F	
2024 - 25	179.2	2025	130.0	2025	612,258	39.0%		
2025 - 26	185.1	2026	132.0	2026	633,379	39.1%		
2026 - 27	186.7	2027	133.1	2027	640,160	39.1%		
2027 - 28	188.5	2028	134.2	2028	647,400	39.1%		
2028 - 29	189.2	2029	134.8	2029	651,149	39.3%		
2029 - 30	190.3	2030	135.6	2030	656,748	39.4%		
2030 - 31	191.5	2031	136.6	2031	663,004	39.5%		
2031 - 32	194.7	2032	139.2	2032	680,634	39.8%		
2032 - 33	195.2	2033	139.7	2033	684,371	40.0%		
2033 - 34	196.3	2034	140.5	2034	689,967	40.1%		
2034 - 35	197.5	2035	141.4	2035	696,761	40.3%		
2035 - 36	199.4	2036	142.7	2036	705,955	40.3%		
2036 - 37	201.6	2037	145.0	2037	721,342	40.8%		
2037 - 38	202.9	2038	146.0	2038	727,479	40.9%		
2038 - 39	204.1	2039	147.0	2039	733,220	41.0%		
2039 - 40	205.9	2040	148.3	2040	740,165	40.9%		
2040 - 41	206.5	2041	149.0	2041	743,371	41.0%		
2041 - 42	207.8	2042	150.1	2042	749,052	41.0%		
2042 - 43	210.7	2043	152.9	2043	764,836	41.3%		
2043 - 44	212.7	2044	154.4	2044	773,197	41.4%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.3 percent a year for the period 2024-2044, which is consistent with the 1.3 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.9 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.1 percent.

- Load factor increases from 39.0% to 41.4% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street & Highway Lighting	Total Sales
5-Year	2018-2023	-2.1%	-1.5%	-2.0%	-8.0%	-1.9%
	2024-2029	2.3%	0.1%	2.8%	0.0%	1.9%
10-Year	2013-2023	-0.2%	-0.8%	18.9%	-3.8%	1.5%
	2024-2034	2.0%	-0.1%	2.0%	0.0%	1.6%
15-Year	2008-2023	-0.3%	-0.2%	2.0%	-1.8%	0.2%
	2024-2039	1.9%	-0.1%	1.8%	0.0%	1.4%
20-Year	2003-2023	0.1%	0.8%	0.8%	-0.1%	0.4%
	2024-2044	1.8%	-0.1%	1.6%	0.0%	1.3%

Growth rates shown are Compound Annual Growth Rates.

Narrative

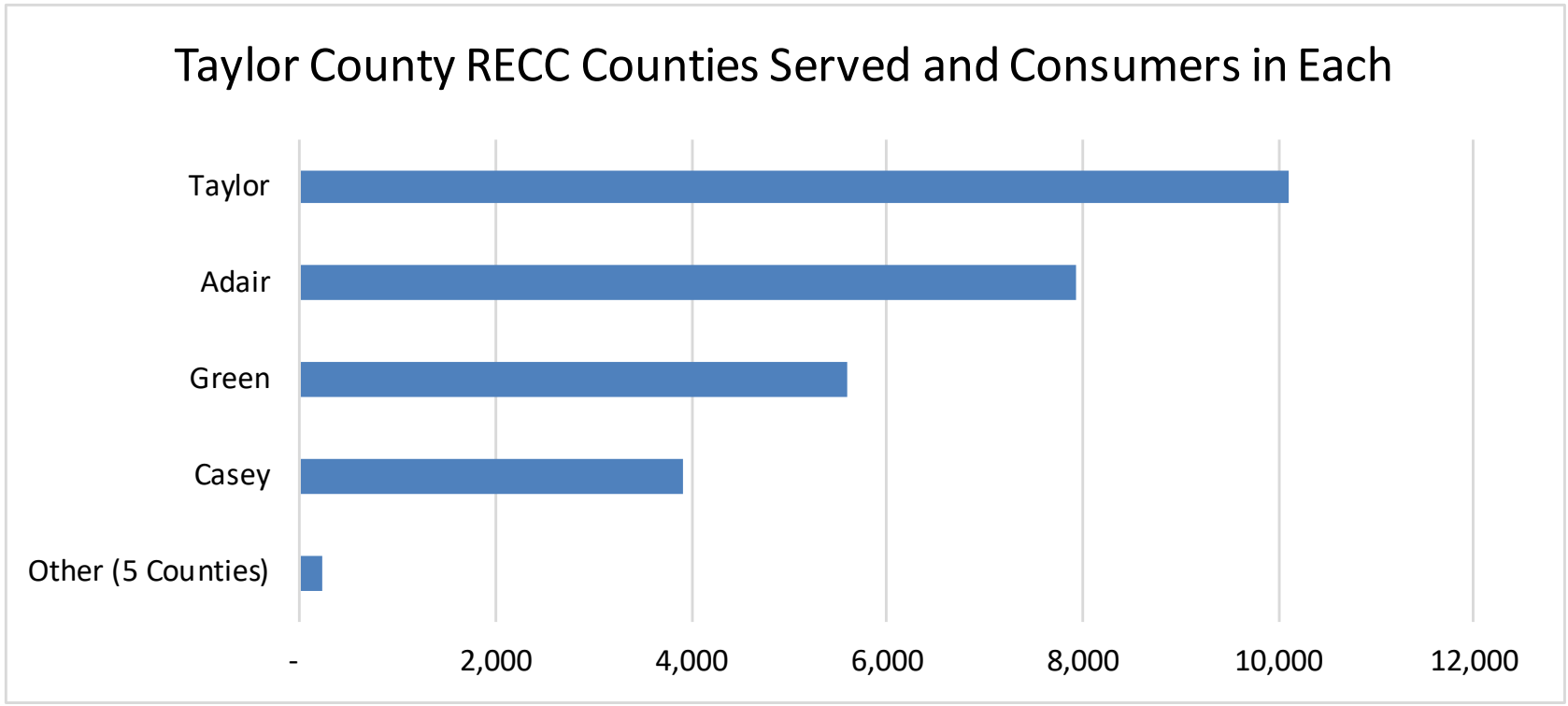
Taylor County RECC headquarters is located in Campbellsville, Kentucky. The cooperative furnishes electric service to Adair, Casey, Cumberland, Green, Hart, Marion, Metcalfe, Russell and Taylor counties. Because Kentucky has certified service boundaries, there is little possibility of a change in service territory. There are no plans for merger, consolidation or reorganization.

The average household has 2.13 people; 76 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

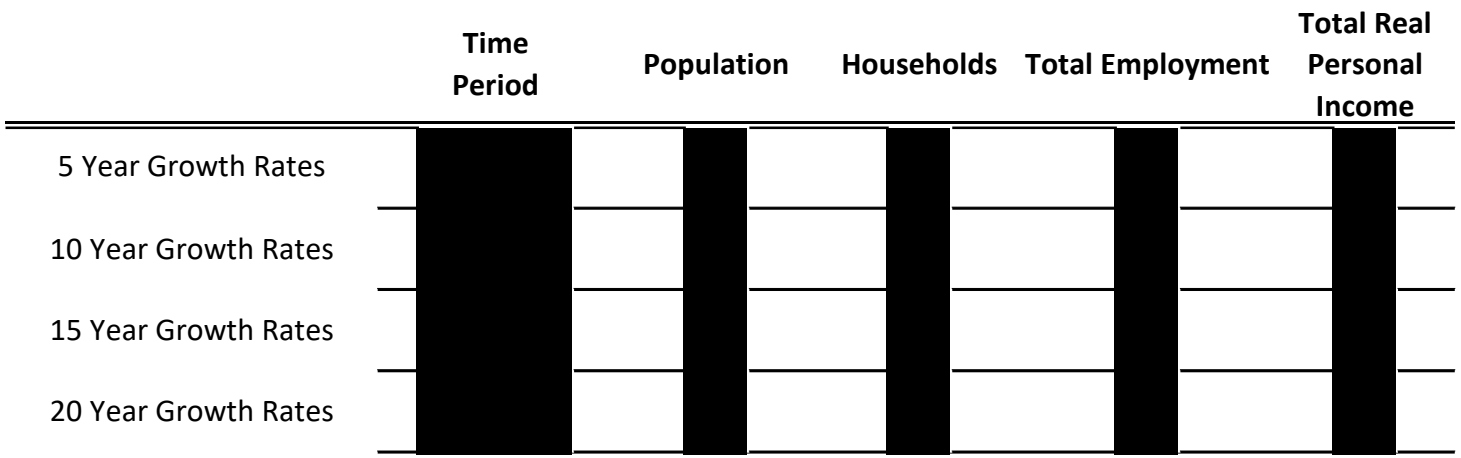
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 66% of consumers use electricity as a primary fuel for heating, while 18% use it as a secondary fuel.
  - 16% use electric furnaces and 41% use electric heat pumps.
- 97% of consumers use electricity for cooling
  - Of those with electric cooling, 85% use central air and 15% use electric window units.
- 82% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the BWG weather station at Bowling Green Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Taylor County RECC as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Taylor County RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4
Taylor County RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	535,108,887	11.1%	506,926,990	11.5%	27,808,103	5.2%	163.0	37.5%	25,958	3,236	8.0	$38,565,673	7.2
2015	514,002,555	-3.9%	486,181,338	-4.1%	27,469,137	5.3%	166.0	35.3%	26,104	3,248	8.0	$35,688,411	6.9
2016	555,333,797	8.0%	528,709,463	8.7%	26,309,485	4.7%	134.8	46.9%	26,290	3,264	8.1	$35,600,434	6.4
2017	560,999,221	1.0%	534,465,256	1.1%	26,225,563	4.7%	141.5	45.3%	26,418	3,273	8.1	$35,345,758	6.3
2018	613,326,993	9.3%	583,969,681	9.3%	29,006,101	4.7%	159.8	43.8%	26,521	3,286	8.1	$38,194,385	6.2
2019	577,856,395	-5.8%	549,654,195	-5.9%	27,869,070	4.8%	137.2	48.1%	26,649	3,299	8.1	$35,984,235	6.2
2020	575,993,383	-0.3%	547,770,660	-0.3%	27,931,341	4.8%	128.1	51.2%	26,883	3,311	8.1	$33,254,997	5.8
2021	612,802,087	6.4%	583,874,807	6.6%	28,597,314	4.7%	128.4	54.5%	27,254	3,334	8.2	$38,800,021	6.3
2022	589,805,880	-3.8%	562,152,646	-3.7%	27,335,861	4.6%	138.9	48.5%	27,557	3,342	8.2	$49,401,903	8.4
2023	558,843,581	-5.2%	529,523,798	-5.8%	28,994,773	5.2%	177.5	35.9%	27,841	3,362	8.3	$45,360,798	8.1

5 Year Average (2019-2023) 4.8%

Methodology and Results *(continued)*

The preliminary forecast was presented to Taylor County RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Taylor County RECC staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Taylor County RECC's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Taylor County RECC's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	22,796	6	0.0	1,154	68	6.2	315,722	18,628	6.3
2015	22,935	139	0.6	1,101	-53	-4.6	303,138	-12,584	-4.0
2016	23,063	128	0.6	1,061	-40	-3.7	293,683	-9,454	-3.1
2017	23,173	110	0.5	1,020	-42	-3.9	283,514	-10,169	-3.5
2018	23,289	116	0.5	1,156	136	13.4	323,042	39,528	13.9
2019	23,423	134	0.6	1,095	-61	-5.3	307,762	-15,281	-4.7
2020	23,647	224	1.0	1,048	-47	-4.3	297,387	-10,375	-3.4
2021	23,966	319	1.3	1,112	64	6.1	319,836	22,449	7.5
2022	24,271	305	1.3	1,071	-41	-3.7	311,990	-7,846	-2.5
2023	24,560	289	1.2	986	-86	-8.0	290,482	-21,508	-6.9
2024	24,809	249	1.0	1,034	48	4.9	307,705	17,223	5.9
2025	25,046	237	1.0	1,057	23	2.3	317,702	9,997	3.2
2026	25,284	238	1.0	1,081	24	2.3	327,946	10,244	3.2
2027	25,527	243	1.0	1,092	11	1.0	334,482	6,536	2.0
2028	25,748	221	0.9	1,104	12	1.1	341,129	6,646	2.0
2029	25,970	222	0.9	1,108	4	0.4	345,302	4,174	1.2
2030	26,196	226	0.9	1,117	9	0.8	351,141	5,839	1.7
2031	26,429	233	0.9	1,127	10	0.9	357,520	6,378	1.8
2032	26,658	229	0.9	1,141	14	1.2	365,063	7,544	2.1
2033	26,873	215	0.8	1,146	4	0.4	369,443	4,380	1.2
2034	27,090	217	0.8	1,154	8	0.7	375,180	5,737	1.6
2035	27,307	217	0.8	1,165	11	1.0	381,877	6,697	1.8
2036	27,528	221	0.8	1,182	16	1.4	390,303	8,426	2.2
2037	27,753	225	0.8	1,190	8	0.7	396,158	5,855	1.5
2038	27,892	139	0.5	1,201	11	1.0	401,988	5,830	1.5
2039	27,982	90	0.3	1,213	12	1.0	407,472	5,484	1.4
2040	28,029	47	0.2	1,231	17	1.4	413,977	6,506	1.6
2041	28,069	40	0.1	1,240	9	0.8	417,718	3,741	0.9
2042	28,104	35	0.1	1,255	15	1.2	423,325	5,607	1.3
2043	28,134	30	0.1	1,271	16	1.3	429,171	5,845	1.4
2044	28,158	24	0.1	1,292	21	1.7	436,642	7,472	1.7

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	3,145	64	2.1	45	0.6	1.3	141,382	4,666	3.4
2015	3,151	6	0.2	44	-1.2	-2.6	137,907	-3,475	-2.5
2016	3,209	58	1.8	42	-1.8	-4.1	134,667	-3,240	-2.3
2017	3,227	18	0.6	41	-1.0	-2.5	132,035	-2,632	-2.0
2018	3,215	-12	-0.4	42	1.2	2.8	135,280	3,245	2.5
2019	3,208	-7	-0.2	41	-1.1	-2.7	131,300	-3,980	-2.9
2020	3,217	9	0.3	39	-2.2	-5.3	124,681	-6,619	-5.0
2021	3,268	51	1.6	40	1.6	4.1	131,899	7,217	5.8
2022	3,266	-2	-0.1	40	-0.5	-1.2	130,252	-1,647	-1.2
2023	3,262	-4	-0.1	39	-1.4	-3.4	125,636	-4,616	-3.5
2024	3,241	-21	-0.6	40	1.9	5.0	131,066	5,430	4.3
2025	3,247	6	0.2	41	0.1	0.3	131,655	589	0.4
2026	3,254	7	0.2	41	0.1	0.3	132,313	658	0.5
2027	3,261	7	0.2	41	-0.1	-0.3	132,229	-83	-0.1
2028	3,267	6	0.2	41	0.0	0.0	132,473	244	0.2
2029	3,274	7	0.2	40	-0.3	-0.7	131,868	-605	-0.5
2030	3,281	7	0.2	40	-0.2	-0.6	131,357	-511	-0.4
2031	3,287	6	0.2	40	-0.2	-0.5	130,933	-424	-0.3
2032	3,294	7	0.2	40	-0.1	-0.2	130,969	36	0.0
2033	3,301	7	0.2	39	-0.3	-0.8	130,146	-823	-0.6
2034	3,307	6	0.2	39	-0.2	-0.5	129,734	-412	-0.3
2035	3,314	7	0.2	39	-0.2	-0.4	129,503	-231	-0.2
2036	3,321	7	0.2	39	0.0	0.0	129,827	324	0.3
2037	3,328	7	0.2	39	-0.2	-0.5	129,417	-410	-0.3
2038	3,334	6	0.2	39	-0.1	-0.2	129,428	11	0.0
2039	3,341	7	0.2	39	-0.1	-0.2	129,407	-21	0.0
2040	3,348	7	0.2	39	0.0	-0.1	129,511	104	0.1
2041	3,354	6	0.2	38	-0.3	-0.7	128,821	-690	-0.5
2042	3,361	7	0.2	38	-0.1	-0.4	128,621	-200	-0.2
2043	3,368	7	0.2	38	-0.1	-0.2	128,599	-22	0.0
2044	3,374	6	0.2	38	0.1	0.2	129,084	486	0.4

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Taylor County RECC had 9 consumers in this class and consumers are projected to increase to 13 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	9	0	0.0	5,456	3,239	146.1	49,102	29,150	146.1
2015	10	1	11.1	4,443	-1,013	-18.6	44,427	-4,675	-9.5
2016	10	0	0.0	9,965	5,523	124.3	99,652	55,226	124.3
2017	10	0	0.0	11,821	1,856	18.6	118,208	18,555	18.6
2018	10	0	0.0	12,493	672	5.7	124,930	6,722	5.7
2019	10	0	0.0	10,989	-1,504	-12.0	109,888	-15,042	-12.0
2020	10	0	0.0	12,504	1,515	13.8	125,042	15,155	13.8
2021	10	0	0.0	13,156	651	5.2	131,557	6,515	5.2
2022	10	0	0.0	11,938	-1,218	-9.3	119,376	-12,181	-9.3
2023	9	-1	-10.0	12,548	611	5.1	112,935	-6,441	-5.4
2024	9	0	0.0	13,703	1,155	9.2	123,326	10,391	9.2
2025	10	1	11.1	13,252	-450	-3.3	132,524	9,198	7.5
2026	10	0	0.0	14,172	920	6.9	141,722	9,198	6.9
2027	10	0	0.0	14,172	0	0.0	141,722	0	0.0
2028	10	0	0.0	14,172	0	0.0	141,722	0	0.0
2029	10	0	0.0	14,172	0	0.0	141,722	0	0.0
2030	10	0	0.0	14,172	0	0.0	141,722	0	0.0
2031	10	0	0.0	14,172	0	0.0	141,722	0	0.0
2032	11	1	10.0	13,720	-452	-3.2	150,920	9,198	6.5
2033	11	0	0.0	13,720	0	0.0	150,920	0	0.0
2034	11	0	0.0	13,720	0	0.0	150,920	0	0.0
2035	11	0	0.0	13,720	0	0.0	150,920	0	0.0
2036	11	0	0.0	13,720	0	0.0	150,920	0	0.0
2037	12	1	9.1	13,343	-377	-2.7	160,118	9,198	6.1
2038	12	0	0.0	13,343	0	0.0	160,118	0	0.0
2039	12	0	0.0	13,343	0	0.0	160,118	0	0.0
2040	12	0	0.0	13,343	0	0.0	160,118	0	0.0
2041	12	0	0.0	13,343	0	0.0	160,118	0	0.0
2042	12	0	0.0	13,343	0	0.0	160,118	0	0.0
2043	13	1	8.3	13,024	-319	-2.4	169,316	9,198	5.7
2044	13	0	0.0	13,024	0	0.0	169,316	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Taylor County RECC serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	8	0	0.0	7,511	246	3.4	721	24	3.4
2015	8	0	0.0	7,394	-117	-1.6	710	-11	-1.6
2016	8	0	0.0	7,364	-30	-0.4	707	-3	-0.4
2017	8	0	0.0	7,377	13	0.2	708	1	0.2
2018	7	-1	-12.5	8,540	1,163	15.8	717	9	1.3
2019	8	1	14.3	7,345	-1,196	-14.0	705	-12	-1.7
2020	9	1	12.5	6,112	-1,233	-16.8	660	-45	-6.4
2021	10	1	11.1	4,861	-1,251	-20.5	583	-77	-11.6
2022	10	0	0.0	4,459	-402	-8.3	535	-48	-8.3
2023	10	0	0.0	3,930	-529	-11.9	472	-63	-11.9
2024	11	1	10.0	3,573	-357	-9.1	472	0	0.0
2025	11	0	0.0	3,573	0	0.0	472	0	0.0
2026	11	0	0.0	3,573	0	0.0	472	0	0.0
2027	11	0	0.0	3,573	0	0.0	472	0	0.0
2028	11	0	0.0	3,573	0	0.0	472	0	0.0
2029	11	0	0.0	3,573	0	0.0	472	0	0.0
2030	11	0	0.0	3,573	0	0.0	472	0	0.0
2031	11	0	0.0	3,573	0	0.0	472	0	0.0
2032	11	0	0.0	3,573	0	0.0	472	0	0.0
2033	11	0	0.0	3,573	0	0.0	472	0	0.0
2034	11	0	0.0	3,573	0	0.0	472	0	0.0
2035	11	0	0.0	3,573	0	0.0	472	0	0.0
2036	11	0	0.0	3,573	0	0.0	472	0	0.0
2037	11	0	0.0	3,573	0	0.0	472	0	0.0
2038	11	0	0.0	3,573	0	0.0	472	0	0.0
2039	11	0	0.0	3,573	0	0.0	472	0	0.0
2040	11	0	0.0	3,573	0	0.0	472	0	0.0
2041	11	0	0.0	3,573	0	0.0	472	0	0.0
2042	11	0	0.0	3,573	0	0.0	472	0	0.0
2043	11	0	0.0	3,573	0	0.0	472	0	0.0
2044	11	0	0.0	3,573	0	0.0	472	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Taylor County RECC's peak demands. Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		**Extreme**	
Degrees	1	-8	-12	-18
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**
Non-Coincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	179	190	195	202
2025 - 26	185	196	201	208
2026 - 27	187	198	203	210
2027 - 28	189	200	204	212
2028 - 29	189	200	205	213
2029 - 30	190	202	207	214
2030 - 31	192	203	208	216
2031 - 32	195	206	211	219
2032 - 33	195	207	212	220
2033 - 34	196	208	213	221
2034 - 35	198	209	214	222
2035 - 36	199	211	216	224
2036 - 37	202	214	219	227
2037 - 38	203	215	220	228
2038 - 39	204	216	221	229
2039 - 40	206	218	223	231
2040 - 41	206	219	224	232
2041 - 42	208	220	225	233
2042 - 43	211	223	228	236
2043 - 44	213	225	230	238

Summer Peak Day Maximum Temperatures				
	Normal		**Extreme**	
Degrees	99	103	105	107
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**
Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	125	133	136	140
2025	130	137	141	145
2026	132	139	143	147
2027	133	141	144	148
2028	134	142	146	149
2029	135	142	146	150
2030	136	143	147	151
2031	137	144	148	152
2032	139	147	151	155
2033	140	148	152	156
2034	140	148	153	157
2035	141	149	154	158
2036	143	151	155	159
2037	145	153	157	161
2038	146	154	158	163
2039	147	155	159	164
2040	148	156	161	165
2041	149	157	162	166
2042	150	158	163	167
2043	153	161	165	170
2044	154	163	167	171

Inter-County Energy Cooperative

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Inter County Energy Cooperative
A Touchstone Energy Cooperative

East Kentucky Power Cooperative
A Touchstone Energy Cooperative

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Introduction

Executive Summary

Inter-County Energy Cooperative (Inter-County Energy), located in Danville, Kentucky, is an electric distribution cooperative that serves members in 12 counties in Kentucky. This load forecast report contains Inter-County Energy's long-range forecast of energy and seasonal peak demand.

Inter-County Energy and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Inter-County Energy for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Inter-County Energy. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Inter-County Energy. Cooperation helps to ensure that the forecast meets both parties' needs. Inter-County Energy uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Inter-County Energy is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	369,316	56,221	46,310	471,847	637	3.1	487,468
2015	341,423	73,989	31,515	446,926	709	4.8	470,443
2016	345,572	68,623	45,707	459,901	727	4.8	484,106
2017	325,775	52,843	61,850	440,469	601	3.9	458,938
2018	375,003	48,392	61,905	485,300	598	4.9	510,842
2019	358,982	47,009	63,671	469,662	573	4.9	494,381
2020	353,854	46,129	56,370	456,353	501	4.6	478,780
2021	369,410	55,668	72,062	497,140	503	3.6	516,124
2022	358,189	58,418	136,587	553,194	553	6.1	589,951
2023	335,990	56,138	151,692	543,819	506	0.1	544,617
2024	356,115	61,979	153,101	571,195	516	3.6	593,132
2025	363,059	64,474	242,663	670,196	516	3.7	696,497
2026	367,716	66,098	302,441	736,256	516	3.7	765,461
2027	370,286	67,401	302,441	740,129	516	3.8	769,505
2028	373,500	68,784	302,441	744,726	516	3.8	774,293
2029	373,339	69,875	302,441	745,656	516	3.8	775,275
2030	374,750	70,907	302,441	748,098	516	3.8	777,824
2031	376,307	71,940	311,639	759,887	516	3.8	790,131
2032	379,164	73,049	311,639	763,853	516	3.8	794,262
2033	378,886	74,014	311,639	764,540	516	3.8	794,989
2034	380,162	75,065	311,639	766,867	516	3.8	797,418
2035	382,215	76,093	311,639	769,947	516	3.8	800,634
2036	385,829	77,194	320,837	783,861	516	3.8	815,149
2037	386,922	78,198	320,837	785,957	516	3.8	817,348
2038	389,385	79,329	320,837	789,552	516	3.8	821,100
2039	392,116	80,433	320,837	793,386	516	3.8	825,104
2040	396,492	81,622	320,837	798,951	516	3.8	830,903
2041	398,032	82,639	330,035	810,707	516	3.8	843,186
2042	401,476	83,739	330,035	815,250	516	3.8	847,929
2043	405,207	84,879	330,035	820,122	516	3.8	853,015
2044	410,556	86,120	330,035	826,711	516	3.8	859,884

Large commercial sales for 2022 and 2023 adjusted due to contract minimum sales

Table 1-1 *(continued)*

Peaks Summary

	Winter		Summer					
Season	Non-Coincident Peak Demand	Year	Non-Coincident Peak Demand	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2011 - 12	114.4	2012	99.4	2012	443,848	44.2%	15° F	103° F
2012 - 13	121.5	2013	89.6	2013	463,897	43.6%	10° F	93° F
2013 - 14	168.4	2014	93.0	2014	487,468	33.0%	0° F	91° F
2014 - 15	176.0	2015	91.5	2015	470,443	30.5%	-18° F	91° F
2015- 16	135.4	2016	96.9	2016	484,106	40.7%	4° F	95° F
2016 - 17	141.0	2017	100.4	2017	458,938	37.2%	4° F	94° F
2017 - 18	167.5	2018	100.4	2018	510,842	34.8%	-3° F	97° F
2018 - 19	142.0	2019	100.5	2019	494,381	39.8%	2° F	97° F
2019 - 20	125.7	2020	98.7	2020	478,780	43.4%	16° F	92° F
2020 - 21	143.3	2021	108.5	2021	516,124	41.1%	2° F	91° F
2021 - 22	163.9	2022	125.4	2022	589,951	41.1%	3° F	98° F
2022 - 23	202.5	2023	116.2	2023	544,617	30.7%	-5° F	94° F
2023 - 24	195.8	2024	124.7	2024	593,132	34.5%	-7° F	
2024 - 25	198.6	2025	151.8	2025	696,497	40.0%		
2025 - 26	221.9	2026	152.4	2026	765,461	39.4%		
2026 - 27	222.1	2027	152.5	2027	769,505	39.5%		
2027 - 28	222.8	2028	152.8	2028	774,293	39.6%		
2028 - 29	222.1	2029	152.7	2029	775,275	39.8%		
2029 - 30	222.1	2030	152.8	2030	777,824	40.0%		
2030 - 31	223.6	2031	154.4	2031	790,131	40.3%		
2031 - 32	224.1	2032	154.7	2032	794,262	40.3%		
2032 - 33	223.6	2033	154.7	2033	794,989	40.6%		
2033 - 34	223.6	2034	154.9	2034	797,418	40.7%		
2034 - 35	223.7	2035	155.2	2035	800,634	40.8%		
2035 - 36	226.1	2036	157.1	2036	815,149	41.1%		
2036 - 37	225.8	2037	157.4	2037	817,348	41.3%		
2037 - 38	226.1	2038	157.9	2038	821,100	41.5%		
2038 - 39	226.5	2039	158.3	2039	825,104	41.6%		
2039 - 40	227.4	2040	158.9	2040	830,903	41.6%		
2040 - 41	228.7	2041	160.7	2041	843,186	42.1%		
2041 - 42	229.1	2042	161.3	2042	847,929	42.2%		
2042 - 43	229.7	2043	161.9	2043	853,015	42.4%		
2043 - 44	230.8	2044	162.6	2044	859,884	42.5%		

Large commercial sales for 2022 and 2023 adjusted due to contract minimum sales

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.9 percent a year for the period 2024-2044, compared to a 1.5 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.8 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.3 percent.

- Load factor increases from 40.0% to 42.5% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Total Sales
5 Year Growth Rates	2018-2023	-2.2%	3.0%	19.6%	2.3%
	2024-2029	0.9%	2.4%	14.6%	5.5%
10 Year Growth Rates	2013-2023	-0.1%	-0.7%	16.0%	2.3%
	2024-2034	0.7%	1.9%	7.4%	3.0%
15 Year Growth Rates	2008-2023	-0.1%	-1.9%	15.5%	1.5%
	2024-2039	0.6%	1.8%	5.1%	2.2%
20 Year Growth Rates	2003-2023	-0.1%	1.2%	11.6%	1.5%
	2024-2044	0.7%	1.7%	3.9%	1.9%

Growth rates shown are Compound Annual Growth Rates.

Narrative

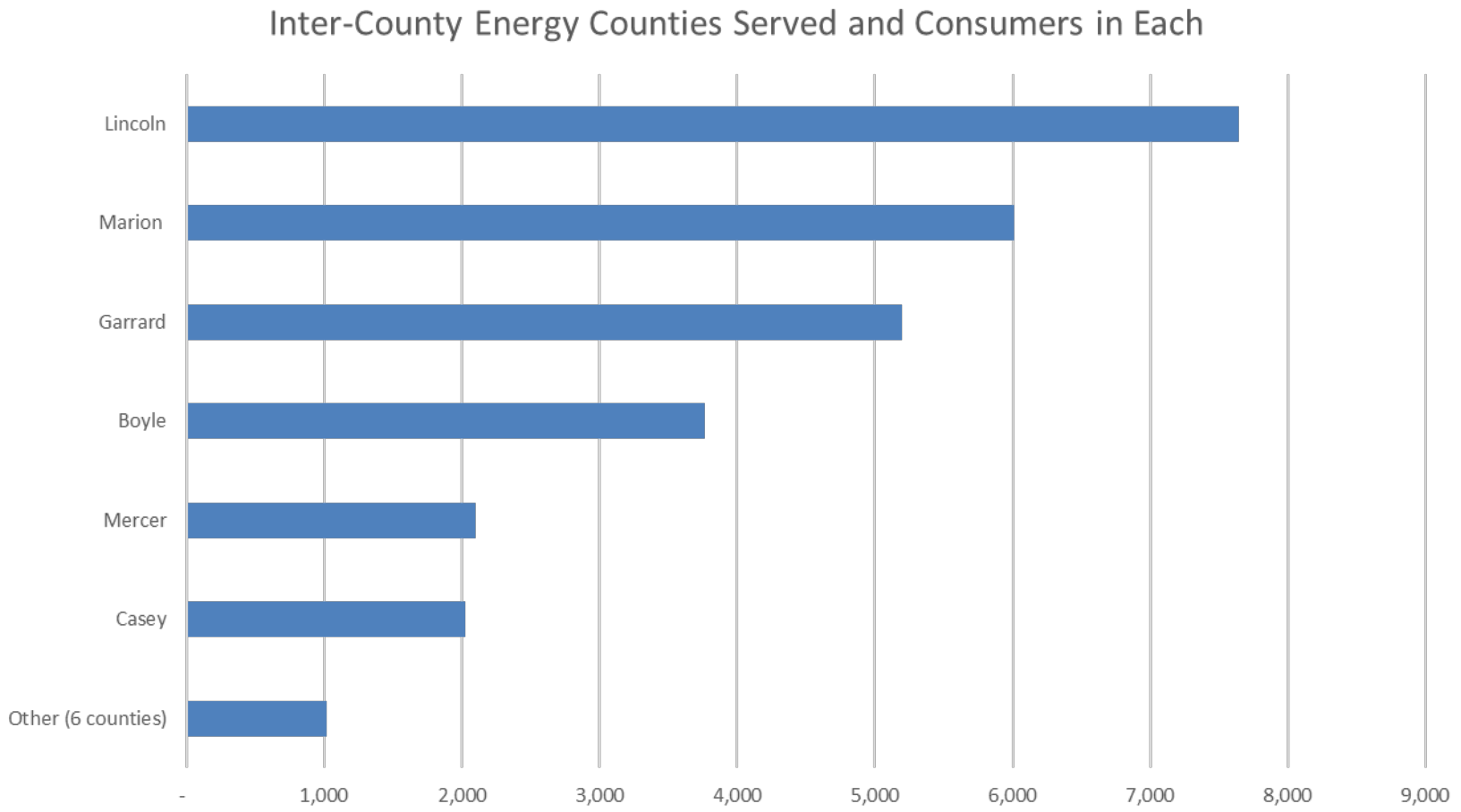
Inter-County Energy is a Touchstone Energy Cooperative with its headquarters in Danville, Kentucky and a district office in Lebanon, Kentucky. With approximately 4,000 miles of distribution lines, the cooperative serves more than 27,000 consumers in the rural areas of the following central Kentucky counties: Boyle, Casey, Garrard, LaRue, Lincoln, Madison, Marion, Mercer, Nelson, Rockcastle, Taylor, and Washington.

Kentucky Utilities Company, an investor owned utility, provides electric service to most of the urban and small towns in the area.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.
Line mileage from 2024 Kentucky Electric Cooperatives Directory.

Narrative *(continued)*

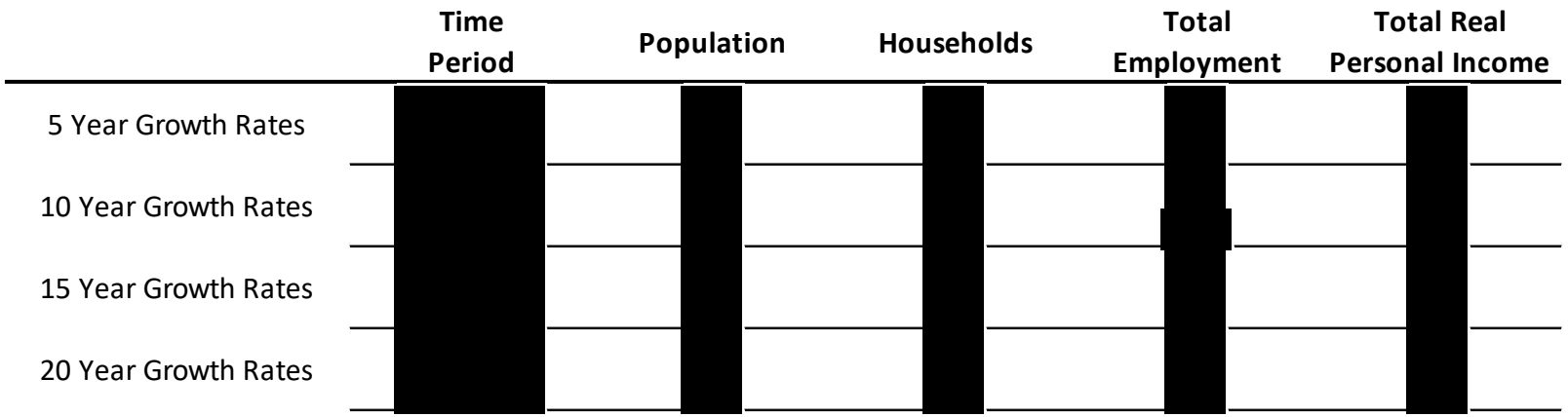
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 68% of consumers use electricity as a primary fuel for heating, while 17% use it as a secondary fuel.
  - 24% use electric furnaces and 51% use electric heat pumps.
- 94% of consumers use electricity for cooling
  - Of those with electric cooling, 84% use central air and 16% use electric window units.
- 89% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the LEX weather station at Blue Grass Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Inter-County Energy as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Inter-County Energy experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4 Inter-County Energy Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	487,468,438	5.1%	471,846,532	9.0%	14,984,867	3.1%	158.4	35.1%	25,568	3,834	6.7	$36,394,601	7.5
2015	470,443,362	-3.5%	446,926,324	-5.3%	22,807,818	4.8%	172.0	31.2%	25,686	3,875	6.6	$33,200,218	7.1
2016	484,106,405	2.9%	459,901,085	2.9%	23,478,328	4.8%	127.0	43.4%	25,908	3,935	6.6	$33,246,100	6.9
2017	458,938,301	-5.2%	440,468,512	-4.2%	17,868,401	3.9%	139.3	37.6%	26,141	3,978	6.6	$32,070,679	7.0
2018	510,842,152	11.3%	485,300,045	10.2%	24,944,467	4.9%	161.6	36.1%	26,307	4,016	6.6	$34,718,745	6.8
2019	494,380,809	-3.2%	469,661,768	-3.2%	24,146,185	4.9%	135.4	41.7%	26,449	3,928	6.7	$33,461,944	6.8
2020	478,780,419	-3.2%	456,352,982	-2.8%	21,926,644	4.6%	129.8	42.0%	26,769	3,945	6.8	$30,633,154	6.4
2021	516,124,376	7.8%	497,140,493	8.9%	18,480,580	3.6%	140.5	41.9%	27,150	3,965	6.8	$37,147,931	7.2
2022	633,064,936	22.7%	596,308,531	19.9%	36,203,824	5.7%	219.0	33.0%	27,520	3,989	6.9	$51,585,310	8.1
2023	613,907,932	-3.0%	613,110,742	2.8%	291,478	0.0%	147.9	47.4%	27,747	4,026	6.9	$48,049,410	7.8

5 Year Average (2019-2023) 3.8%

2022 and 2023 kWh purchases and sales are actual including contract minimum sales.

Methodology and Results *(continued)*

The preliminary forecast was presented to Inter-County Energy staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Inter-County Energy staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Inter-County Energy's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Inter-County Energy's energy forecast.

Table 1-5
Residential Summary

	Consumers				Use Per Consumer			Class Sales		
	Annual Average	Annual Change	w/o Reclass	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	24,094	183		0.8	1,277	99	8.4	369,316	31,068	9.2
2015	24,170	76		0.3	1,177	-100	-7.8	341,423	-27,893	-7.6
2016	24,369	199		0.8	1,182	5	0.4	345,572	4,149	1.2
2017	24,581	212		0.9	1,104	-77	-6.5	325,775	-19,796	-5.7
2018	25,329	748	203	3.0	1,234	129	11.7	375,003	49,227	15.1
2019	25,397	68		0.3	1,178	-56	-4.5	358,982	-16,021	-4.3
2020	25,650	253		1.0	1,150	-28	-2.4	353,854	-5,127	-1.4
2021	25,967	317		1.2	1,186	36	3.1	369,410	15,556	4.4
2022	26,257	290		1.1	1,137	-49	-4.1	358,189	-11,221	-3.0
2023	26,408	151		0.6	1,060	-77	-6.7	335,990	-22,199	-6.2
2024	26,521	113		0.4	1,119	59	5.5	356,115	20,125	6.0
2025	26,628	107		0.4	1,136	17	1.5	363,059	6,944	1.9
2026	26,725	97		0.4	1,147	10	0.9	367,716	4,657	1.3
2027	26,810	85		0.3	1,151	4	0.4	370,286	2,570	0.7
2028	26,879	69		0.3	1,158	7	0.6	373,500	3,214	0.9
2029	26,936	57		0.2	1,155	-3	-0.3	373,339	-160	0.0
2030	26,990	54		0.2	1,157	2	0.2	374,750	1,411	0.4
2031	27,042	52		0.2	1,160	3	0.2	376,307	1,557	0.4
2032	27,084	42		0.2	1,167	7	0.6	379,164	2,857	0.8
2033	27,123	39		0.1	1,164	-3	-0.2	378,886	-278	-0.1
2034	27,157	34		0.1	1,167	2	0.2	380,162	1,276	0.3
2035	27,186	29		0.1	1,172	5	0.4	382,215	2,052	0.5
2036	27,215	29		0.1	1,181	10	0.8	385,829	3,615	0.9
2037	27,247	32		0.1	1,183	2	0.2	386,922	1,092	0.3
2038	27,278	31		0.1	1,190	6	0.5	389,385	2,463	0.6
2039	27,305	27		0.1	1,197	7	0.6	392,116	2,731	0.7
2040	27,330	25		0.1	1,209	12	1.0	396,492	4,376	1.1
2041	27,351	21		0.1	1,213	4	0.3	398,032	1,540	0.4
2042	27,369	18		0.1	1,222	10	0.8	401,476	3,444	0.9
2043	27,382	13		0.0	1,233	11	0.9	405,207	3,731	0.9
2044	27,391	9		0.0	1,249	16	1.3	410,556	5,348	1.3

Note: Reclassification beginning 2018

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers				Use Per Consumer			Class Sales		
	Annual Average	Annual Change	w/o Reclass	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,467	53		3.7	38	-4	-9.8	56,221	-3,840	-6.4
2015	1,513	46		3.1	49	11	27.6	73,989	17,768	31.6
2016	1,535	22		1.5	45	-4	-8.6	68,623	-5,366	-7.3
2017	1,552	17		1.1	34	-11	-23.8	52,843	-15,780	-23.0
2018	970	-582	20	-37.5	50	16	46.5	48,392	-4,451	-8.4
2019	1,043	73		7.5	45	-5	-9.7	47,009	-1,383	-2.9
2020	1,109	66		6.3	42	-3	-7.7	46,129	-880	-1.9
2021	1,173	64		5.8	47	6	14.1	55,668	9,539	20.7
2022	1,253	80		6.8	47	-1	-1.8	58,418	2,750	4.9
2023	1,329	76		6.1	42	-4	-9.4	56,138	-2,280	-3.9
2024	1,378	49		3.7	45	2.7	6.5	61,979	5,841	10.4
2025	1,420	42		3.0	45	0.4	0.9	64,474	2,495	4.0
2026	1,452	32		2.3	46	0.1	0.3	66,098	1,624	2.5
2027	1,480	28		1.9	46	0.0	0.0	67,401	1,303	2.0
2028	1,509	29		2.0	46	0.0	0.1	68,784	1,383	2.1
2029	1,535	26		1.7	46	-0.1	-0.1	69,875	1,091	1.6
2030	1,559	24		1.6	45	0.0	-0.1	70,907	1,031	1.5
2031	1,583	24		1.5	45	0.0	-0.1	71,940	1,033	1.5
2032	1,607	24		1.5	45	0.0	0.0	73,049	1,109	1.5
2033	1,631	24		1.5	45	-0.1	-0.2	74,014	965	1.3
2034	1,655	24		1.5	45	0.0	-0.1	75,065	1,051	1.4
2035	1,678	23		1.4	45	0.0	0.0	76,093	1,028	1.4
2036	1,701	23		1.4	45	0.0	0.1	77,194	1,101	1.4
2037	1,724	23		1.4	45	0.0	-0.1	78,198	1,004	1.3
2038	1,748	24		1.4	45	0.0	0.1	79,329	1,131	1.4
2039	1,772	24		1.4	45	0.0	0.0	80,433	1,103	1.4
2040	1,797	25		1.4	45	0.0	0.1	81,622	1,189	1.5
2041	1,820	23		1.3	45	0.0	0.0	82,639	1,018	1.2
2042	1,844	24		1.3	45	0.0	0.0	83,739	1,099	1.3
2043	1,868	24		1.3	45	0.0	0.1	84,879	1,141	1.4
2044	1,892	24		1.3	46	0.1	0.2	86,120	1,241	1.5

Note: Recalssification beginning 2018

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Inter-County Energy had 10 consumers in this class and consumers are projected to increase to 16 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	3	0	0.0	15,437	3,927	34.1	46,310	11,780	34.1
2015	3	0	0.0	10,505	-4,932	-31.9	31,515	-14,795	-31.9
2016	4	1	33.3	11,427	922	8.8	45,707	14,192	45.0
2017	8	4	100.0	7,731	-3,695	-32.3	61,850	16,143	35.3
2018	8	0	0.0	7,738	7	0.1	61,905	55	0.1
2019	9	1	12.5	7,075	-664	-8.6	63,671	1,766	2.9
2020	10	1	11.1	5,637	-1,438	-20.3	56,370	-7,302	-11.5
2021	10	0	0.0	7,206	1,569	27.8	72,062	15,693	27.8
2022	10	0	0.0	13,659	6,452	89.5	136,587	64,524	89.5
2023	10	0	0.0	15,169	1,511	11.1	151,692	15,105	11.1
2024	10	0	0.0	15,310	141	0.9	153,101	1,409	0.9
2025	13	3	30.0	18,666	3,356	21.9	242,663	89,562	58.5
2026	13	0	0.0	23,265	4,598	24.6	302,441	59,778	24.6
2027	13	0	0.0	23,265	0	0.0	302,441	0	0.0
2028	13	0	0.0	23,265	0	0.0	302,441	0	0.0
2029	13	0	0.0	23,265	0	0.0	302,441	0	0.0
2030	13	0	0.0	23,265	0	0.0	302,441	0	0.0
2031	14	1	7.7	22,260	-1,005	-4.3	311,639	9,198	3.0
2032	14	0	0.0	22,260	0	0.0	311,639	0	0.0
2033	14	0	0.0	22,260	0	0.0	311,639	0	0.0
2034	14	0	0.0	22,260	0	0.0	311,639	0	0.0
2035	14	0	0.0	22,260	0	0.0	311,639	0	0.0
2036	15	1	7.1	21,389	-871	-3.9	320,837	9,198	3.0
2037	15	0	0.0	21,389	0	0.0	320,837	0	0.0
2038	15	0	0.0	21,389	0	0.0	320,837	0	0.0
2039	15	0	0.0	21,389	0	0.0	320,837	0	0.0
2040	15	0	0.0	21,389	0	0.0	320,837	0	0.0
2041	16	1	6.7	20,627	-762	-3.6	330,035	9,198	2.9
2042	16	0	0.0	20,627	0	0.0	330,035	0	0.0
2043	16	0	0.0	20,627	0	0.0	330,035	0	0.0
2044	16	0	0.0	20,627	0	0.0	330,035	0	0.0

Large commercial sales for 2022 and 2023 adjusted due to contract minimum sales

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Inter-County Energy's peak demands. Table 1-8 reports the impact of extreme temperature on system demands.

Table 1-8: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		**Extreme**	
Degrees	-2	-10	-14	-17
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Summer Peak Day Maximum Temperatures				
	Normal		**Extreme**	
Degrees	96	99	101	103
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	199	215	224	230
2025 - 26	222	239	247	253
2026 - 27	222	239	247	254
2027 - 28	223	240	248	254
2028 - 29	222	239	247	254
2029 - 30	222	239	247	254
2030 - 31	224	241	249	255
2031 - 32	224	241	250	256
2032 - 33	224	241	249	255
2033 - 34	224	241	249	255
2034 - 35	224	241	249	256
2035 - 36	226	243	252	258
2036 - 37	226	243	251	258
2037 - 38	226	243	252	258
2038 - 39	226	244	252	259
2039 - 40	227	245	253	260
2040 - 41	229	246	254	261
2041 - 42	229	246	255	261
2042 - 43	230	247	255	262
2043 - 44	231	248	257	263

Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	125	130	133	137
2025	152	157	160	164
2026	152	158	161	164
2027	153	158	161	165
2028	153	158	161	165
2029	153	158	161	165
2030	153	158	162	165
2031	154	160	163	167
2032	155	160	163	167
2033	155	160	164	167
2034	155	160	164	167
2035	155	160	164	168
2036	157	162	166	169
2037	157	163	166	170
2038	158	163	167	170
2039	158	164	167	171
2040	159	164	168	171
2041	161	166	170	173
2042	161	167	170	174
2043	162	167	171	174
2044	163	168	172	175

Shelby Energy Cooperative, Inc.

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Shelby Energy Cooperative
A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Shelby Energy Cooperative, Inc., (Shelby Energy), located in Shelbyville, Kentucky, is an electric distribution cooperative that serves members in ten counties. This load forecast report contains Shelby Energy's long-range forecast of energy and seasonal peak demand.

Shelby Energy and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Shelby Energy for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Shelby Energy. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Shelby Energy. Cooperation helps to ensure that the forecast meets both parties' needs. Shelby Energy uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Shelby Energy is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Seasonal Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street / Highway Lighting Sales (MWh)	Total Sales (MWh)	% Loss	Purchased Power (MWh)
2014	241,615	370	81,069	159,527	192	482,774	3.5	500,440
2015	229,816	354	85,496	164,344	193	480,203	3.6	498,300
2016	232,772	416	90,937	174,816	186	499,126	3.3	516,352
2017	224,148	534	88,841	171,067	170	484,761	3.2	500,696
2018	247,767	621	89,086	166,965	159	504,599	3.9	524,856
2019	242,995	663	89,400	164,702	145	497,905	3.5	516,055
2020	241,278	662	82,080	149,931	146	474,097	2.8	487,870
2021	245,955	489	92,272	129,652	138	468,506	2.9	482,574
2022	252,206	753	92,056	138,592	135	483,741	2.7	497,086
2023	230,622	1,069	87,781	136,627	136	456,235	4.1	475,570
2024	257,662	1,072	89,493	155,557	139	503,922	3.0	519,398
2025	262,256	1,088	90,482	288,321	139	642,286	2.4	657,934
2026	266,559	1,090	91,379	473,492	139	832,659	1.9	848,474
2027	269,642	1,088	91,847	581,897	139	944,614	1.7	960,542
2028	272,779	1,088	92,404	581,897	139	948,307	1.7	964,354
2029	273,488	1,084	92,295	581,897	139	948,903	1.7	964,968
2030	275,142	1,082	92,136	591,095	139	959,594	1.7	976,002
2031	276,795	1,080	92,056	591,095	139	961,166	1.7	977,624
2032	279,167	1,080	92,246	591,095	139	963,727	1.7	980,267
2033	279,766	1,077	91,974	591,095	139	964,052	1.7	980,602
2034	281,100	1,076	91,885	591,095	139	965,295	1.7	981,886
2035	282,757	1,077	91,804	600,293	139	976,070	1.7	993,006
2036	285,455	1,079	92,013	600,293	139	978,979	1.7	996,007
2037	286,624	1,078	91,871	600,293	139	980,005	1.7	997,066
2038	288,776	1,079	92,074	600,293	139	982,361	1.7	999,497
2039	291,159	1,081	92,273	609,491	139	994,144	1.7	1,011,657
2040	294,520	1,084	92,580	609,491	139	997,815	1.7	1,015,446
2041	296,109	1,085	92,498	609,491	139	999,321	1.7	1,017,000
2042	298,894	1,087	92,730	609,491	139	1,002,341	1.7	1,020,118
2043	301,796	1,090	93,058	609,491	139	1,005,573	1.7	1,023,453
2044	305,720	1,094	93,665	618,689	139	1,019,308	1.8	1,037,627

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*					
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	127.8	2014	94.8	2014	500,440	44.7%	4° F	94° F
2014 - 15	126.2	2015	95.6	2015	498,300	45.1%	-6° F	94° F
2015 - 16	110.2	2016	98.6	2016	516,353	53.4%	7° F	95° F
2016 - 17	110.2	2017	96.4	2017	500,696	51.9%	9° F	97° F
2017 - 18	125.3	2018	97.2	2018	524,856	47.8%	0° F	98° F
2018 - 19	119.9	2019	96.9	2019	516,055	49.1%	3° F	98° F
2019 - 20	106.0	2020	95.6	2020	487,870	52.4%	16° F	95° F
2020 - 21	109.2	2021	98.8	2021	482,574	50.4%	10° F	97° F
2021 - 22	113.0	2022	98.2	2022	497,086	50.2%	8° F	101° F
2022 - 23	139.7	2023	97.0	2023	475,570	38.9%	-5° F	99° F
2023 - 24	128.4	2024	96.2	2024	519,398	46.1%	3° F	
2024 - 25	149.0	2025	124.6	2025	657,934	50.4%		
2025 - 26	194.1	2026	159.2	2026	848,474	49.9%		
2026 - 27	224.7	2027	189.7	2027	960,542	48.8%		
2027 - 28	225.5	2028	190.1	2028	964,354	48.7%		
2028 - 29	225.5	2029	190.2	2029	964,968	48.9%		
2029 - 30	227.2	2030	191.9	2030	976,002	49.0%		
2030 - 31	227.4	2031	192.2	2031	977,624	49.1%		
2031 - 32	228.0	2032	192.5	2032	980,267	49.0%		
2032 - 33	227.8	2033	192.6	2033	980,602	49.1%		
2033 - 34	228.0	2034	192.8	2034	981,886	49.2%		
2034 - 35	229.8	2035	194.6	2035	993,006	49.3%		
2035 - 36	230.4	2036	194.9	2036	996,007	49.2%		
2036 - 37	230.4	2037	195.2	2037	997,066	49.4%		
2037 - 38	230.8	2038	195.6	2038	999,497	49.4%		
2038 - 39	232.8	2039	197.5	2039	1,011,657	49.6%		
2039 - 40	233.5	2040	198.0	2040	1,015,446	49.5%		
2040 - 41	233.6	2041	198.4	2041	1,017,000	49.6%		
2041 - 42	234.2	2042	198.9	2042	1,020,118	49.6%		
2042 - 43	234.7	2043	199.4	2043	1,023,453	49.6%		
2043 - 44	237.2	2044	201.6	2044	1,037,627	49.8%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 3.6 percent a year for the period 2024-2044, compared to a 1.8 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 2.5 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 3.8 percent.

- Load factor decreases from 50.4% to 49.8% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Seasonal Residential	Small Commercial	Large Commercial	Public Street / Highway Lighting	Total Sales
5-Year	2018-2023	-1.4%	11.5%	-0.3%	-3.9%	-3.1%	-2.0%
	2024-2029	1.2%	0.2%	0.6%	30.2%	0.0%	13.5%
10-Year	2013-2023	-0.1%	13.5%	2.7%	-1.8%	-1.7%	-0.2%
	2024-2034	0.9%	0.0%	0.3%	14.3%	0.0%	6.7%
15-Year	2008-2023	-0.2%	N/A	1.7%	-0.5%	-0.3%	0.0%
	2024-2039	0.8%	0.1%	0.2%	9.5%	0.0%	4.6%
20-Year	2003-2023	0.6%	N/A	2.3%	-0.7%	0.0%	0.4%
	2024-2044	0.9%	0.1%	0.2%	7.1%	0.0%	3.6%

Growth rates shown are Compound Annual Growth Rates.

Narrative

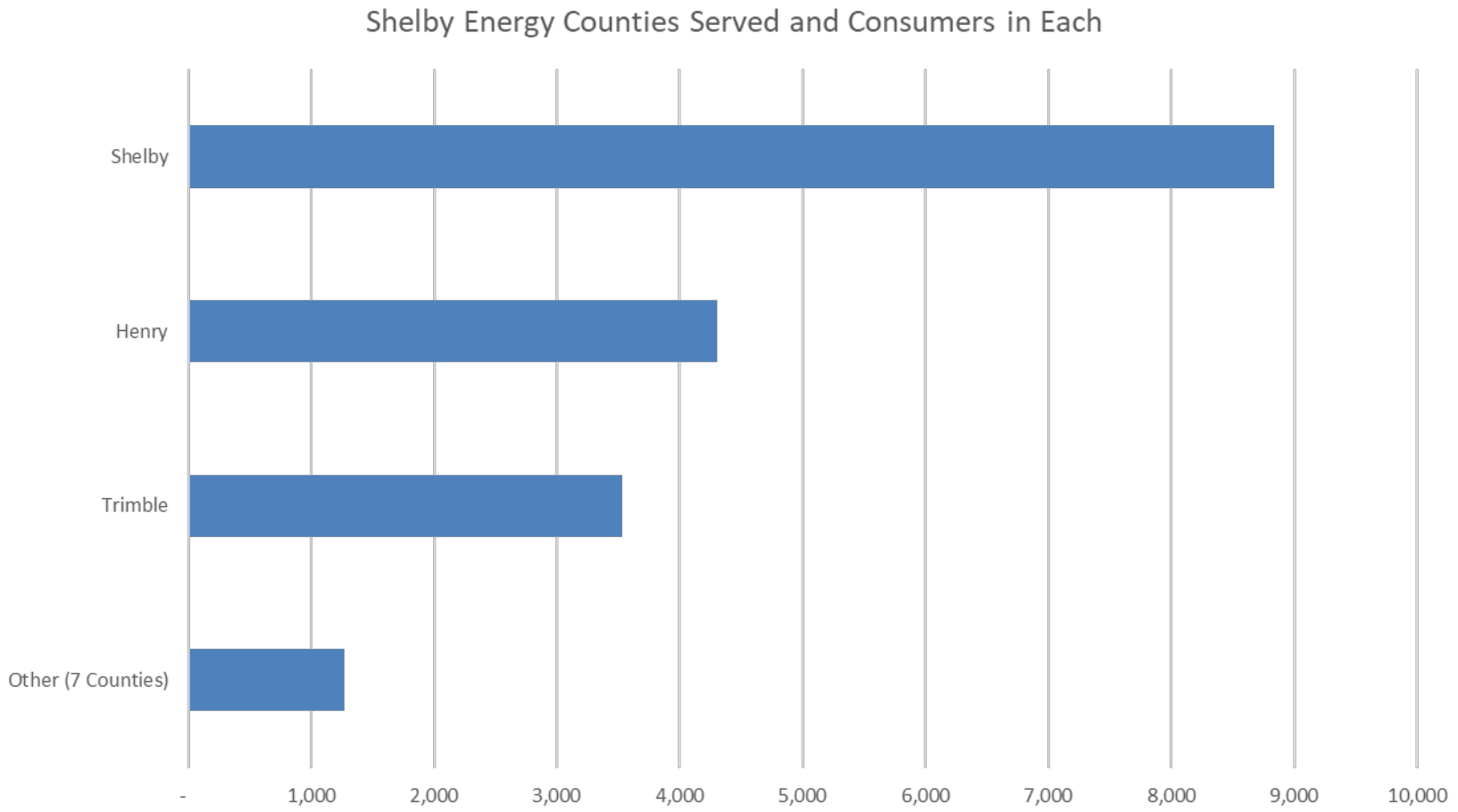
Shelby Energy is located in North Central Kentucky between Louisville and Lexington. The cooperative serves major portions of Henry, Shelby and Trimble Counties with a few members in seven surrounding counties. See Figure 1-1. The headquarters are located in Shelbyville (Shelby County), with an office in Bedford, Kentucky (Trimble County).

The average household has 2.16 people; 77 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

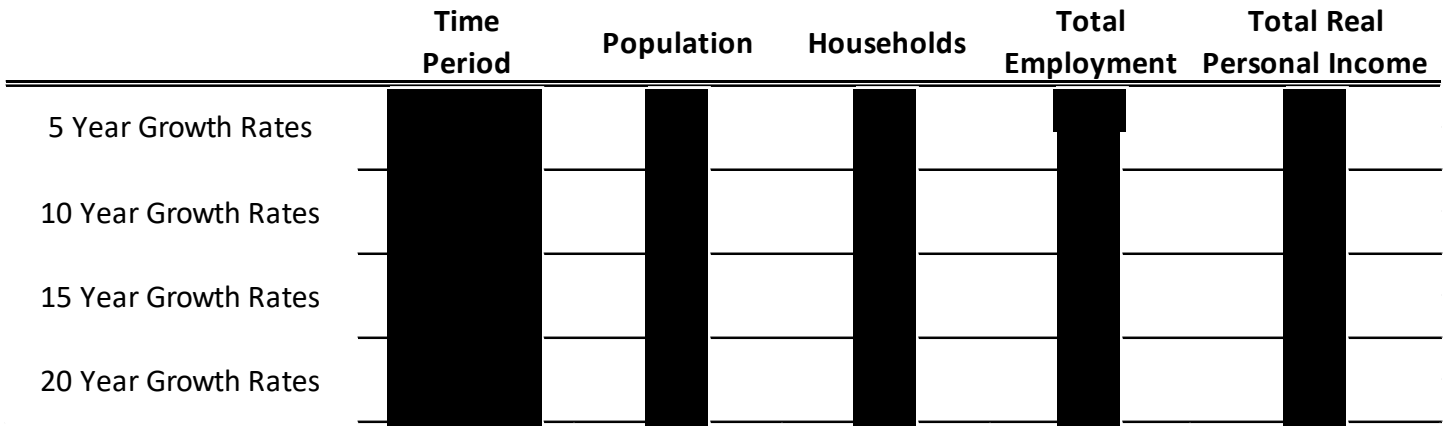
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 57% of consumers use electricity as a primary fuel for heating, while 16% use it as a secondary fuel.
  - 16% use electric furnaces and 39% use electric heat pumps.
- 97% of consumers use electricity for cooling
  - Of those with electric cooling, 90% use central air and 10% use electric window units.
- 83% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the SDF weather station at Standiford Field in Louisville.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Shelby Energy as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Shelby Energy experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4 Shelby Energy Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	500,439,567	3.9%	482,773,624	3.8%	17,665,943	3.5%	116.1	49.2%	15,639	2,121	7.4	$35,260,862	7.0
2015	498,300,344	-0.4%	480,203,219	-0.5%	18,097,125	3.6%	122.5	46.4%	15,854	2,126	7.5	$33,144,801	6.7
2016	516,352,906	3.6%	499,126,482	3.9%	17,226,424	3.3%	102.8	57.2%	15,941	2,129	7.5	$33,721,739	6.5
2017	500,695,586	-3.0%	484,760,655	-2.9%	15,934,931	3.2%	102.8	55.6%	16,136	2,139	7.5	$32,429,954	6.5
2018	524,856,128	4.8%	504,599,213	4.1%	20,256,915	3.9%	118.5	50.6%	16,438	2,147	7.7	$33,950,034	6.5
2019	516,054,722	-1.7%	497,905,283	-1.3%	18,149,439	3.5%	113.6	51.8%	16,709	2,158	7.7	$33,130,833	6.4
2020	487,869,520	-5.5%	474,096,837	-4.8%	13,772,683	2.8%	96.8	57.4%	16,931	2,167	7.8	$29,533,708	6.1
2021	482,573,686	-1.1%	468,506,237	-1.2%	14,067,449	2.9%	99.1	55.6%	17,211	2,178	7.9	$33,493,466	6.9
2022	497,086,072	3.0%	483,741,084	3.3%	13,344,988	2.7%	136.4	41.6%	17,455	2,196	7.9	$41,971,379	8.4
2023	475,570,198	-4.3%	456,235,216	-5.7%	19,334,982	4.1%	92.6	58.6%	17,834	2,214	8.1	$38,959,224	8.2
5 Year Average (2019-2023)						3.2%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Shelby Energy staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Shelby Energy staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Shelby Energy's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Shelby Energy's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	15,074	105	0.7	1,336	36	2.8	241,615	8,110	3.5
2015	15,214	140	0.9	1,259	-77	-5.8	229,816	-11,799	-4.9
2016	15,275	61	0.4	1,270	11	0.9	232,772	2,956	1.3
2017	15,447	172	1.1	1,209	-61	-4.8	224,148	-8,624	-3.7
2018	15,718	271	1.8	1,314	104	8.6	247,767	23,619	10.5
2019	15,967	249	1.6	1,268	-45	-3.5	242,995	-4,772	-1.9
2020	16,171	204	1.3	1,243	-25	-2.0	241,278	-1,717	-0.7
2021	16,488	317	2.0	1,243	0	0.0	245,955	4,677	1.9
2022	16,610	122	0.7	1,265	22	1.8	252,206	6,251	2.5
2023	16,912	302	1.8	1,136	-129	-10.2	230,622	-21,584	-8.6
2024	17,212	300	1.8	1,247	111	9.8	257,662	27,040	11.7
2025	17,487	275	1.6	1,250	2	0.2	262,256	4,594	1.8
2026	17,731	244	1.4	1,253	3	0.2	266,559	4,303	1.6
2027	17,943	212	1.2	1,252	0	0.0	269,642	3,082	1.2
2028	18,121	178	1.0	1,254	2	0.2	272,779	3,138	1.2
2029	18,265	144	0.8	1,248	-7	-0.5	273,488	708	0.3
2030	18,407	142	0.8	1,246	-2	-0.2	275,142	1,654	0.6
2031	18,544	137	0.7	1,244	-2	-0.1	276,795	1,653	0.6
2032	18,671	127	0.7	1,246	2	0.2	279,167	2,371	0.9
2033	18,798	127	0.7	1,240	-6	-0.5	279,766	599	0.2
2034	18,905	107	0.6	1,239	-1	-0.1	281,100	1,334	0.5
2035	19,002	97	0.5	1,240	1	0.1	282,757	1,658	0.6
2036	19,101	99	0.5	1,245	5	0.4	285,455	2,697	1.0
2037	19,209	108	0.6	1,243	-2	-0.2	286,624	1,169	0.4
2038	19,321	112	0.6	1,246	2	0.2	288,776	2,152	0.8
2039	19,433	112	0.6	1,249	3	0.2	291,159	2,384	0.8
2040	19,543	110	0.6	1,256	7	0.6	294,520	3,360	1.2
2041	19,655	112	0.6	1,255	0	0.0	296,109	1,589	0.5
2042	19,767	112	0.6	1,260	5	0.4	298,894	2,786	0.9
2043	19,874	107	0.5	1,265	5	0.4	301,796	2,902	1.0
2044	19,978	104	0.5	1,275	10	0.8	305,720	3,924	1.3

Methodology and Results *(continued)*

Seasonal Residential Forecast

Seasonal sales are projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Seasonal Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	115	21	22.3	268	2	0.9	370	70	23.5
2015	120	5	4.3	246	-23	-8.4	354	-17	-4.5
2016	125	5	4.2	277	31	12.8	416	62	17.5
2017	141	16	12.8	316	38	13.8	534	118	28.4
2018	144	3	2.1	360	44	14.0	621	88	16.4
2019	150	6	4.2	368	8	2.3	663	41	6.6
2020	161	11	7.3	343	-25	-6.9	662	-1	-0.1
2021	116	-45	-28.0	351	9	2.5	489	-173	-26.1
2022	222	106	91.4	282	-69	-19.6	753	264	53.9
2023	272	50	22.5	327	45	15.9	1,069	316	42.0
2024	279	7	2.6	320	-7	-2.2	1,072	3	0.3
2025	284	5	1.8	319	-1	-0.3	1,088	16	1.5
2026	284	0	0.0	320	0	0.2	1,090	2	0.2
2027	284	0	0.0	319	0	-0.1	1,088	-2	-0.1
2028	284	0	0.0	319	0	0.0	1,088	0	0.0
2029	284	0	0.0	318	-1	-0.4	1,084	-4	-0.4
2030	284	0	0.0	317	-1	-0.2	1,082	-2	-0.2
2031	284	0	0.0	317	-1	-0.2	1,080	-2	-0.2
2032	284	0	0.0	317	0	0.0	1,080	0	0.0
2033	284	0	0.0	316	-1	-0.3	1,077	-3	-0.3
2034	284	0	0.0	316	0	-0.1	1,076	-1	-0.1
2035	284	0	0.0	316	0	0.0	1,077	0	0.0
2036	284	0	0.0	317	1	0.2	1,079	2	0.2
2037	284	0	0.0	316	0	-0.1	1,078	-1	-0.1
2038	284	0	0.0	317	0	0.1	1,079	1	0.1
2039	284	0	0.0	317	0	0.1	1,081	2	0.1
2040	284	0	0.0	318	1	0.3	1,084	3	0.3
2041	284	0	0.0	318	0	0.0	1,085	0	0.0
2042	284	0	0.0	319	1	0.2	1,087	2	0.2
2043	284	0	0.0	320	1	0.3	1,090	3	0.3
2044	284	0	0.0	321	1	0.4	1,094	5	0.4

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-7.

Table 1-7
Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	411	56	15.8	197	9	4.6	81,069	14,137	21.1
2015	482	71	17.3	177	-20	-10.1	85,496	4,427	5.5
2016	500	18	3.7	182	4	2.5	90,937	5,441	6.4
2017	507	7	1.4	175	-7	-3.7	88,841	-2,096	-2.3
2018	533	26	5.1	167	-8	-4.6	89,086	245	0.3
2019	549	16	3.0	163	-4	-2.6	89,400	314	0.4
2020	555	6	1.1	148	-15	-9.2	82,080	-7,320	-8.2
2021	562	7	1.3	164	16	11.0	92,272	10,192	12.4
2022	577	15	2.7	160	-5	-2.8	92,056	-216	-0.2
2023	603	26	4.5	146	-14	-8.8	87,781	-4,275	-4.6
2024	623	20	3.3	144	-2	-1.3	89,493	1,712	2.0
2025	636	13	2.1	142	-1	-1.0	90,482	990	1.1
2026	649	13	2.0	141	-1	-1.0	91,379	896	1.0
2027	662	13	2.0	139	-2	-1.5	91,847	469	0.5
2028	674	12	1.8	137	-2	-1.2	92,404	556	0.6
2029	686	12	1.8	135	-3	-1.9	92,295	-109	-0.1
2030	697	11	1.6	132	-2	-1.7	92,136	-160	-0.2
2031	708	11	1.6	130	-2	-1.6	92,056	-79	-0.1
2032	718	10	1.4	128	-2	-1.2	92,246	189	0.2
2033	728	10	1.4	126	-2	-1.7	91,974	-272	-0.3
2034	738	10	1.4	125	-2	-1.5	91,885	-89	-0.1
2035	747	9	1.2	123	-2	-1.3	91,804	-81	-0.1
2036	756	9	1.2	122	-1	-1.0	92,013	209	0.2
2037	765	9	1.2	120	-2	-1.3	91,871	-142	-0.2
2038	774	9	1.2	119	-1	-0.9	92,074	203	0.2
2039	782	8	1.0	118	-1	-0.8	92,273	199	0.2
2040	790	8	1.0	117	-1	-0.7	92,580	308	0.3
2041	798	8	1.0	116	-1	-1.1	92,498	-83	-0.1
2042	805	7	0.9	115	-1	-0.6	92,730	232	0.3
2043	812	7	0.9	115	-1	-0.5	93,058	328	0.4
2044	819	7	0.9	114	0	-0.2	93,665	607	0.7

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Shelby Energy had 12 consumers in this class and consumers are projected to increase to 22 by 2044. Large commercial results are reported in Table 1-8.

Table 1-8

Large Commercial Summary

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	8	0	0.0	19,941	-598	-2.9	159,527	-4,781	-2.9
2015	8	0	0.0	20,543	602	3.0	164,344	4,817	3.0
2016	9	1	12.5	19,424	-1,119	-5.4	174,816	10,472	6.4
2017	9	0	0.0	19,007	-417	-2.1	171,067	-3,749	-2.1
2018	9	0	0.0	18,552	-456	-2.4	166,965	-4,102	-2.4
2019	10	1	11.1	16,470	-2,081	-11.2	164,702	-2,263	-1.4
2020	11	1	10.0	13,630	-2,840	-17.2	149,931	-14,771	-9.0
2021	11	0	0.0	11,787	-1,844	-13.5	129,652	-20,279	-13.5
2022	12	1	9.1	11,549	-237	-2.0	138,592	8,940	6.9
2023	12	0	0.0	11,386	-164	-1.4	136,627	-1,965	-1.4
2024	14	2	16.7	11,111	-274	-2.4	155,557	18,929	13.9
2025	17	3	21.4	16,960	5,849	52.6	288,321	132,764	85.3
2026	18	1	5.9	26,305	9,345	55.1	473,492	185,172	64.2
2027	18	0	0.0	32,328	6,023	22.9	581,897	108,405	22.9
2028	18	0	0.0	32,328	0	0.0	581,897	0	0.0
2029	18	0	0.0	32,328	0	0.0	581,897	0	0.0
2030	19	1	5.6	31,110	-1,217	-3.8	591,095	9,198	1.6
2031	19	0	0.0	31,110	0	0.0	591,095	0	0.0
2032	19	0	0.0	31,110	0	0.0	591,095	0	0.0
2033	19	0	0.0	31,110	0	0.0	591,095	0	0.0
2034	19	0	0.0	31,110	0	0.0	591,095	0	0.0
2035	20	1	5.3	30,015	-1,096	-3.5	600,293	9,198	1.6
2036	20	0	0.0	30,015	0	0.0	600,293	0	0.0
2037	20	0	0.0	30,015	0	0.0	600,293	0	0.0
2038	20	0	0.0	30,015	0	0.0	600,293	0	0.0
2039	21	1	5.0	29,023	-991	-3.3	609,491	9,198	1.5
2040	21	0	0.0	29,023	0	0.0	609,491	0	0.0
2041	21	0	0.0	29,023	0	0.0	609,491	0	0.0
2042	21	0	0.0	29,023	0	0.0	609,491	0	0.0
2043	21	0	0.0	29,023	0	0.0	609,491	0	0.0
2044	22	1	4.8	28,122	-901	-3.1	618,689	9,198	1.5

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Shelby Energy serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-9.

Table 1-9

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	31	0	0.0	517	82	18.8	192	30	18.8
2015	30	-1	-3.2	537	19	3.8	193	1	0.4
2016	32	2	6.7	484	-52	-9.7	186	-7	-3.7
2017	32	0	0.0	444	-41	-8.4	170	-16	-8.4
2018	34	2	6.3	391	-53	-12.0	159	-11	-6.5
2019	33	-1	-2.9	366	-25	-6.4	145	-15	-9.2
2020	33	0	0.0	368	3	0.7	146	1	0.7
2021	34	1	3.0	338	-30	-8.2	138	-8	-5.4
2022	34	0	0.0	330	-8	-2.5	135	-3	-2.5
2023	35	1	2.9	325	-5	-1.4	136	2	1.5
2024	35	0	0.0	331	6	1.8	139	2	1.8
2025	35	0	0.0	331	0	0.0	139	0	0.0
2026	35	0	0.0	331	0	0.0	139	0	0.0
2027	35	0	0.0	331	0	0.0	139	0	0.0
2028	35	0	0.0	331	0	0.0	139	0	0.0
2029	35	0	0.0	331	0	0.0	139	0	0.0
2030	35	0	0.0	331	0	0.0	139	0	0.0
2031	35	0	0.0	331	0	0.0	139	0	0.0
2032	35	0	0.0	331	0	0.0	139	0	0.0
2033	35	0	0.0	331	0	0.0	139	0	0.0
2034	35	0	0.0	331	0	0.0	139	0	0.0
2035	35	0	0.0	331	0	0.0	139	0	0.0
2036	35	0	0.0	331	0	0.0	139	0	0.0
2037	35	0	0.0	331	0	0.0	139	0	0.0
2038	35	0	0.0	331	0	0.0	139	0	0.0
2039	35	0	0.0	331	0	0.0	139	0	0.0
2040	35	0	0.0	331	0	0.0	139	0	0.0
2041	35	0	0.0	331	0	0.0	139	0	0.0
2042	35	0	0.0	331	0	0.0	139	0	0.0
2043	35	0	0.0	331	0	0.0	139	0	0.0
2044	35	0	0.0	331	0	0.0	139	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Shelby Energy's peak demands.

Table 1-10 reports the impact of extreme temperature on system demands.

Table 1-10: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		**Extreme**	
Degrees	2	-5	-9	-14
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Noncoincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	149	155	158	162
2025 - 26	194	200	203	207
2026 - 27	225	230	234	238
2027 - 28	226	231	235	239
2028 - 29	225	231	235	239
2029 - 30	227	233	236	241
2030 - 31	227	233	237	241
2031 - 32	228	234	237	242
2032 - 33	228	234	237	242
2033 - 34	228	234	238	242
2034 - 35	230	236	239	244
2035 - 36	230	237	240	245
2036 - 37	230	237	240	245
2037 - 38	231	237	241	245
2038 - 39	233	239	243	247
2039 - 40	234	240	243	248
2040 - 41	234	240	244	248
2041 - 42	234	241	244	249
2042 - 43	235	241	245	249
2043 - 44	237	244	247	252

Summer Peak Day Maximum Temperatures				
	Normal		**Extreme**	
Degrees	98	101	103	105
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Noncoincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	96	100	103	105
2025	125	129	131	134
2026	159	163	166	169
2027	190	194	197	199
2028	190	194	197	200
2029	190	194	197	200
2030	192	196	199	202
2031	192	196	199	202
2032	192	197	200	203
2033	193	197	200	203
2034	193	197	200	203
2035	195	199	202	205
2036	195	199	202	205
2037	195	200	203	206
2038	196	200	203	206
2039	198	202	205	208
2040	198	203	206	209
2041	198	203	206	209
2042	199	203	207	210
2043	199	204	207	210
2044	202	206	209	213

Farmers Rural Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

FARMERS RECC

A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE

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Introduction

Executive Summary

Farmers Rural Electric Cooperative Corporation (Farmers RECC) located in Glasgow, Kentucky, is an electric distribution cooperative that serves members in eleven counties. This load forecast report contains Farmers RECC's long-range forecast of energy and peak demand.

Farmers RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Farmers RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Farmers RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Farmers RECC. Cooperation helps to ensure that the forecast meets both parties' needs. Farmers RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Farmers RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street Highway Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	322,086	82,101	115,084	493	519,764	34	4.7	545,172
2015	304,948	86,027	118,465	486	509,926	39	4.5	534,203
2016	310,078	89,889	116,959	491	517,417	46	4.7	543,113
2017	292,437	87,681	105,994	463	486,575	32	4.9	511,691
2018	325,969	77,624	121,491	417	525,500	28	4.7	551,372
2019	312,725	79,292	108,045	369	500,431	28	4.6	524,796
2020	307,902	72,871	90,543	351	471,667	35	4.8	495,533
2021	314,259	75,290	97,240	348	487,136	34	4.9	512,484
2022	327,573	76,300	98,439	339	502,651	20	4.7	527,189
2023	292,211	73,851	95,842	336	462,240	19	4.7	485,310
2024	318,142	80,485	98,795	331	497,754	19	4.7	522,595
2025	325,512	82,617	98,793	331	507,253	19	4.7	532,568
2026	331,823	83,028	107,991	331	523,174	19	4.7	549,283
2027	336,317	83,045	107,991	331	527,685	19	4.7	554,020
2028	341,093	83,256	107,991	331	532,671	19	4.7	559,254
2029	343,279	83,027	107,991	331	534,629	19	4.7	561,309
2030	346,693	82,819	107,991	331	537,834	19	4.7	564,674
2031	350,297	82,696	107,991	331	541,316	19	4.7	568,330
2032	354,919	82,823	107,991	331	546,064	19	4.7	573,315
2033	357,080	82,541	107,991	331	547,943	19	4.7	575,288
2034	360,357	82,475	107,991	331	551,154	19	4.7	578,659
2035	364,131	82,455	107,991	331	554,909	19	4.7	582,601
2036	369,207	82,677	117,189	331	569,404	19	4.7	597,819
2037	372,089	82,581	117,189	331	572,191	19	4.7	600,744
2038	375,987	82,715	117,189	331	576,223	19	4.7	604,978
2039	380,019	82,855	117,189	331	580,395	19	4.7	609,358
2040	385,386	83,067	117,189	331	585,974	19	4.7	615,215
2041	388,275	82,906	117,189	331	588,701	19	4.7	618,078
2042	392,592	82,966	117,189	331	593,078	19	4.7	622,674
2043	396,992	83,103	117,189	331	597,615	19	4.7	627,437
2044	402,735	83,470	126,387	331	612,923	19	4.7	643,508

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Winter Temperature	Maximum Summer Temperature
2013 - 14	148.5	2014	116.1	2014	545,172	41.9%	2° F	96° F
2014 - 15	144.9	2015	107.9	2015	534,203	42.1%	-4° F	95° F
2015- 16	130.3	2016	109.8	2016	543,113	47.5%	10° F	94° F
2016 - 17	127.3	2017	111.5	2017	511,691	45.9%	9° F	97° F
2017 - 18	144.0	2018	112.5	2018	551,372	43.7%	2° F	97° F
2018 - 19	126.3	2019	108.7	2019	524,796	47.4%	11° F	97° F
2019 - 20	115.8	2020	110.5	2020	495,533	48.7%	14° F	95° F
2020 - 21	129.1	2021	110.7	2021	512,484	45.3%	8° F	97° F
2021 - 22	127.1	2022	115.1	2022	527,189	47.3%	3° F	101° F
2022 - 23	163.9	2023	111.5	2023	485,310	33.8%	-3° F	99° F
2023 - 24	152.2	2024	112.6	2024	522,595	39.1%	1° F	
2024 - 25	150.0	2025	113.6	2025	532,568	40.5%		
2025 - 26	153.2	2026	116.1	2026	549,283	40.9%		
2026 - 27	154.4	2027	116.6	2027	554,020	41.0%		
2027 - 28	155.8	2028	117.2	2028	559,254	40.9%		
2028 - 29	156.3	2029	117.5	2029	561,309	41.0%		
2029 - 30	157.1	2030	117.9	2030	564,674	41.0%		
2030 - 31	158.0	2031	118.3	2031	568,330	41.1%		
2031 - 32	159.3	2032	118.9	2032	573,315	41.0%		
2032 - 33	159.8	2033	119.2	2033	575,288	41.1%		
2033 - 34	160.6	2034	119.7	2034	578,659	41.1%		
2034 - 35	161.6	2035	120.2	2035	582,601	41.2%		
2035 - 36	164.5	2036	122.4	2036	597,819	41.4%		
2036 - 37	165.1	2037	122.9	2037	600,744	41.5%		
2037 - 38	166.1	2038	123.5	2038	604,978	41.6%		
2038 - 39	167.1	2039	124.1	2039	609,358	41.6%		
2039 - 40	168.6	2040	124.8	2040	615,215	41.6%		
2040 - 41	169.1	2041	125.3	2041	618,078	41.7%		
2041 - 42	170.1	2042	126.0	2042	622,674	41.8%		
2042 - 43	171.2	2043	126.7	2043	627,437	41.8%		
2043 - 44	174.3	2044	129.0	2044	643,508	42.2%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.0 percent a year for the period 2024-2044, compared to a 0.9 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.8 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 0.7 percent.

- Load factor increases from 40.5% to 42.2% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street / Highway Lighting	Total Sales
5-Year	2018-2023	-2.2%	-1.0%	-4.6%	-4.3%	-2.5%
	2024-2029	1.5%	0.6%	1.8%	0.0%	1.4%
10-Year	2013-2023	-0.6%	-0.7%	-0.9%	-3.6%	-0.7%
	2024-2034	1.3%	0.2%	0.9%	0.0%	1.0%
15-Year	2008-2023	-0.7%	0.4%	-1.0%	-1.9%	-0.6%
	2024-2039	1.2%	0.2%	1.1%	0.0%	1.0%
20-Year	2003-2023	0.0%	0.2%	-0.8%	-0.9%	-0.1%
	2024-2044	1.2%	0.2%	1.2%	0.0%	1.0%

Growth rates shown are Compound Annual Growth Rates.

Narrative

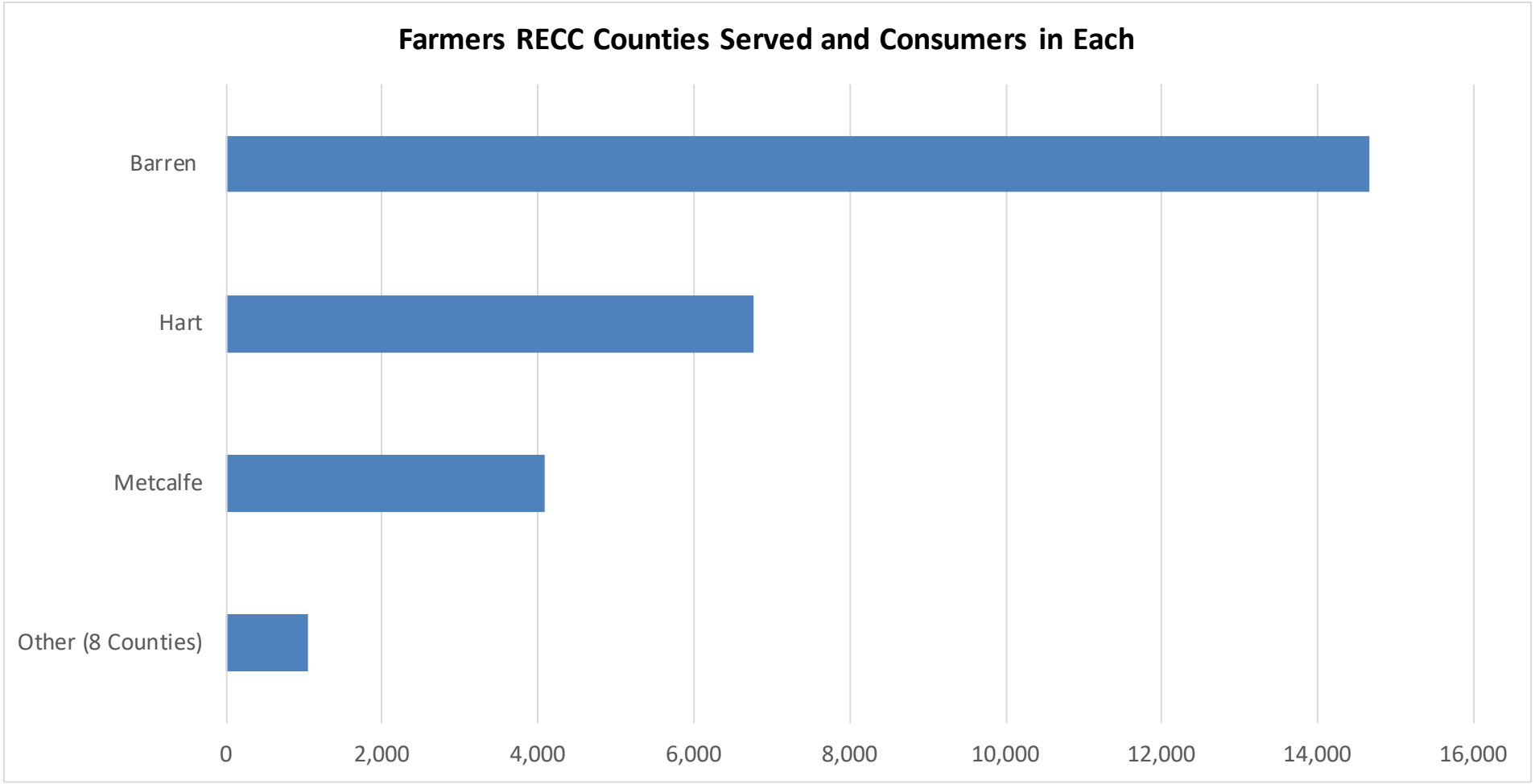
Farmers RECC is located in South Central Kentucky in Glasgow. The cooperative serves major portions of Barren, Hart, and Metcalfe Counties with other members in eight surrounding counties. See Figure 1-1.

The average household contains 2.23 people and nearly 79% of homes are headed by someone of age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

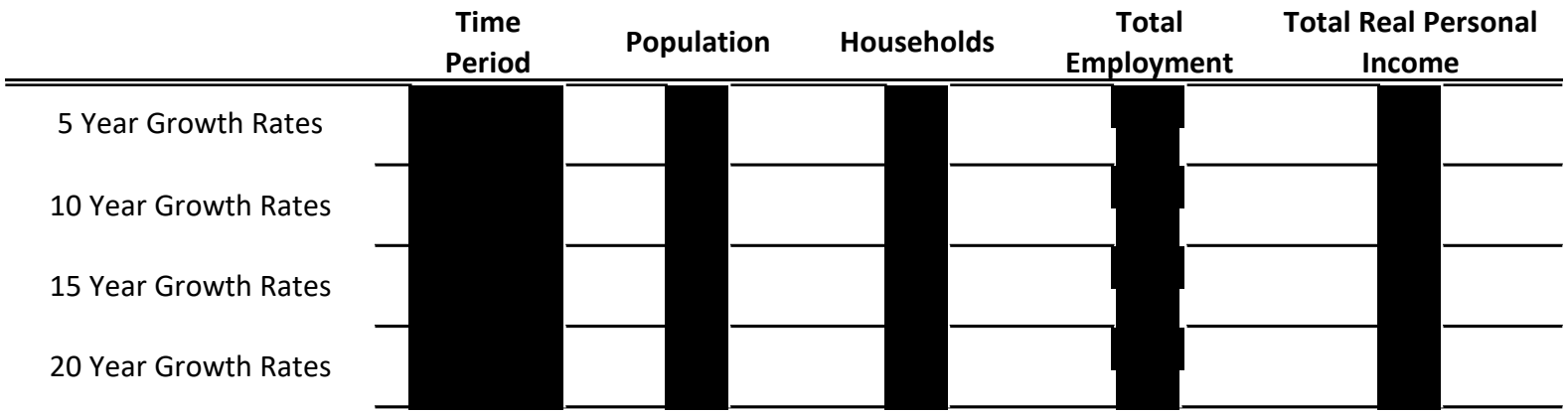
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 55% of consumers use electricity as a primary fuel for heating, while 25% use it as a secondary fuel.
  - 16% use electric furnaces and 29% use electric heat pumps.
- 97% of consumers use electricity for cooling
  - Of those with electric cooling, 84% use central air and 16% use electric window units.
- 91% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the BWG weather station at Bowling Green Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Farmers RECC as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Farmers RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Farmers RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	545,171,741	4.8%	519,764,221	5.2%	25,373,354	4.7%	141.3	44.0%	24,894	3,624	6.9	$38,924,102	7.1
2015	534,202,528	-2.0%	509,926,233	-1.9%	24,237,256	4.5%	139.4	43.7%	24,987	3,632	6.9	$36,226,666	6.8
2016	543,112,920	1.7%	517,416,970	1.5%	25,649,865	4.7%	120.7	51.2%	25,122	3,648	6.9	$36,337,396	6.7
2017	511,690,828	-5.8%	486,574,671	-6.0%	25,084,322	4.9%	119.1	49.0%	25,294	3,659	6.9	$34,419,738	6.7
2018	551,371,846	7.8%	525,500,450	8.0%	25,843,082	4.7%	140.1	44.9%	25,421	3,673	6.9	$36,762,605	6.7
2019	524,796,489	-4.8%	500,430,672	-4.8%	24,337,949	4.6%	118.1	50.7%	25,544	3,690	6.9	$34,987,459	6.7
2020	495,532,833	-5.6%	471,666,904	-5.7%	23,831,427	4.8%	107.5	52.5%	25,783	3,706	7.0	$31,080,231	6.3
2021	512,484,310	3.4%	487,136,226	3.3%	25,314,531	4.9%	115.0	50.9%	26,067	3,725	7.0	$36,452,749	7.1
2022	527,188,650	2.9%	502,651,193	3.2%	24,517,648	4.7%	151.6	39.7%	26,316	3,750	7.0	$45,844,519	8.7
2023	485,310,332	-7.9%	462,239,573	-8.0%	23,052,009	4.7%	104.1	53.2%	26,525	3,767	7.0	$41,268,615	8.5

5 Year Average (2019-2023) 4.8%

Methodology and Results *(continued)*

The preliminary forecast was presented to Farmers RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Farmers RECC staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Farmers RECC's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Farmers RECC's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	23,009	87	0.4	1,167	41	3.6	322,086	12,498	4.0
2015	23,087	78	0.3	1,101	-66	-5.6	304,948	-17,138	-5.3
2016	23,239	152	0.7	1,112	11	1.0	310,078	5,130	1.7
2017	23,419	180	0.8	1,041	-71	-6.4	292,437	-17,641	-5.7
2018	23,490	71	0.3	1,156	116	11.1	325,969	33,532	11.5
2019	23,652	162	0.7	1,102	-55	-4.7	312,725	-13,244	-4.1
2020	23,949	297	1.3	1,071	-30	-2.8	307,902	-4,822	-1.5
2021	24,237	288	1.2	1,081	9	0.9	314,259	6,356	2.1
2022	24,452	215	0.9	1,116	36	3.3	327,573	13,314	4.2
2023	24,654	202	0.8	988	-129	-11.5	292,211	-35,362	-10.8
2024	24,912	258	1.0	1,064	76	7.7	318,142	25,931	8.9
2025	25,156	244	1.0	1,078	14	1.3	325,512	7,369	2.3
2026	25,378	222	0.9	1,090	11	1.0	331,823	6,312	1.9
2027	25,581	203	0.8	1,096	6	0.6	336,317	4,494	1.4
2028	25,759	179	0.7	1,103	8	0.7	341,093	4,776	1.4
2029	25,920	160	0.6	1,104	0	0.0	343,279	2,186	0.6
2030	26,078	158	0.6	1,108	4	0.4	346,693	3,413	1.0
2031	26,235	158	0.6	1,113	5	0.4	350,297	3,605	1.0
2032	26,380	145	0.6	1,121	8	0.8	354,919	4,621	1.3
2033	26,515	134	0.5	1,122	1	0.1	357,080	2,162	0.6
2034	26,640	126	0.5	1,127	5	0.4	360,357	3,277	0.9
2035	26,757	116	0.4	1,134	7	0.6	364,131	3,775	1.0
2036	26,867	111	0.4	1,145	11	1.0	369,207	5,076	1.4
2037	26,980	113	0.4	1,149	4	0.4	372,089	2,882	0.8
2038	27,087	107	0.4	1,157	7	0.6	375,987	3,897	1.0
2039	27,185	98	0.4	1,165	8	0.7	380,019	4,033	1.1
2040	27,280	95	0.3	1,177	12	1.1	385,386	5,367	1.4
2041	27,365	85	0.3	1,182	5	0.4	388,275	2,889	0.7
2042	27,438	73	0.3	1,192	10	0.8	392,592	4,317	1.1
2043	27,497	59	0.2	1,203	11	0.9	396,992	4,400	1.1
2044	27,549	52	0.2	1,218	15	1.3	402,735	5,742	1.4

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,873	-10	-0.5	44	2	4.8	82,101	2,687	3.4
2015	1,889	16	0.9	46	2	4.5	86,027	3,927	4.8
2016	1,872	-17	-0.9	48	2	4.3	89,889	3,861	4.5
2017	1,864	-8	-0.4	47	-1	-2.1	87,681	-2,208	-2.5
2018	1,918	54	2.9	40	-7	-14.9	77,624	-10,057	-11.5
2019	1,880	-38	-2.0	42	2	5.0	79,292	1,669	2.1
2020	1,822	-58	-3.1	40	-2	-4.8	72,871	-6,421	-8.1
2021	1,818	-4	-0.2	41	1	2.5	75,290	2,418	3.3
2022	1,852	34	1.9	41	0	0.0	76,300	1,011	1.3
2023	1,859	7	0.4	40	-1	-2.4	73,851	-2,449	-3.2
2024	1,864	5	0.3	43	3	7.5	80,485	6,633	9.0
2025	1,867	3	0.2	44	1	2.3	82,617	2,132	2.6
2026	1,870	3	0.2	44	0	0.0	83,028	411	0.5
2027	1,872	2	0.1	44	0	0.0	83,045	18	0.0
2028	1,874	2	0.1	44	0	0.0	83,256	210	0.3
2029	1,876	2	0.1	44	0	0.0	83,027	-229	-0.3
2030	1,877	1	0.1	44	0	0.0	82,819	-208	-0.3
2031	1,878	1	0.1	44	0	0.0	82,696	-122	-0.1
2032	1,879	1	0.1	44	0	0.0	82,823	126	0.2
2033	1,880	1	0.1	44	0	0.0	82,541	-282	-0.3
2034	1,881	1	0.1	44	0	0.0	82,475	-66	-0.1
2035	1,881	0	0.0	44	0	0.0	82,455	-20	0.0
2036	1,882	1	0.1	44	0	0.0	82,677	222	0.3
2037	1,883	1	0.1	44	0	0.0	82,581	-96	-0.1
2038	1,885	2	0.1	44	0	0.0	82,715	135	0.2
2039	1,886	1	0.1	44	0	0.0	82,855	140	0.2
2040	1,887	1	0.1	44	0	0.0	83,067	212	0.3
2041	1,888	1	0.1	44	0	0.0	82,906	-161	-0.2
2042	1,889	1	0.1	44	0	0.0	82,966	60	0.1
2043	1,890	1	0.1	44	0	0.0	83,103	137	0.2
2044	1,891	1	0.1	44	0	0.0	83,470	367	0.4

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Farmers RECC had 6 consumers in this class and consumers are projected to increase to 9 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	5	1	25.0	23,017	-3,149	-12.0	115,084	10,419	10.0
2015	4	-1	-20.0	29,616	6,599	28.7	118,465	3,381	2.9
2016	4	0	0.0	29,240	-376	-1.3	116,959	-1,506	-1.3
2017	4	0	0.0	26,498	-2,741	-9.4	105,994	-10,965	-9.4
2018	6	2	50.0	20,248	-6,250	-23.6	121,491	15,497	14.6
2019	6	0	0.0	18,007	-2,241	-11.1	108,045	-13,446	-11.1
2020	6	0	0.0	15,090	-2,917	-16.2	90,543	-17,502	-16.2
2021	6	0	0.0	16,207	1,116	7.4	97,240	6,697	7.4
2022	6	0	0.0	16,407	200	1.2	98,439	1,199	1.2
2023	6	0	0.0	15,974	-433	-2.6	95,842	-2,597	-2.6
2024	6	0	0.0	16,466	492	3.1	98,795	2,954	3.1
2025	6	0	0.0	16,466	0	0.0	98,793	-2	0.0
2026	7	1	16.7	15,427	-1,038	-6.3	107,991	9,198	9.3
2027	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2028	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2029	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2030	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2031	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2032	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2033	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2034	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2035	7	0	0.0	15,427	0	0.0	107,991	0	0.0
2036	8	1	14.3	14,649	-779	-5.0	117,189	9,198	8.5
2037	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2038	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2039	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2040	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2041	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2042	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2043	8	0	0.0	14,649	0	0.0	117,189	0	0.0
2044	9	1	12.5	14,043	-606	-4.1	126,387	9,198	7.8

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Farmers RECC serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	7	0	0.0	5,865	109	1.9	493	9	1.9
2015	7	0	0.0	5,784	-81	-1.4	486	-7	-1.4
2016	7	0	0.0	5,849	65	1.1	491	5	1.1
2017	7	0	0.0	5,512	-336	-5.8	463	-28	-5.8
2018	7	0	0.0	4,966	-546	-9.9	417	-46	-9.9
2019	6	-1	-14.3	5,125	159	3.2	369	-48	-11.5
2020	6	0	0.0	4,868	-256	-5.0	351	-18	-5.0
2021	6	0	0.0	4,831	-37	-0.8	348	-3	-0.8
2022	6	0	0.0	4,707	-124	-2.6	339	-9	-2.6
2023	6	0	0.0	4,661	-47	-1.0	336	-3	-1.0
2024	6	0	0.0	4,600	-60	-1.3	331	-4	-1.3
2025	6	0	0.0	4,600	0	0.0	331	0	0.0
2026	6	0	0.0	4,600	0	0.0	331	0	0.0
2027	6	0	0.0	4,600	0	0.0	331	0	0.0
2028	6	0	0.0	4,600	0	0.0	331	0	0.0
2029	6	0	0.0	4,600	0	0.0	331	0	0.0
2030	6	0	0.0	4,600	0	0.0	331	0	0.0
2031	6	0	0.0	4,600	0	0.0	331	0	0.0
2032	6	0	0.0	4,600	0	0.0	331	0	0.0
2033	6	0	0.0	4,600	0	0.0	331	0	0.0
2034	6	0	0.0	4,600	0	0.0	331	0	0.0
2035	6	0	0.0	4,600	0	0.0	331	0	0.0
2036	6	0	0.0	4,600	0	0.0	331	0	0.0
2037	6	0	0.0	4,600	0	0.0	331	0	0.0
2038	6	0	0.0	4,600	0	0.0	331	0	0.0
2039	6	0	0.0	4,600	0	0.0	331	0	0.0
2040	6	0	0.0	4,600	0	0.0	331	0	0.0
2041	6	0	0.0	4,600	0	0.0	331	0	0.0
2042	6	0	0.0	4,600	0	0.0	331	0	0.0
2043	6	0	0.0	4,600	0	0.0	331	0	0.0
2044	6	0	0.0	4,600	0	0.0	331	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Farmers RECC's peak demands.

Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		Extreme	
Degrees F	2	-4	-8	-12
Occurs Once in …	2 Years	5 Years	10 Years	30 Years
Non-Coincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	150	161	165	170
2025 - 26	153	164	169	173
2026 - 27	154	165	170	174
2027 - 28	156	167	171	176
2028 - 29	156	167	172	177
2029 - 30	157	168	173	177
2030 - 31	158	169	174	178
2031 - 32	159	170	175	180
2032 - 33	160	171	176	180
2033 - 34	161	172	177	181
2034 - 35	162	173	178	182
2035 - 36	164	176	181	185
2036 - 37	165	176	181	186
2037 - 38	166	177	182	187
2038 - 39	167	178	183	188
2039 - 40	169	180	185	190
2040 - 41	169	180	185	190
2041 - 42	170	182	186	191
2042 - 43	171	183	188	192
2043 - 44	174	186	191	196

Summer Peak Day Maximum Temperatures				
	Normal		Extreme	
Degrees F	99	103	105	107
Occurs Once in …	2 Years	5 Years	10 Years	30 Years
Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	113	120	124	127
2025	114	121	125	129
2026	116	124	127	131
2027	117	124	128	132
2028	117	125	129	133
2029	117	125	129	133
2030	118	126	130	133
2031	118	126	130	134
2032	119	127	131	135
2033	119	127	131	135
2034	120	128	132	136
2035	120	128	132	136
2036	122	130	134	138
2037	123	131	135	139
2038	123	131	136	140
2039	124	132	136	140
2040	125	133	137	141
2041	125	133	138	142
2042	126	134	138	142
2043	127	135	139	143
2044	129	137	141	145

Owen Electric Cooperative

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

OWEN Electric
A Touchstone Energy Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

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Introduction

Executive Summary

Owen Electric Cooperative (Owen Electric) located in Owenton, Kentucky, is an electric distribution cooperative that serves members in nine counties. This load forecast report contains Owen Electric's long-range forecast of energy and peak demand.

Owen Electric and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Owen Electric for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Owen Electric. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Owen Electric. Cooperation helps to ensure that the forecast meets both parties' needs. Owen Electric uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Owen Electric is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Other Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	748,500	214,493	26,190	1,273,355	781	2,263,320	2,182	3.1	2,339,181
2015	746,252	239,044	25,911	1,075,655	690	2,087,552	2,113	2.1	2,134,263
2016	757,168	238,718	24,756	1,176,771	1,053	2,198,467	2,265	2.3	2,252,572
2017	724,410	238,286	24,401	1,252,562	922	2,240,581	2,344	1.8	2,284,295
2018	812,290	247,241	26,622	1,294,479	894	2,381,526	2,543	1.6	2,423,377
2019	797,853	244,223	26,345	1,304,782	872	2,374,074	2,455	1.4	2,409,450
2020	788,028	228,741	22,923	1,267,252	896	2,307,841	2,214	1.5	2,346,389
2021	804,959	216,118	25,281	1,296,802	481	2,343,641	2,063	1.8	2,388,421
2022	824,075	209,918	25,046	1,479,459	400	2,538,898	1,874	1.9	2,588,671
2023	761,199	206,263	25,017	1,786,020	403	2,778,902	1,787	1.5	2,821,760
2024	837,045	210,137	24,670	1,901,281	388	2,973,521	1,831	1.3	3,013,707
2025	852,690	211,210	25,152	2,076,590	388	3,166,030	1,831	1.2	3,207,402
2026	870,976	212,622	25,152	2,228,763	388	3,337,901	1,831	1.2	3,379,833
2027	886,133	212,876	25,152	2,254,326	388	3,378,876	1,831	1.2	3,421,507
2028	902,618	213,872	25,152	2,268,853	388	3,410,883	1,831	1.2	3,454,273
2029	912,456	213,726	25,248	2,272,722	388	3,424,541	1,831	1.2	3,468,470
2030	925,923	213,801	25,248	2,272,722	388	3,438,082	1,831	1.2	3,482,395
2031	940,128	214,097	25,248	2,281,920	388	3,461,781	1,831	1.2	3,506,768
2032	956,836	214,895	25,248	2,296,447	388	3,493,814	1,831	1.2	3,539,560
2033	967,284	214,723	25,345	2,300,316	388	3,508,056	1,831	1.3	3,554,359
2034	981,128	215,194	25,345	2,309,514	388	3,531,568	1,831	1.3	3,578,539
2035	996,748	215,917	25,345	2,309,514	388	3,547,912	1,831	1.3	3,595,347
2036	1,016,053	217,365	25,345	2,324,041	388	3,583,192	1,831	1.3	3,631,478
2037	1,029,227	217,882	25,441	2,327,910	388	3,600,848	1,831	1.3	3,649,787
2038	1,045,885	219,118	25,441	2,337,108	388	3,627,941	1,831	1.3	3,677,650
2039	1,063,192	220,289	25,441	2,337,108	388	3,646,418	1,831	1.3	3,696,652
2040	1,084,373	221,690	25,441	2,351,635	388	3,683,528	1,831	1.3	3,734,665
2041	1,098,960	221,995	25,537	2,355,504	388	3,702,385	1,831	1.3	3,754,209
2042	1,118,017	222,984	25,537	2,364,702	388	3,731,629	1,831	1.3	3,784,285
2043	1,137,207	223,931	25,537	2,373,900	388	3,760,964	1,831	1.4	3,814,453
2044	1,160,431	225,565	25,537	2,379,229	388	3,791,150	1,831	1.4	3,845,345

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*					
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temp	Maximum Temp	Annual Degree Days
2013 - 14	503.2	2014	439.3	2014	2,339,181	53.1%	-6° F	91° F	5,391
2014 - 15	486.5	2015	436.2	2015	2,134,263	50.1%	-12° F	91° F	4,716
2015 - 16	446.2	2016	453.4	2016	2,252,572	56.6%	5° F	94° F	4,837
2016 - 17	435.3	2017	446.5	2017	2,284,295	58.4%	6° F	90° F	4,335
2017 - 18	479.6	2018	450.7	2018	2,423,377	57.7%	-7° F	96° F	5,536
2018 - 19	510.3	2019	459.3	2019	2,409,450	53.9%	-7° F	93° F	5,067
2019 - 20	476.6	2020	454.5	2020	2,346,389	56.2%	14° F	95° F	4,603
2020 - 21	471.0	2021	438.3	2021	2,388,421	57.9%	4° F	93° F	4,749
2021 - 22	438.1	2022	445.5	2022	2,588,671	66.3%	3° F	95° F	4,979
2022 - 23	620.1	2023	536.4	2023	2,821,760	51.9%	-8° F	94° F	4,104
2023 - 24	680.6	2024	560.6	2024	3,013,707	50.5%	-2° F		
2024 - 25	688.5	2025	650.0	2025	3,207,402	53.2%			
2025 - 26	691.6	2026	652.3	2026	3,379,833	55.8%			
2026 - 27	694.6	2027	655.7	2027	3,421,507	56.2%			
2027 - 28	699.2	2028	659.4	2028	3,454,273	56.4%		**Normals**	
2028 - 29	702.1	2029	662.4	2029	3,468,470	56.4%			
2029 - 30	704.2	2030	664.3	2030	3,482,395	56.4%	**-2° F**	**96° F**	**4,911**
2030 - 31	708.0	2031	668.0	2031	3,506,768	56.5%			
2031 - 32	712.5	2032	671.8	2032	3,539,560	56.7%			
2032 - 33	715.4	2033	675.1	2033	3,554,359	56.7%			
2033 - 34	719.2	2034	678.8	2034	3,578,539	56.8%			
2034 - 35	721.8	2035	681.3	2035	3,595,347	56.9%			
2035 - 36	726.8	2036	685.7	2036	3,631,478	57.0%			
2036 - 37	730.2	2037	689.6	2037	3,649,787	57.1%			
2037 - 38	734.4	2038	693.9	2038	3,677,650	57.2%			
2038 - 39	737.3	2039	696.7	2039	3,696,652	57.2%			
2039 - 40	742.5	2040	701.4	2040	3,734,665	57.4%			
2040 - 41	746.0	2041	705.5	2041	3,754,209	57.5%			
2041 - 42	750.5	2042	710.1	2042	3,784,285	57.6%			
2042 - 43	755.0	2043	714.7	2043	3,814,453	57.7%			
2043 - 44	759.0	2044	718.2	2044	3,845,345	57.8%			

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.2 percent a year for the period 2024-2044, compared to a 2.2 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.5 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.2 percent.

- Load factor increases from 53.2% to 57.8% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Public Buildings	Small Commercial	Large Commercial	Large Commercial Special Contract Sales (MWh)	Public Street and Highway Lighting	Total Sales
5-Year	2018-2023	-1.3%	-1.2%	-3.6%	5.5%	7.0%	-14.7%	3.1%
	2024-2029	1.7%	0.5%	0.3%	3.5%	3.7%	0.0%	2.9%
10-Year	2013-2023	0.3%	0.1%	-1.7%	4.3%	3.8%	-7.4%	2.2%
	2024-2034	1.6%	0.3%	0.2%	2.8%	1.8%	0.0%	1.7%
15-Year	2008-2023	0.2%	0.7%	-0.3%	2.1%	3.1%	-3.1%	1.7%
	2024-2039	1.6%	0.2%	0.3%	2.4%	1.2%	0.0%	1.4%
20-Year	2003-2023	1.0%	3.8%	1.6%	6.2%	1.6%	-2.5%	1.9%
	2024-2044	1.6%	0.2%	0.4%	2.2%	0.9%	0.0%	1.2%

Growth rates shown are Compound Annual Growth Rates.

Narrative

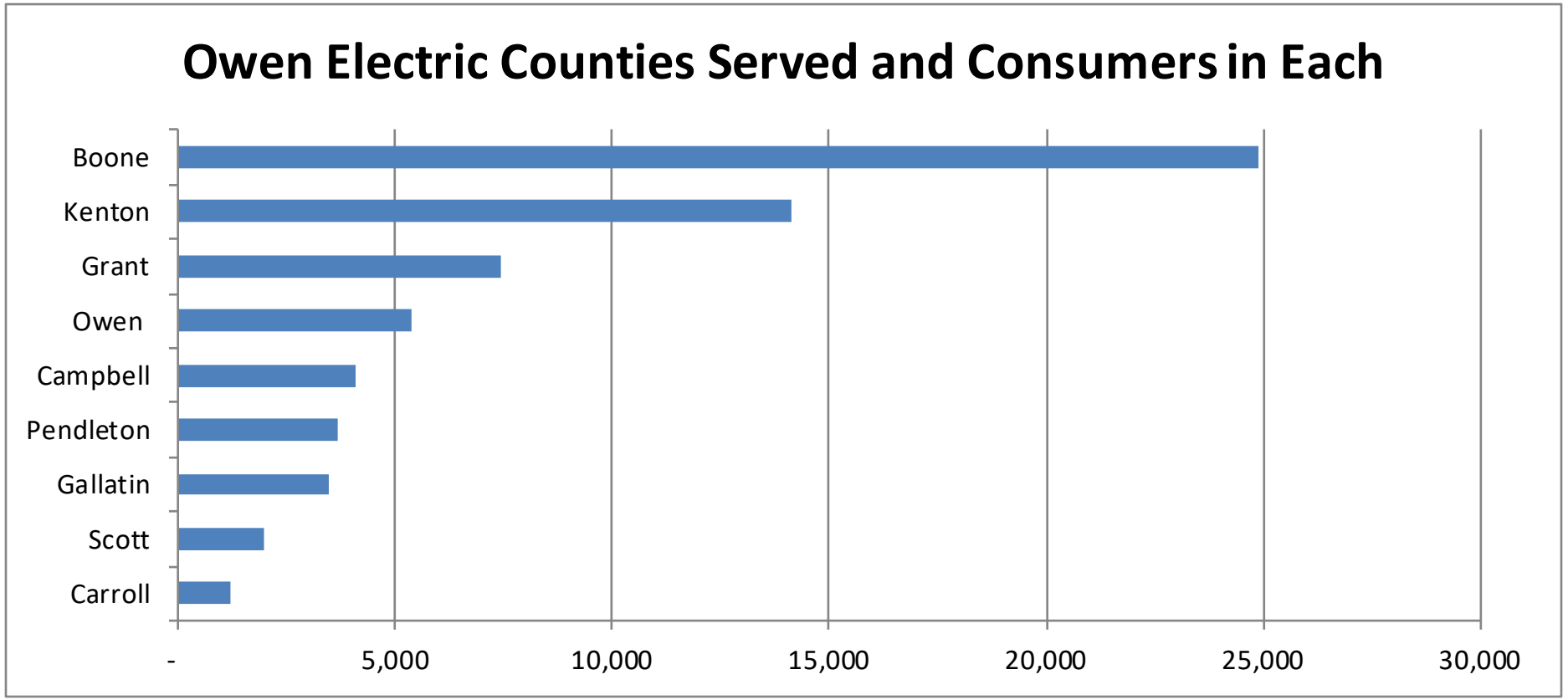
The service area of Owen Electric Cooperative is located in the Northern Kentucky counties of Boone, Campbell, Carroll, Gallatin, Grant, Kenton, Owen, Pendleton, and Scott (see Figure 1-1).

The average household has 2.47 people; 72 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

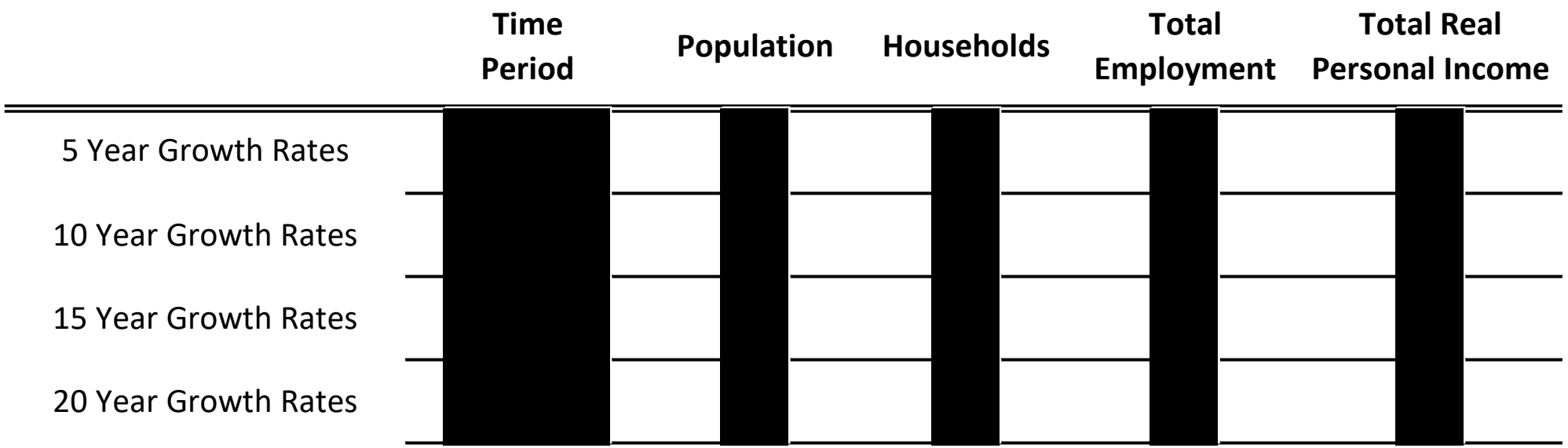
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 42% of consumers use electricity as a primary fuel for heating, while 21% use it as a secondary fuel.
  - 13% use electric furnaces and 27% use electric heat pumps.
- 97% of consumers use electricity for cooling
  - Of those with electric cooling, 94% use central air and 6% use electric window units.
- 67% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the CVG weather station at Cincinnati/Northern Kentucky International Airport Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Owen Electric as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Owen Electric experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Owen Electric Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	2,339,180,734	2.8%	2,263,319,725	1.7%	74,844,161	3.2%	454.3	58.8%	58,578	4,530	12.9	$146,111,508	6.2
2015	2,134,263,162	-8.8%	2,087,552,188	-7.8%	45,669,696	2.1%	445.3	54.7%	59,409	4,522	13.1	$124,320,035	5.8
2016	2,252,572,338	5.5%	2,198,467,313	5.3%	52,902,943	2.3%	403.9	63.5%	60,120	4,562	13.2	$128,491,616	5.7
2017	2,284,294,624	1.4%	2,240,580,652	1.9%	41,814,776	1.8%	401.4	65.0%	60,886	4,516	13.5	$127,568,419	5.6
2018	2,423,377,414	6.1%	2,381,525,588	6.3%	39,963,305	1.6%	465.2	59.5%	61,596	4,565	13.5	$136,273,364	5.6
2019	2,409,450,179	-0.6%	2,374,073,792	-0.3%	33,517,613	1.4%	479.6	57.3%	62,278	4,591	13.6	$133,210,722	5.5
2020	2,346,388,515	-2.6%	2,307,840,582	-2.8%	36,503,924	1.6%	422.7	63.2%	63,141	4,631	13.6	$119,955,091	5.1
2021	2,388,421,179	1.8%	2,343,641,404	1.6%	42,649,212	1.8%	450.5	60.5%	64,311	4,627	13.9	$140,260,938	5.9
2022	2,588,670,662	8.4%	2,538,898,437	8.3%	47,677,273	1.8%	653.6	45.2%	65,227	4,663	14.0	$186,428,622	7.2
2023	2,821,759,665	9.0%	2,778,902,230	9.5%	40,674,103	1.4%	581.0	55.4%	65,994	4,693	14.1	$192,664,513	6.8

5 Year Average (2019-2023) 1.6%

Methodology and Results *(continued)*

The preliminary forecast was presented to Owen Electric staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Owen Electric staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Owen Electric's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Owen Electric's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	55,937	441	0.8	1,115	9	0.8	748,500	12,005	1.6
2015	56,754	817	1.5	1,096	-19	-1.7	746,252	-2,248	-0.3
2016	57,433	679	1.2	1,099	3	0.3	757,168	10,916	1.5
2017	58,125	692	1.2	1,039	-60	-5.5	724,410	-32,758	-4.3
2018	58,810	685	1.2	1,151	112	10.8	812,290	87,880	12.1
2019	59,460	650	1.1	1,118	-33	-2.9	797,853	-14,437	-1.8
2020	60,292	832	1.4	1,089	-29	-2.6	788,028	-9,824	-1.2
2021	61,393	1,101	1.8	1,093	3	0.3	804,959	16,931	2.1
2022	62,266	873	1.4	1,103	10	0.9	824,075	19,116	2.4
2023	62,998	732	1.2	1,007	-96	-8.7	761,199	-62,876	-7.6
2024	63,810	812	1.3	1,093	86	8.6	837,045	75,846	10.0
2025	64,660	850	1.3	1,099	6	0.5	852,690	15,645	1.9
2026	65,559	899	1.4	1,107	8	0.7	870,976	18,286	2.1
2027	66,454	895	1.4	1,111	4	0.4	886,133	15,157	1.7
2028	67,319	865	1.3	1,117	6	0.6	902,618	16,485	1.9
2029	68,156	837	1.2	1,116	-2	-0.2	912,456	9,838	1.1
2030	69,015	859	1.3	1,118	2	0.2	925,923	13,466	1.5
2031	69,898	883	1.3	1,121	3	0.3	940,128	14,205	1.5
2032	70,757	859	1.2	1,127	6	0.5	956,836	16,708	1.8
2033	71,617	860	1.2	1,126	-1	-0.1	967,284	10,449	1.1
2034	72,477	860	1.2	1,128	3	0.2	981,128	13,843	1.4
2035	73,302	825	1.1	1,133	5	0.4	996,748	15,621	1.6
2036	74,115	813	1.1	1,142	9	0.8	1,016,053	19,305	1.9
2037	74,929	814	1.1	1,145	2	0.2	1,029,227	13,174	1.3
2038	75,742	813	1.1	1,151	6	0.5	1,045,885	16,659	1.6
2039	76,538	796	1.1	1,158	7	0.6	1,063,192	17,306	1.7
2040	77,330	792	1.0	1,169	11	0.9	1,084,373	21,182	2.0
2041	78,118	788	1.0	1,172	4	0.3	1,098,960	14,587	1.3
2042	78,887	769	1.0	1,181	9	0.7	1,118,017	19,057	1.7
2043	79,608	721	0.9	1,190	9	0.8	1,137,207	19,189	1.7
2044	80,314	706	0.9	1,204	14	1.1	1,160,431	23,224	2.0

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	2,338	40	1.7	92	-14	-13.5	214,493	-29,331	-12.0
2015	2,361	23	1.0	101	10	10.4	239,044	24,551	11.4
2016	2,390	29	1.2	100	-1	-1.3	238,718	-326	-0.1
2017	2,462	72	3.0	97	-3	-3.1	238,286	-433	-0.2
2018	2,485	23	0.9	99	3	2.8	247,241	8,955	3.8
2019	2,516	31	1.2	97	-2	-2.4	244,223	-3,018	-1.2
2020	2,547	31	1.2	90	-7	-7.5	228,741	-15,482	-6.3
2021	2,610	63	2.5	83	-7	-7.8	216,118	-12,623	-5.5
2022	2,651	41	1.6	79	-4	-4.4	209,918	-6,200	-2.9
2023	2,686	35	1.3	77	-2	-3.0	206,263	-3,656	-1.7
2024	2,729	43	1.6	77	0	0.3	210,137	3,874	1.9
2025	2,779	50	1.8	76	-1	-1.3	211,210	1,073	0.5
2026	2,824	45	1.6	75	-1	-0.9	212,622	1,412	0.7
2027	2,869	45	1.6	74	-1	-1.5	212,876	254	0.1
2028	2,913	44	1.5	73	-1	-1.0	213,872	996	0.5
2029	2,955	42	1.4	72	-1	-1.5	213,726	-146	-0.1
2030	2,999	44	1.5	71	-1	-1.4	213,801	74	0.0
2031	3,043	44	1.5	70	-1	-1.3	214,097	296	0.1
2032	3,086	43	1.4	70	-1	-1.0	214,895	798	0.4
2033	3,130	44	1.4	69	-1	-1.5	214,723	-172	-0.1
2034	3,173	43	1.4	68	-1	-1.1	215,194	471	0.2
2035	3,215	42	1.3	67	-1	-1.0	215,917	723	0.3
2036	3,256	41	1.3	67	0	-0.6	217,365	1,449	0.7
2037	3,297	41	1.3	66	-1	-1.0	217,882	517	0.2
2038	3,338	41	1.2	66	0	-0.7	219,118	1,236	0.6
2039	3,378	40	1.2	65	0	-0.7	220,289	1,171	0.5
2040	3,418	40	1.2	65	0	-0.5	221,690	1,401	0.6
2041	3,457	39	1.1	64	-1	-1.0	221,995	304	0.1
2042	3,496	39	1.1	64	0	-0.7	222,984	989	0.4
2043	3,532	36	1.0	63	0	-0.6	223,931	947	0.4
2044	3,568	36	1.0	63	0	-0.3	225,565	1,633	0.7

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Owen Electric had 37 consumers in this class and consumers are projected to increase to 52 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	25	2	8.7	50,934	-2,085	-3.9	1,273,355	53,912	4.4
2015	17	-8	-32.0	63,274	12,340	24.2	1,075,655	-197,700	-15.5
2016	22	5	29.4	53,490	-9,784	-15.5	1,176,771	101,116	9.4
2017	22	0	0.0	56,935	3,445	6.4	1,252,562	75,791	6.4
2018	24	2	9.1	53,937	-2,998	-5.3	1,294,479	41,917	3.3
2019	27	3	12.5	48,325	-5,611	-10.4	1,304,782	10,303	0.8
2020	29	2	7.4	43,698	-4,627	-9.6	1,267,252	-37,529	-2.9
2021	35	6	20.7	37,051	-6,647	-15.2	1,296,802	29,550	2.3
2022	38	3	8.6	38,933	1,882	5.1	1,479,459	182,656	14.1
2023	39	1	2.6	45,795	6,862	17.6	1,786,020	306,561	20.7
2024	39	0	0.2	48,647	2,851	6.2	1,901,281	115,261	6.5
2025	40	1	2.3	51,915	3,268	6.7	2,076,590	175,309	9.2
2026	40	0	0.0	55,719	3,804	7.3	2,228,763	152,173	7.3
2027	41	1	2.5	54,984	-736	-1.3	2,254,326	25,563	1.1
2028	42	1	2.4	54,020	-963	-1.8	2,268,853	14,527	0.6
2029	43	1	2.4	52,854	-1,166	-2.2	2,272,722	3,869	0.2
2030	43	0	0.0	52,854	0	0.0	2,272,722	0	0.0
2031	44	1	2.3	51,862	-992	-1.9	2,281,920	9,198	0.4
2032	45	1	2.3	51,032	-830	-1.6	2,296,447	14,527	0.6
2033	46	1	2.2	50,007	-1,025	-2.0	2,300,316	3,869	0.2
2034	47	1	2.2	49,139	-868	-1.7	2,309,514	9,198	0.4
2035	47	0	0.0	49,139	0	0.0	2,309,514	0	0.0
2036	48	1	2.1	48,418	-721	-1.5	2,324,041	14,527	0.6
2037	49	1	2.1	47,508	-909	-1.9	2,327,910	3,869	0.2
2038	50	1	2.0	46,742	-766	-1.6	2,337,108	9,198	0.4
2039	50	0	0.0	46,742	0	0.0	2,337,108	0	0.0
2040	51	1	2.0	46,110	-632	-1.4	2,351,635	14,527	0.6
2041	52	1	2.0	45,298	-812	-1.8	2,355,504	3,869	0.2
2042	53	1	1.9	44,617	-681	-1.5	2,364,702	9,198	0.4
2043	54	1	1.9	43,961	-656	-1.5	2,373,900	9,198	0.4
2044	54	0	0.0	44,060	99	0.2	2,379,229	5,329	0.2

Methodology and Results *(continued)*

Public Building Forecast

Owen Electric reports a Public Buildings class. Sales are projected using two equations, a customer equation and a sales equation, similar to the residential forecasts. Projections are reported in Table 1-8.

Table 1-8

Public Buildings Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	264	0	0.0	8,267	414	5.3	26,190	1,310	5.3
2015	263	-1	-0.4	8,210	-57	-0.7	25,911	-280	-1.1
2016	261	-2	-0.8	7,904	-306	-3.7	24,756	-1,154	-4.5
2017	264	3	1.1	7,702	-202	-2.6	24,401	-355	-1.4
2018	264	0	0.0	8,403	701	9.1	26,622	2,221	9.1
2019	261	-3	-1.1	8,411	8	0.1	26,345	-278	-1.0
2020	259	-2	-0.8	7,376	-1,036	-12.3	22,923	-3,421	-13.0
2021	259	0	0.0	8,134	759	10.3	25,281	2,358	10.3
2022	258	-1	-0.4	8,090	-44	-0.5	25,046	-235	-0.9
2023	256	-2	-0.8	8,144	54	0.7	25,017	-29	-0.1
2024	256	0	0.0	8,031	-113	-1.4	24,670	-347	-1.4
2025	261	5	2.0	8,031	0	0.0	25,152	482	2.0
2026	261	0	0.0	8,031	0	0.0	25,152	0	0.0
2027	261	0	0.0	8,031	0	0.0	25,152	0	0.0
2028	261	0	0.0	8,031	0	0.0	25,152	0	0.0
2029	262	1	0.4	8,031	0	0.0	25,248	96	0.4
2030	262	0	0.0	8,031	0	0.0	25,248	0	0.0
2031	262	0	0.0	8,031	0	0.0	25,248	0	0.0
2032	262	0	0.0	8,031	0	0.0	25,248	0	0.0
2033	263	1	0.4	8,031	0	0.0	25,345	96	0.4
2034	263	0	0.0	8,031	0	0.0	25,345	0	0.0
2035	263	0	0.0	8,031	0	0.0	25,345	0	0.0
2036	263	0	0.0	8,031	0	0.0	25,345	0	0.0
2037	264	1	0.4	8,031	0	0.0	25,441	96	0.4
2038	264	0	0.0	8,031	0	0.0	25,441	0	0.0
2039	264	0	0.0	8,031	0	0.0	25,441	0	0.0
2040	264	0	0.0	8,031	0	0.0	25,441	0	0.0
2041	265	1	0.4	8,031	0	0.0	25,537	96	0.4
2042	265	0	0.0	8,031	0	0.0	25,537	0	0.0
2043	265	0	0.0	8,031	0	0.0	25,537	0	0.0
2044	265	0	0.0	8,031	0	0.0	25,537	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Owen Electric serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-9.

Table 1-9

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	15	0	0.0	4,340	-493	-10.2	781	-89	-10.2
2015	15	0	0.0	3,835	-504	-11.6	690	-91	-11.6
2016	15	0	0.0	5,851	2,016	52.6	1,053	363	52.6
2017	14	-1	-6.7	5,486	-365	-6.2	922	-131	-12.5
2018	14	0	0.0	5,319	-168	-3.1	894	-28	-3.1
2019	15	1	7.1	4,843	-476	-8.9	872	-22	-2.4
2020	15	0	0.0	4,975	132	2.7	896	24	2.7
2021	15	0	0.0	2,671	-2,304	-46.3	481	-415	-46.3
2022	15	0	0.0	2,224	-447	-16.7	400	-81	-16.7
2023	16	1	6.7	2,100	-123	-5.6	403	3	0.7
2024	15	-1	-6.3	2,158	57	2.7	388	-15	-3.7
2025	15	0	0.0	2,158	0	0.0	388	0	0.0
2026	15	0	0.0	2,158	0	0.0	388	0	0.0
2027	15	0	0.0	2,158	0	0.0	388	0	0.0
2028	15	0	0.0	2,158	0	0.0	388	0	0.0
2029	15	0	0.0	2,158	0	0.0	388	0	0.0
2030	15	0	0.0	2,158	0	0.0	388	0	0.0
2031	15	0	0.0	2,158	0	0.0	388	0	0.0
2032	15	0	0.0	2,158	0	0.0	388	0	0.0
2033	15	0	0.0	2,158	0	0.0	388	0	0.0
2034	15	0	0.0	2,158	0	0.0	388	0	0.0
2035	15	0	0.0	2,158	0	0.0	388	0	0.0
2036	15	0	0.0	2,158	0	0.0	388	0	0.0
2037	15	0	0.0	2,158	0	0.0	388	0	0.0
2038	15	0	0.0	2,158	0	0.0	388	0	0.0
2039	15	0	0.0	2,158	0	0.0	388	0	0.0
2040	15	0	0.0	2,158	0	0.0	388	0	0.0
2041	15	0	0.0	2,158	0	0.0	388	0	0.0
2042	15	0	0.0	2,158	0	0.0	388	0	0.0
2043	15	0	0.0	2,158	0	0.0	388	0	0.0
2044	15	0	0.0	2,158	0	0.0	388	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Owen Electric's peak demands.

Table 1-10 reports the impact of extreme temperature on system demands.

Table 1-10: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal	Extreme		
Degrees	-2	-7	-11	-14
Occurs Once in …	2 Years	5 Years	10 Years	30 Years

Non-Coincident Winter Peak Demand - MW				
Season	Normal	Extreme		
2024 - 25	689	697	704	709
2025 - 26	692	700	707	712
2026 - 27	695	703	710	715
2027 - 28	699	708	715	720
2028 - 29	702	711	718	723
2029 - 30	704	713	720	726
2030 - 31	708	717	724	730
2031 - 32	713	722	729	734
2032 - 33	715	725	732	738
2033 - 34	719	729	736	742
2034 - 35	722	731	739	745
2035 - 36	727	736	744	750
2036 - 37	730	740	748	753
2037 - 38	734	744	752	758
2038 - 39	737	747	755	761
2039 - 40	742	752	760	766
2040 - 41	746	756	764	770
2041 - 42	750	761	769	775
2042 - 43	755	765	774	780
2043 - 44	759	769	778	784

Summer Peak Day Maximum Temperatures				
	Normal		Extreme	
Degrees	96	99	100	102
Occurs Once in …	2 Years	5 Years	10 Years	30 Years

Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	561	574	578	587
2025	650	663	668	677
2026	652	666	670	679
2027	656	669	674	683
2028	659	673	678	687
2029	662	676	681	690
2030	664	678	683	693
2031	668	682	687	697
2032	672	686	691	701
2033	675	690	695	704
2034	679	694	699	709
2035	681	696	701	711
2036	686	701	706	716
2037	690	705	710	720
2038	694	709	715	725
2039	697	712	718	728
2040	701	717	723	733
2041	706	721	727	738
2042	710	726	732	743
2023	715	715	715	715
2044	718	718	718	718

Clark Energy Cooperative

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

CLARK ENERGY
A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Clark Energy Cooperative (Clark Energy), located in Winchester, Kentucky, is an electric distribution cooperative that serves members in 11 counties. This load forecast report contains Clark Energy's long-range forecast of energy and seasonal peak demand.

Clark Energy and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Clark Energy for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Clark Energy. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Clark Energy. Cooperation helps to ensure that the forecast meets both parties' needs. Clark Energy uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Clark Energy is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street and Highway Lighting (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2012	310,184	85,944	11,408	798	408,334	731	5.5	432,965
2013	323,690	87,449	10,334	787	422,260	781	5.0	445,102
2014	342,442	90,389	10,193	788	443,812	793	4.9	467,525
2015	329,443	89,497	10,045	773	429,757	730	5.4	455,030
2016	319,225	84,365	11,359	713	415,663	735	4.9	437,970
2017	308,868	82,806	10,058	675	402,407	705	5.1	424,674
2018	349,630	86,939	11,841	641	449,051	667	5.2	474,186
2019	334,702	83,694	10,498	668	429,562	660	4.6	451,191
2020	324,409	80,778	8,849	687	414,722	600	4.5	434,796
2021	340,440	85,807	9,647	606	436,500	580	5.2	461,267
2022	337,125	85,703	11,138	579	434,545	573	4.5	455,717
2023	317,088	86,178	10,429	561	414,255	518	4.7	435,243
2024	341,661	89,394	25,705	580	457,341	586	4.7	480,605
2025	349,518	90,192	31,105	580	471,396	586	4.7	495,356
2026	353,665	90,114	31,105	580	475,464	586	4.7	499,626
2027	356,001	89,644	31,105	580	477,330	586	4.7	501,585
2028	358,912	89,567	31,105	580	480,165	586	4.7	504,559
2029	359,343	89,082	31,105	580	480,111	586	4.7	504,503
2030	361,099	88,626	31,105	580	481,410	586	4.7	505,867
2031	362,676	88,191	31,105	580	482,553	586	4.7	507,065
2032	365,471	88,028	31,105	580	485,185	586	4.7	509,828
2033	365,899	87,418	31,105	580	485,003	586	4.7	509,637
2034	367,642	87,106	31,105	580	486,434	586	4.7	511,139
2035	370,012	86,859	31,105	580	488,556	586	4.7	513,366
2036	373,797	86,920	31,105	580	492,403	586	4.7	517,404
2037	375,278	86,602	31,105	580	493,566	586	4.7	518,624
2038	377,996	86,587	31,105	580	496,268	586	4.7	521,461
2039	381,069	86,559	31,105	580	499,314	586	4.7	524,657
2040	385,551	86,590	31,105	580	503,827	586	4.7	529,393
2041	387,257	86,182	31,105	580	505,124	586	4.7	530,755
2042	390,602	86,057	31,105	580	508,345	586	4.7	534,135
2043	394,223	86,022	31,105	580	511,931	586	4.7	537,898
2044	399,287	86,265	31,105	580	517,237	586	4.7	543,468

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2011 - 12	107.1	2012	99.0	2012	432,965	46.0%	15° F	103° F
2012 - 13	120.5	2013	89.7	2013	445,102	42.2%	10° F	93° F
2013 - 14	154.2	2014	88.1	2014	467,525	34.6%	0° F	91° F
2014 - 15	158.3	2015	89.8	2015	455,030	32.8%	-18° F	91° F
2015- 16	121.6	2016	93.1	2016	437,970	41.0%	4° F	95° F
2016 - 17	117.4	2017	90.0	2017	424,674	41.3%	4° F	94° F
2017 - 18	144.3	2018	94.3	2018	474,186	37.5%	-3° F	97° F
2018 - 19	135.4	2019	93.6	2019	451,191	38.0%	2° F	97° F
2019 - 20	112.4	2020	94.1	2020	434,796	44.0%	16° F	92° F
2020 - 21	129.5	2021	93.0	2021	461,267	40.7%	2° F	91° F
2021 - 22	134.6	2022	96.0	2022	455,717	38.7%	3° F	98° F
2022 - 23	169.7	2023	93.3	2023	435,243	29.3%	-5° F	94° F
2023 - 24	156.1	2024	98.3	2024	480,605	35.1%	-7° F	
2024 - 25	153.4	2025	99.3	2025	495,356	36.9%		
2025 - 26	154.6	2026	100.0	2026	499,626	36.9%		
2026 - 27	155.1	2027	100.2	2027	501,585	36.9%		
2027 - 28	156.0	2028	100.6	2028	504,559	36.8%		
2028 - 29	155.7	2029	100.6	2029	504,503	37.0%		
2029 - 30	155.9	2030	100.7	2030	505,867	37.0%		
2030 - 31	156.0	2031	100.8	2031	507,065	37.1%		
2031 - 32	156.7	2032	101.1	2032	509,828	37.2%		
2032 - 33	156.3	2033	101.1	2033	509,637	37.2%		
2033 - 34	156.4	2034	101.2	2034	511,139	37.3%		
2034 - 35	156.8	2035	101.5	2035	513,366	37.4%		
2035 - 36	157.7	2036	102.0	2036	517,404	37.5%		
2036 - 37	157.7	2037	102.3	2037	518,624	37.5%		
2037 - 38	158.2	2038	102.7	2038	521,461	37.6%		
2038 - 39	158.8	2039	103.2	2039	524,657	37.7%		
2039 - 40	159.8	2040	103.9	2040	529,393	37.8%		
2040 - 41	159.9	2041	104.2	2041	530,755	37.9%		
2041 - 42	160.5	2042	104.8	2042	534,135	38.0%		
2042 - 43	161.2	2043	105.4	2043	537,898	38.1%		
2043 - 44	162.4	2044	106.2	2044	543,468	38.2%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 0.6 percent a year for the period 2024-2044, compared to a 0.9 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.3 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 0.4 percent.

- Load factor increases from 36.9% to 38.2% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street and Highway Lighting	Total Sales
5-Year	2018 - 2023	-1.9%	-0.2%	-2.5%	-2.6%	-1.6%
	2024 - 2029	1.0%	-0.1%	3.9%	0.0%	1.0%
10-Year	2013 - 2023	-0.2%	-0.1%	0.1%	-3.3%	-0.2%
	2024 - 2034	0.7%	-0.3%	1.9%	0.0%	0.6%
15-Year	2008 - 2023	-0.4%	-0.2%	-1.8%	-0.9%	-0.4%
	2024 - 2039	0.7%	-0.2%	1.3%	0.0%	0.6%
20-Year	2003 - 2023	0.3%	0.0%	1.1%	0.2%	0.3%
	2024 - 2044	0.8%	-0.2%	1.0%	0.0%	0.6%

Growth rates shown are Compound Annual Growth Rates.

Narrative

Clark Energy provides electric service within areas of central and east central Kentucky. The service area extends east from the Lexington metropolitan and Bluegrass regions, west of the corporate headquarters location in Winchester, to the foothill areas adjacent to the mountainous regions of Eastern Kentucky.

The average household in Clark Energy's territory has 2.1 people; 84 percent of all homes are headed by someone age 55 or greater.

Clark Energy predominantly serves members within the counties of Bath, Bourbon, Clark, Madison, Menifee, Montgomery, and Powell. Portions of the counties of Estill, Fayette, Morgan, and Rowan are also served by Clark Energy. See Figure 1-1.

No corporate annexations, mergers, or legislation pertaining to certification of territory possibly altering the complexion of the service area is anticipated.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

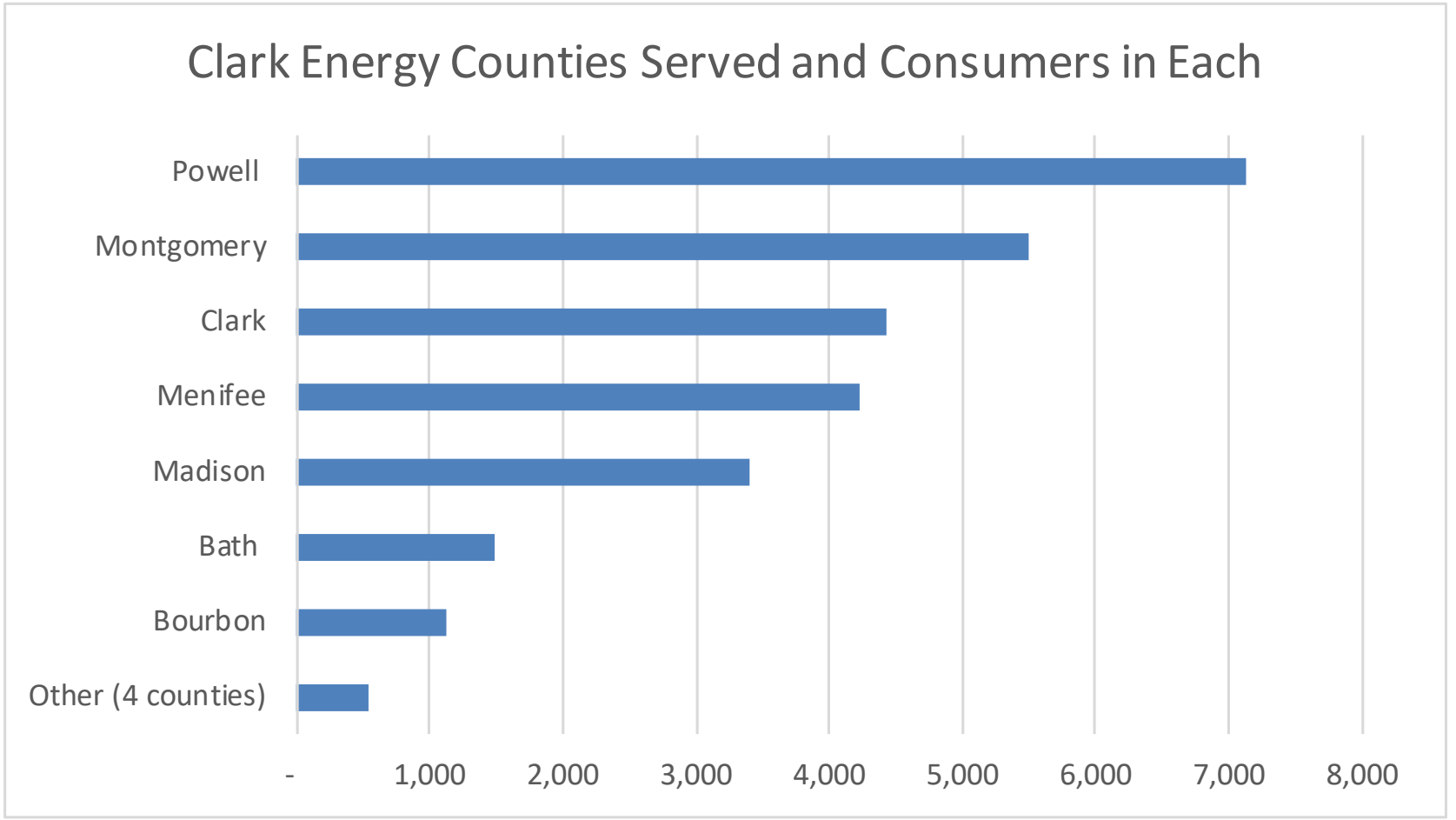
Narrative *(continued)*

The potential for continued economic development within Clark Energy's service area exists due to a variety of factors. Access to major surface transportation systems contributes to development throughout the Lexington metropolitan region. Convenient transportation for goods and services is available throughout a majority of the service area. Major surface transportation within the area consists of two major interstate highways and a major state parkway.

Established industrial parks provide attractive facilities for additional commercial activity. The existence of two state parks along with other recreational resources affords some opportunities for possible future development. Economic development within the eastern counties of Bath, Menifee, and Rowan consists primarily of commercial timber and agricultural operations. The western and southwestern counties close to or part of the metropolitan Lexington area offer the greatest potential for economic growth.

Narrative *(continued)*

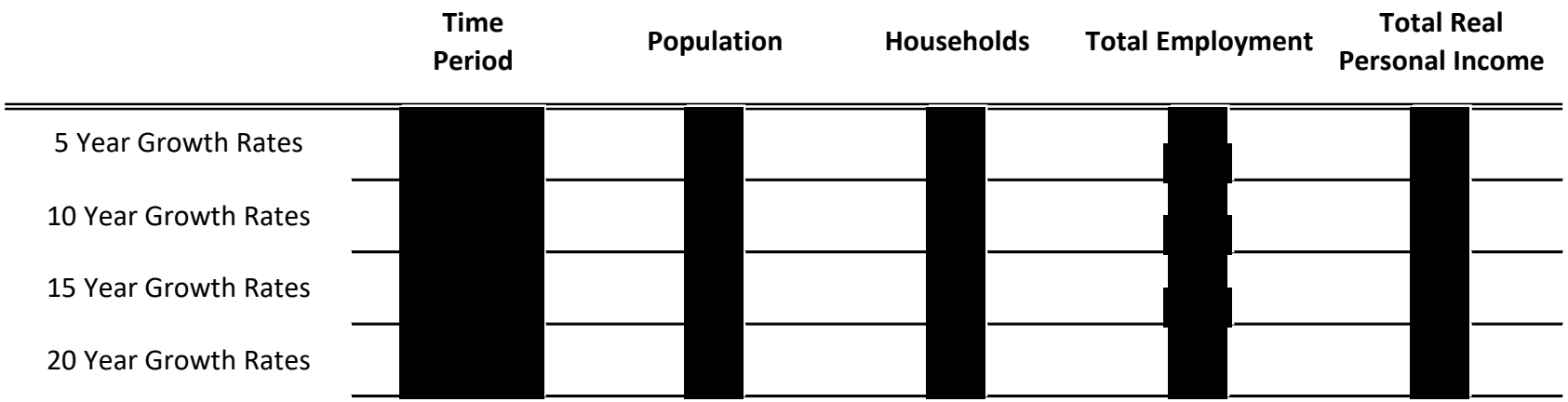
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 57% of consumers use electricity as a primary fuel for heating, while 17% use it as a secondary fuel.
  - 18% use electric furnaces and 35% use electric heat pumps.
- 96% of consumers use electricity for cooling
  - Of those with electric cooling, 78% use central air and 22% use electric window units.
- 85% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the LEX weather station at Blue Grass Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Clark Energy as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Clark Energy experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4 Clark Energy Cooperative Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Peak Billing Demand (MW)	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	467,524,538	5.0%	443,812,064	5.1%	22,919,028	4.9%	106.8	50.0%	25,989	3,066	8.5	$34,837,234	7.5
2015	455,030,406	-2.7%	429,757,200	-3.2%	24,543,592	5.4%	154.0	33.7%	26,085	3,085	8.5	$32,469,589	7.1
2016	437,970,055	-3.7%	415,662,500	-3.3%	21,572,359	4.9%	114.8	43.4%	26,246	3,103	8.5	$30,622,829	7.0
2017	424,674,303	-3.0%	402,407,233	-3.2%	21,562,202	5.1%	113.6	42.7%	26,400	2,908	9.1	$29,843,078	7.0
2018	474,186,048	11.7%	449,051,086	11.6%	24,468,337	5.2%	139.5	38.8%	26,527	2,919	9.1	$32,553,228	6.9
2019	451,191,177	-4.8%	429,562,281	-4.3%	20,968,848	4.6%	128.7	40.0%	26,841	2,936	9.1	$31,106,651	6.9
2020	434,796,200	-3.6%	414,722,051	-3.5%	19,474,631	4.5%	108.7	45.5%	27,016	2,954	9.1	$28,617,420	6.6
2021	461,266,818	6.1%	436,500,152	5.3%	24,186,608	5.2%	117.1	45.0%	27,396	2,965	9.2	$32,639,001	7.1
2022	455,716,970	-1.2%	434,544,940	-0.4%	20,598,964	4.5%	125.5	41.5%	27,598	2,977	9.3	$40,659,461	8.9
2023	435,243,473	-4.5%	414,255,321	-4.7%	20,470,401	4.7%	167.0	29.8%	27,848	2,989	9.3	$38,740,852	8.9
5 Year Average (2019-2023)						4.7%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Clark Energy staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Clark Energy staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Clark Energy's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Clark Energy's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	24,233	19	0.1	1,178	64	5.7	342,442	18,752	5.8
2015	24,317	84	0.3	1,129	-49	-4.1	329,443	-12,999	-3.8
2016	24,477	160	0.7	1,087	-42	-3.7	319,225	-10,217	-3.1
2017	24,597	120	0.5	1,046	-40	-3.7	308,868	-10,357	-3.2
2018	24,693	96	0.4	1,180	133	12.8	349,630	40,762	13.2
2019	24,986	293	1.2	1,116	-64	-5.4	334,702	-14,928	-4.3
2020	25,126	140	0.6	1,076	-40	-3.6	324,409	-10,293	-3.1
2021	25,489	363	1.4	1,113	37	3.4	340,440	16,031	4.9
2022	25,607	118	0.5	1,097	-16	-1.4	337,125	-3,315	-1.0
2023	25,736	129	0.5	1,027	-70	-6.4	317,088	-20,037	-5.9
2024	25,896	160	0.6	1,099	73	7.1	341,661	24,573	7.7
2025	26,098	202	0.8	1,116	17	1.5	349,518	7,857	2.3
2026	26,271	173	0.7	1,122	6	0.5	353,665	4,147	1.2
2027	26,417	146	0.6	1,123	1	0.1	356,001	2,336	0.7
2028	26,544	127	0.5	1,127	4	0.3	358,912	2,911	0.8
2029	26,677	133	0.5	1,123	-4	-0.4	359,343	431	0.1
2030	26,810	133	0.5	1,122	0	0.0	361,099	1,756	0.5
2031	26,917	107	0.4	1,123	0	0.0	362,676	1,577	0.4
2032	27,025	108	0.4	1,127	4	0.4	365,471	2,795	0.8
2033	27,133	108	0.4	1,124	-3	-0.3	365,899	428	0.1
2034	27,241	108	0.4	1,125	1	0.1	367,642	1,744	0.5
2035	27,350	109	0.4	1,127	3	0.2	370,012	2,369	0.6
2036	27,460	110	0.4	1,134	7	0.6	373,797	3,786	1.0
2037	27,570	110	0.4	1,134	0	0.0	375,278	1,481	0.4
2038	27,680	110	0.4	1,138	4	0.3	377,996	2,719	0.7
2039	27,791	111	0.4	1,143	5	0.4	381,069	3,073	0.8
2040	27,902	111	0.4	1,152	9	0.8	385,551	4,482	1.2
2041	27,986	84	0.3	1,153	2	0.1	387,257	1,707	0.4
2042	28,070	84	0.3	1,160	6	0.6	390,602	3,345	0.9
2043	28,154	84	0.3	1,167	7	0.6	394,223	3,621	0.9
2044	28,238	84	0.3	1,178	11	1.0	399,287	5,064	1.3

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,727	-13	-0.7	52	2	4.0	90,389	2,940	3.4
2015	1,741	14	0.8	51	-1	-1.9	89,497	-892	-1.0
2016	1,742	1	0.1	48	-3	-5.9	84,365	-5,132	-5.7
2017	1,776	34	2.0	47	-1	-2.1	82,806	-1,559	-1.8
2018	1,807	31	1.7	48	1	2.1	86,939	4,133	5.0
2019	1,829	22	1.2	46	-2	-4.2	83,694	-3,245	-3.7
2020	1,844	15	0.8	44	-2	-4.3	80,778	-2,917	-3.5
2021	1,861	17	0.9	46	2	4.5	85,807	5,029	6.2
2022	1,943	82	4.4	44	-2	-4.3	85,703	-104	-0.1
2023	2,064	121	6.2	42	-2	-4.5	86,178	475	0.6
2024	2,114	50	2.4	42	0	0.0	89,394	3,216	3.7
2025	2,154	40	1.9	42	0	0.0	90,192	798	0.9
2026	2,189	35	1.6	41	-1	-2.4	90,114	-78	-0.1
2027	2,218	29	1.3	40	-1	-2.4	89,644	-470	-0.5
2028	2,244	26	1.2	40	0	0.0	89,567	-77	-0.1
2029	2,267	23	1.0	39	-1	-2.5	89,082	-485	-0.5
2030	2,287	20	0.9	39	0	0.0	88,626	-456	-0.5
2031	2,305	18	0.8	38	-1	-2.6	88,191	-435	-0.5
2032	2,320	15	0.7	38	0	0.0	88,028	-163	-0.2
2033	2,336	16	0.7	37	-1	-2.6	87,418	-610	-0.7
2034	2,351	15	0.6	37	0	0.0	87,106	-312	-0.4
2035	2,366	15	0.6	37	0	0.0	86,859	-247	-0.3
2036	2,382	16	0.7	36	-1	-2.7	86,920	61	0.1
2037	2,399	17	0.7	36	0	0.0	86,602	-318	-0.4
2038	2,416	17	0.7	36	0	0.0	86,587	-16	0.0
2039	2,433	17	0.7	36	0	0.0	86,559	-27	0.0
2040	2,449	16	0.7	35	-1	-2.8	86,590	31	0.0
2041	2,463	14	0.6	35	0	0.0	86,182	-409	-0.5
2042	2,474	11	0.4	35	0	0.0	86,057	-124	-0.1
2043	2,484	10	0.4	35	0	0.0	86,022	-35	0.0
2044	2,493	9	0.4	35	0	0.0	86,265	243	0.3

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Clark Energy had 1 consumer in this class and consumers are projected to increase to 3 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1	0	0.0	10,193	-140	-1.4	10,193	-140	-1.4
2015	1	0	0.0	10,045	-148	-1.5	10,045	-148	-1.5
2016	1	0	0.0	11,359	1,314	13.1	11,359	1,314	13.1
2017	1	0	0.0	10,058	-1,301	-11.5	10,058	-1,301	-11.5
2018	1	0	0.0	11,841	1,783	17.7	11,841	1,783	17.7
2019	1	0	0.0	10,498	-1,343	-11.3	10,498	-1,343	-11.3
2020	1	0	0.0	8,849	-1,649	-15.7	8,849	-1,649	-15.7
2021	1	0	0.0	9,647	798	9.0	9,647	798	9.0
2022	1	0	0.0	11,138	1,490	15.4	11,138	1,490	15.4
2023	1	0	0.0	10,429	-709	-6.4	10,429	-709	-6.4
2024	3	2	200.0	8,568	-1,860	-17.8	25,705	15,277	146.5
2025	3	0	0.0	10,368	1,800	21.0	31,105	5,400	21.0
2026	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2027	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2028	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2029	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2030	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2031	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2032	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2033	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2034	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2035	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2036	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2037	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2038	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2039	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2040	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2041	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2042	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2043	3	0	0.0	10,368	0	0.0	31,105	0	0.0
2044	3	0	0.0	10,368	0	0.0	31,105	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Clark Energy serves street light accounts which are classified in the ‘Public Street & Highway Lighting’ category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	28	-2	-6.7	2,344	159	7.3	788	1	0.1
2015	26	-2	-7.1	2,476	132	5.6	773	-15	-1.9
2016	26	0	0.0	2,285	-191	-7.7	713	-60	-7.7
2017	26	0	0.0	2,164	-121	-5.3	675	-38	-5.3
2018	26	0	0.0	2,054	-110	-5.1	641	-34	-5.1
2019	25	-1	-3.8	2,227	173	8.4	668	27	4.2
2020	45	20	80.0	1,271	-955	-42.9	687	19	2.8
2021	45	0	0.0	1,121	-150	-11.8	606	-81	-11.8
2022	47	2	4.4	1,027	-94	-8.4	579	-26	-4.3
2023	47	0	0.0	994	-33	-3.2	561	-18	-3.2
2024	47	0	0.0	1,029	35	3.5	580	20	3.5
2025	47	0	0.0	1,029	0	0.0	580	0	0.0
2026	47	0	0.0	1,029	0	0.0	580	0	0.0
2027	47	0	0.0	1,029	0	0.0	580	0	0.0
2028	47	0	0.0	1,029	0	0.0	580	0	0.0
2029	47	0	0.0	1,029	0	0.0	580	0	0.0
2030	47	0	0.0	1,029	0	0.0	580	0	0.0
2031	47	0	0.0	1,029	0	0.0	580	0	0.0
2032	47	0	0.0	1,029	0	0.0	580	0	0.0
2033	47	0	0.0	1,029	0	0.0	580	0	0.0
2034	47	0	0.0	1,029	0	0.0	580	0	0.0
2035	47	0	0.0	1,029	0	0.0	580	0	0.0
2036	47	0	0.0	1,029	0	0.0	580	0	0.0
2037	47	0	0.0	1,029	0	0.0	580	0	0.0
2038	47	0	0.0	1,029	0	0.0	580	0	0.0
2039	47	0	0.0	1,029	0	0.0	580	0	0.0
2040	47	0	0.0	1,029	0	0.0	580	0	0.0
2041	47	0	0.0	1,029	0	0.0	580	0	0.0
2042	47	0	0.0	1,029	0	0.0	580	0	0.0
2043	47	0	0.0	1,029	0	0.0	580	0	0.0
2044	47	0	0.0	1,029	0	0.0	580	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Clark Energy's peak demands.

Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures

	Normal		**Extreme**	
Degrees	-2	-9	-13	-18
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Winter Peak Demand - MW

Season	Normal		Extreme	
2024 - 25	153	163	168	175
2025 - 26	155	164	170	177
2026 - 27	155	165	170	177
2027 - 28	156	166	171	178
2028 - 29	156	166	171	178
2029 - 30	156	166	171	178
2030 - 31	156	166	172	179
2031 - 32	157	167	172	179
2032 - 33	156	166	172	179
2033 - 34	156	166	172	179
2034 - 35	157	167	173	180
2035 - 36	158	168	173	181
2036 - 37	158	168	173	181
2037 - 38	158	168	174	181
2038 - 39	159	169	175	182
2039 - 40	160	170	176	183
2040 - 41	160	170	176	183
2041 - 42	160	171	176	184
2042 - 43	161	171	177	184
2043 - 44	162	173	178	186

Summer Peak Day Maximum Temperatures

	Normal		**Extreme**	
Degrees	96	99	101	103
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Summer Peak Demand - MW

Year	Normal		Extreme	
2024	98	102	104	106
2025	99	103	105	107
2026	100	103	105	108
2027	100	104	106	108
2028	101	104	106	108
2029	101	104	106	108
2030	101	104	106	109
2031	101	104	106	109
2032	101	104	107	109
2033	101	104	107	109
2034	101	105	107	109
2035	102	105	107	109
2036	102	105	108	110
2037	102	106	108	110
2038	103	106	108	111
2039	103	107	109	111
2040	104	107	110	112
2041	104	108	110	112
2042	105	108	111	113
2043	105	109	111	114
2044	106	110	112	114

Nolin Rural Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

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Introduction

Executive Summary

Nolin Rural Electric Cooperative Corporation (Nolin RECC) located in Elizabethtown, Kentucky, is an electric distribution cooperative that serves members in nine counties. This load forecast report contains Nolin RECC's long-range forecast of energy and seasonal peak demand.

Nolin RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Nolin RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Nolin RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Nolin RECC. Cooperation helps to ensure that the forecast meets both parties' needs. Nolin RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Nolin RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street & Highway Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	506,653	107,017	174,722	1,678	790,070	1,071	3.5	820,106
2015	479,456	105,169	178,029	1,710	764,364	1,035	3.7	795,034
2016	485,604	106,634	175,625	1,495	769,359	1,008	3.6	798,911
2017	465,457	105,023	163,002	1,404	734,887	979	3.2	760,404
2018	511,053	110,944	161,775	1,366	785,138	1,002	4.0	819,131
2019	493,709	110,497	149,682	1,356	755,245	992	3.6	784,861
2020	481,406	102,612	119,826	1,421	705,266	942	4.2	737,153
2021	493,783	106,876	126,858	1,391	728,908	809	3.5	756,010
2022	499,318	107,487	123,697	1,363	731,866	634	4.7	768,245
2023	458,963	105,754	126,327	1,330	692,374	585	3.1	715,004
2024	500,609	107,114	132,384	1,330	741,436	585	3.8	771,186
2025	513,017	109,226	164,080	1,330	787,653	585	3.6	817,978
2026	522,119	110,858	200,428	1,330	834,734	585	3.5	865,485
2027	528,726	111,152	218,824	1,330	860,031	585	3.4	891,056
2028	536,057	111,810	237,220	1,330	886,416	585	3.4	917,757
2029	539,289	111,769	237,220	1,330	889,607	585	3.4	921,074
2030	544,424	111,817	237,220	1,330	894,790	585	3.4	926,463
2031	550,008	111,552	237,220	1,330	900,109	585	3.4	931,992
2032	557,532	111,755	237,220	1,330	907,836	585	3.4	940,026
2033	561,055	111,464	237,220	1,330	911,069	585	3.4	943,387
2034	566,491	111,480	237,220	1,330	916,520	585	3.4	949,054
2035	573,014	111,630	237,220	1,330	923,193	585	3.4	955,991
2036	581,468	112,180	246,418	1,330	941,396	585	3.4	974,916
2037	586,067	112,294	246,418	1,330	946,108	585	3.4	979,815
2038	592,273	112,684	246,418	1,330	952,704	585	3.4	986,672
2039	598,625	113,016	246,418	1,330	959,388	585	3.4	993,621
2040	607,266	113,570	246,418	1,330	968,583	585	3.4	1,003,180
2041	612,268	113,264	246,418	1,330	973,279	585	3.4	1,008,063
2042	619,659	113,388	246,418	1,330	980,794	585	3.4	1,015,875
2043	627,381	113,608	246,418	1,330	988,737	585	3.4	1,024,132
2044	637,448	114,131	246,418	1,330	999,326	585	3.4	1,035,142

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Noncoincident Peak Demand (MW)	Year	Noncoincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	241.1	2014	151.9	2014	820,106	38.8%	4° F	94° F
2014 - 15	259.5	2015	155.8	2015	795,034	35.0%	-6° F	94° F
2015 - 16	199.1	2016	160.2	2016	798,911	45.7%	7° F	95° F
2016 - 17	203.5	2017	158.1	2017	760,404	42.7%	9° F	97° F
2017 - 18	230.0	2018	159.3	2018	819,131	40.7%	0° F	98° F
2018 - 19	205.4	2019	156.7	2019	784,861	43.6%	3° F	98° F
2019 - 20	174.3	2020	152.6	2020	737,153	48.1%	17° F	95° F
2020 - 21	205.6	2021	156.7	2021	756,010	42.0%	10° F	97° F
2021 - 22	200.9	2022	159.2	2022	768,245	43.7%	8° F	101° F
2022 - 23	256.7	2023	157.3	2023	715,004	31.8%	-5° F	99° F
2023 - 24	239.7	2024	162.2	2024	771,186	36.6%	3° F	
2024 - 25	250.0	2025	173.5	2025	817,978	37.4%		
2025 - 26	262.1	2026	177.3	2026	865,485	37.7%		
2026 - 27	265.8	2027	184.7	2027	891,056	38.3%		
2027 - 28	274.3	2028	186.2	2028	917,757	38.2%		
2028 - 29	274.9	2029	187.0	2029	921,074	38.2%		
2029 - 30	276.3	2030	188.1	2030	926,463	38.3%		
2030 - 31	277.8	2031	189.3	2031	931,992	38.3%		
2031 - 32	280.1	2032	190.8	2032	940,026	38.3%		
2032 - 33	280.8	2033	191.7	2033	943,387	38.4%		
2033 - 34	282.3	2034	192.9	2034	949,054	38.4%		
2034 - 35	284.1	2035	194.4	2035	955,991	38.4%		
2035 - 36	288.3	2036	197.7	2036	974,916	38.6%		
2036 - 37	289.2	2037	199.1	2037	979,815	38.7%		
2037 - 38	291.0	2038	200.6	2038	986,672	38.7%		
2038 - 39	292.7	2039	202.1	2039	993,621	38.7%		
2039 - 40	295.3	2040	204.0	2040	1,003,180	38.8%		
2040 - 41	296.3	2041	205.3	2041	1,008,063	38.8%		
2041 - 42	298.2	2042	207.1	2042	1,015,875	38.9%		
2042 - 43	300.2	2043	208.9	2043	1,024,132	38.9%		
2043 - 44	303.2	2044	211.0	2044	1,035,142	39.0%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.5 percent a year for the period 2024-2044, which is the same percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 1.0 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.3 percent.

- Load factor increases from 37.4% to 39.0% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street and Highway Lighting	Total Sales
5-Year	2018-2023	-2.1%	-1.0%	-4.8%	-0.5%	-2.5%
	2024-2029	1.5%	0.9%	12.4%	0.0%	3.7%
10-Year	2013-2023	-0.7%	-0.2%	-3.0%	-2.2%	-1.1%
	2024-2034	1.2%	0.4%	6.0%	0.0%	2.1%
15-Year	2008-2023	-0.3%	-0.4%	-2.0%	-1.1%	-0.7%
	2024-2039	1.2%	0.4%	4.2%	0.0%	1.7%
20-Year	2003-2023	0.6%	-0.3%	-1.2%	-0.2%	0.1%
	2024-2044	1.2%	0.3%	3.2%	0.0%	1.5%

Growth rates shown are Compound Annual Growth Rates.

Narrative

Nolin Rural Electric Cooperative Corporation, Kentucky 51 Hardin, with headquarters in Elizabethtown, Kentucky is located in north central Kentucky. It presently provides service for consumers in nine counties: Breckinridge, Bullitt, Grayson, Green, Hardin, Hart, LaRue, Meade, and Taylor (see Figure 1-1).

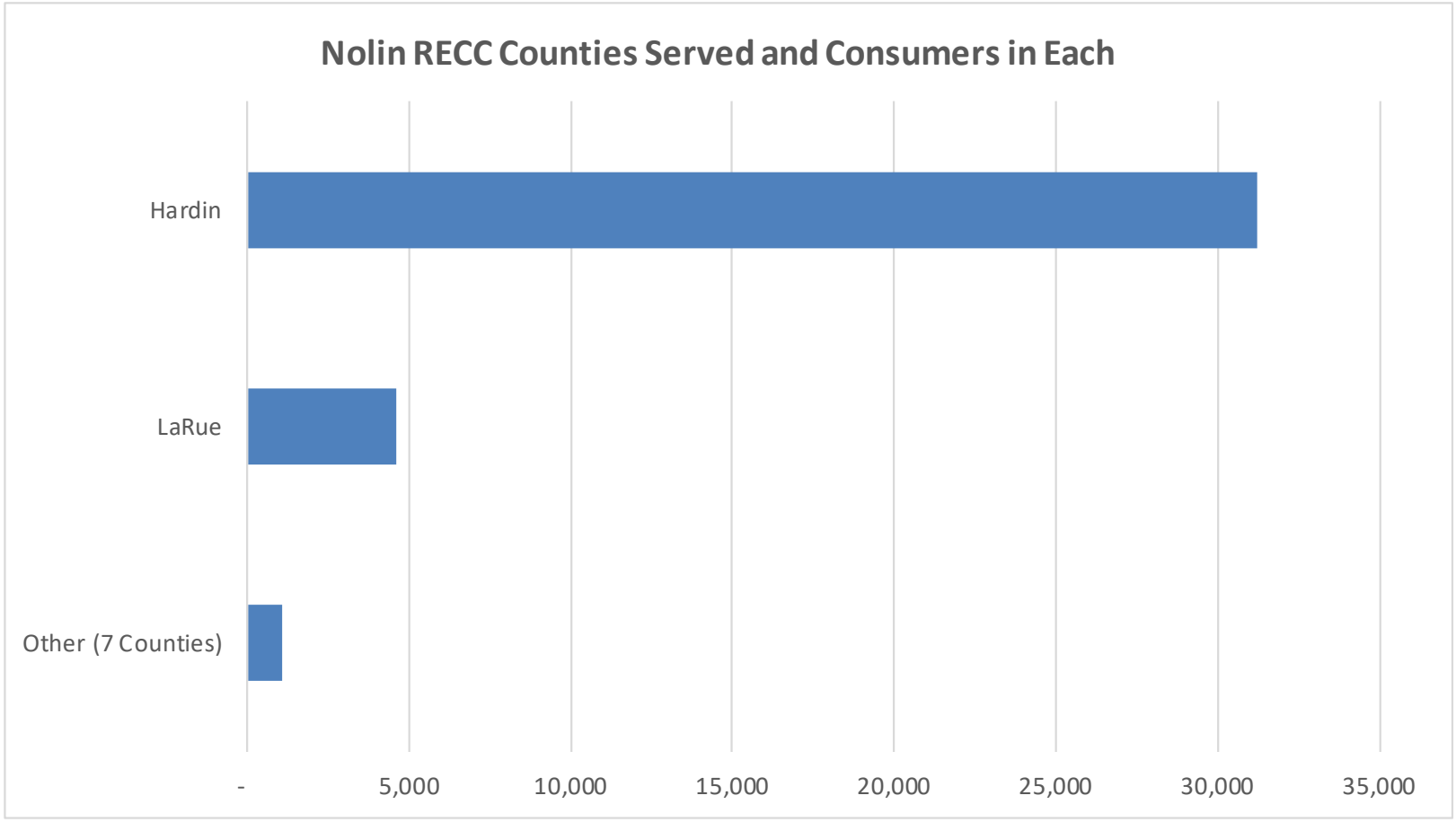
Growth is anticipated for residential, small commercial, and large commercial classes. Nolin RECC serves more consumers in Hardin County than in the other eight counties it serves combined, and Hardin County is well positioned for growth in the coming years.

Suppliers for Blue Oval are locating within Nolin RECC territory, directly driving growth in the large commercial class. Residential and small commercial class growth is also being boosted by Blue Oval.

The south, west and east regions of the system are historically established agricultural areas and are expected to remain primarily agricultural.

Narrative *(continued)*

Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3

	Time Period	Population	Households	Total Employment	Total Real Personal Income
5 Year Growth Rates	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10 Year Growth Rates					
15 Year Growth Rates					
20 Year Growth Rates					

Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 71% of consumers use electricity as a primary fuel for heating, while 18% use it as a secondary fuel.
  - 16% use electric furnaces and 48% use electric heat pumps.
- 98% of consumers use electricity for cooling
  - Of those with electric cooling, 93% use central air and 7% use electric window units.
- 87% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the Louisville Standiford Field (SDF) weather station.
- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form by consumer classification. Table 1-4 reports historical data for Nolin RECC.

A preliminary forecast was prepared during the second quarter of 2024, after Nolin RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Nolin RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	820,106,323	2.8%	790,069,654	2.2%	28,965,248	3.5%	223.3	41.9%	34,314	3,017	11.4	$58,435,007	7.1
2015	795,034,070	-3.1%	764,364,464	-3.3%	29,634,588	3.7%	222.5	40.8%	34,620	3,022	11.5	$53,516,376	6.7
2016	798,910,822	0.5%	769,358,870	0.7%	28,544,298	3.6%	190.9	47.8%	34,892	3,025	11.5	$52,919,789	6.6
2017	760,403,789	-4.8%	734,886,550	-4.5%	24,538,422	3.2%	202.4	42.8%	35,161	3,058	11.5	$50,513,897	6.6
2018	819,131,411	7.7%	785,137,881	6.8%	32,991,343	4.0%	226.1	41.4%	35,440	3,036	11.7	$53,818,893	6.6
2019	784,861,333	-4.2%	755,244,506	-3.8%	28,624,940	3.6%	194.9	46.0%	35,614	2,910	12.2	$51,398,427	6.5
2020	737,153,365	-6.1%	705,265,582	-6.6%	30,946,217	4.2%	169.8	49.5%	35,939	2,970	12.1	$45,339,762	6.2
2021	756,010,163	2.6%	728,908,388	3.4%	26,292,405	3.5%	194.2	44.3%	36,406	2,953	12.3	$52,724,360	7.0
2022	768,244,813	1.6%	731,865,824	0.4%	35,745,420	4.7%	245.9	35.7%	36,794	2,968	12.4	$65,721,695	8.6
2023	715,003,845	-6.9%	692,373,800	-5.4%	22,045,524	3.1%	155.5	52.5%	37,248	2,986	12.5	$59,298,279	8.3
5 Year Average (2019-2023)						3.8%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Nolin RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Nolin RECC staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Nolin RECC's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Nolin RECC's energy forecast.

Table 1-5
Residential Summary

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	32,333	374	1.2	1,306	25	1.9	506,653	15,318	3.1
2015	32,635	302	0.9	1,224	-82	-6.2	479,456	-27,197	-5.4
2016	32,918	283	0.9	1,229	5	0.4	485,604	6,148	1.3
2017	33,140	222	0.7	1,170	-59	-4.8	465,457	-20,148	-4.1
2018	33,414	274	0.8	1,275	104	8.9	511,053	45,596	9.8
2019	33,594	180	0.5	1,225	-50	-3.9	493,709	-17,344	-3.4
2020	33,905	311	0.9	1,183	-41	-3.4	481,406	-12,303	-2.5
2021	34,335	430	1.3	1,198	15	1.3	493,783	12,377	2.6
2022	34,650	315	0.9	1,201	2	0.2	499,318	5,536	1.1
2023	34,928	278	0.8	1,095	-106	-8.8	458,963	-40,355	-8.1
2024	35,759	831	2.4	1,167	72	6.5	500,609	41,646	9.1
2025	36,526	767	2.1	1,170	4	0.3	513,017	12,407	2.5
2026	36,925	399	1.1	1,178	8	0.7	522,119	9,102	1.8
2027	37,279	354	1.0	1,182	4	0.3	528,726	6,607	1.3
2028	37,591	312	0.8	1,188	6	0.5	536,057	7,331	1.4
2029	37,881	290	0.8	1,186	-2	-0.2	539,289	3,232	0.6
2030	38,175	294	0.8	1,188	2	0.2	544,424	5,136	1.0
2031	38,475	300	0.8	1,191	3	0.2	550,008	5,584	1.0
2032	38,769	294	0.8	1,198	7	0.6	557,532	7,524	1.4
2033	39,056	287	0.7	1,197	-1	-0.1	561,055	3,523	0.6
2034	39,349	293	0.8	1,200	3	0.2	566,491	5,435	1.0
2035	39,622	273	0.7	1,205	5	0.5	573,014	6,523	1.2
2036	39,887	265	0.7	1,215	10	0.8	581,468	8,455	1.5
2037	40,136	249	0.6	1,217	2	0.2	586,067	4,599	0.8
2038	40,381	245	0.6	1,222	5	0.4	592,273	6,206	1.1
2039	40,612	231	0.6	1,228	6	0.5	598,625	6,352	1.1
2040	40,845	233	0.6	1,239	11	0.9	607,266	8,641	1.4
2041	41,075	230	0.6	1,242	3	0.3	612,268	5,002	0.8
2042	41,292	217	0.5	1,251	8	0.7	619,659	7,390	1.2
2043	41,510	218	0.5	1,259	9	0.7	627,381	7,723	1.2
2044	41,731	221	0.5	1,273	13	1.1	637,448	10,067	1.6

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,944	-19	-1.0	55	0	-0.3	107,017	-1,320	-1.2
2015	1,948	4	0.2	54	-1	-1.9	105,169	-1,847	-1.7
2016	1,938	-10	-0.5	55	1	1.9	106,634	1,465	1.4
2017	1,987	49	2.5	53	-2	-3.9	105,023	-1,611	-1.5
2018	1,992	5	0.3	56	3	5.4	110,944	5,921	5.6
2019	1,986	-6	-0.3	56	0	-0.1	110,497	-447	-0.4
2020	1,999	13	0.7	51	-4	-7.7	102,612	-7,885	-7.1
2021	2,035	36	1.8	53	1	2.3	106,876	4,264	4.2
2022	2,108	73	3.6	51	-2	-2.9	107,487	611	0.6
2023	2,284	176	8.3	46	-5	-9.2	105,754	-1,733	-1.6
2024	2,410	126	5.5	44	-2	-4.0	107,114	1,360	1.3
2025	2,480	70	2.9	44	0	-0.9	109,226	2,112	2.0
2026	2,529	49	2.0	44	0	-0.5	110,858	1,632	1.5
2027	2,551	22	0.9	44	0	-0.6	111,152	294	0.3
2028	2,570	19	0.7	44	0	-0.2	111,810	658	0.6
2029	2,587	17	0.7	43	0	-0.7	111,769	-41	0.0
2030	2,605	18	0.7	43	0	-0.6	111,817	48	0.0
2031	2,624	19	0.7	43	0	-1.0	111,552	-265	-0.2
2032	2,641	17	0.6	42	0	-0.5	111,755	203	0.2
2033	2,659	18	0.7	42	0	-0.9	111,464	-290	-0.3
2034	2,677	18	0.7	42	0	-0.7	111,480	16	0.0
2035	2,693	16	0.6	41	0	-0.5	111,630	149	0.1
2036	2,709	16	0.6	41	0	-0.1	112,180	551	0.5
2037	2,724	15	0.6	41	0	-0.4	112,294	114	0.1
2038	2,739	15	0.6	41	0	-0.2	112,684	390	0.3
2039	2,753	14	0.5	41	0	-0.2	113,016	332	0.3
2040	2,767	14	0.5	41	0	0.0	113,570	554	0.5
2041	2,781	14	0.5	41	0	-0.8	113,264	-306	-0.3
2042	2,795	14	0.5	41	0	-0.4	113,388	124	0.1
2043	2,808	13	0.5	40	0	-0.3	113,608	220	0.2
2044	2,821	13	0.5	40	0	0.0	114,131	523	0.5

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Nolin RECC had 2 consumers in this class and consumers are projected to increase to 6 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	2	0	0.0	87,361	1,572	1.8	174,722	3,145	1.8
2015	2	0	0.0	89,014	1,653	1.9	178,029	3,307	1.9
2016	2	0	0.0	87,813	-1,202	-1.4	175,625	-2,404	-1.4
2017	2	0	0.0	81,501	-6,311	-7.2	163,002	-12,623	-7.2
2018	2	0	0.0	80,887	-614	-0.8	161,775	-1,228	-0.8
2019	2	0	0.0	74,841	-6,046	-7.5	149,682	-12,092	-7.5
2020	2	0	0.0	59,913	-14,928	-19.9	119,826	-29,856	-19.9
2021	2	0	0.0	63,429	3,516	5.9	126,858	7,032	5.9
2022	2	0	0.0	61,848	-1,581	-2.5	123,697	-3,161	-2.5
2023	2	0	0.0	63,164	1,315	2.1	126,327	2,630	2.1
2024	3	1	50.0	44,128	-19,036	-30.1	132,384	6,057	4.8
2025	5	2	66.7	32,816	-11,312	-25.6	164,080	31,697	23.9
2026	5	0	0.0	40,086	7,269	22.2	200,428	36,347	22.2
2027	5	0	0.0	43,765	3,679	9.2	218,824	18,396	9.2
2028	5	0	0.0	47,444	3,679	8.4	237,220	18,396	8.4
2029	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2030	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2031	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2032	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2033	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2034	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2035	5	0	0.0	47,444	0	0.0	237,220	0	0.0
2036	6	1	20.0	41,070	-6,374	-13.4	246,418	9,198	3.9
2037	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2038	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2039	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2040	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2041	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2042	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2043	6	0	0.0	41,070	0	0.0	246,418	0	0.0
2044	6	0	0.0	41,070	0	0.0	246,418	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Nolin RECC serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	35	1	2.9	3,996	-57	-1.4	1,678	25	1.5
2015	35	0	0.0	4,072	76	1.9	1,710	32	1.9
2016	34	-1	-2.9	3,665	-407	-10.0	1,495	-215	-12.6
2017	32	-2	-5.9	3,657	-8	-0.2	1,404	-91	-6.1
2018	32	0	0.0	3,556	-101	-2.8	1,366	-39	-2.8
2019	32	0	0.0	3,532	-24	-0.7	1,356	-9	-0.7
2020	33	1	3.1	3,589	57	1.6	1,421	65	4.8
2021	34	1	3.0	3,410	-180	-5.0	1,391	-30	-2.1
2022	34	0	0.0	3,341	-69	-2.0	1,363	-28	-2.0
2023	34	0	0.0	3,259	-82	-2.5	1,330	-33	-2.5
2024	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2025	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2026	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2027	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2028	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2029	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2030	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2031	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2032	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2033	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2034	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2035	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2036	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2037	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2038	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2039	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2040	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2041	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2042	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2043	34	0	0.0	3,259	0	0.0	1,330	0	0.0
2044	34	0	0.0	3,259	0	0.0	1,330	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Nolin RECC's peak demands. Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		**Extreme**	
Degrees	0	-8	-14	-23
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	250	260	268	280
2025 - 26	262	273	281	293
2026 - 27	266	277	285	297
2027 - 28	274	285	293	305
2028 - 29	275	286	294	306
2029 - 30	276	287	295	308
2030 - 31	278	289	297	310
2031 - 32	280	291	300	312
2032 - 33	281	292	300	313
2033 - 34	282	294	302	315
2034 - 35	284	295	304	317
2035 - 36	288	300	308	321
2036 - 37	289	301	309	322
2037 - 38	291	303	311	324
2038 - 39	293	304	313	326
2039 - 40	295	307	316	329
2040 - 41	296	308	317	330
2041 - 42	298	310	319	332
2042 - 43	300	312	321	334
2043 - 44	303	315	324	338

Summer Peak Day Maximum Temperatures				
	Normal		**Extreme**	
Degrees	98	100	102	104
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	162	167	173	178
2025	174	179	184	190
2026	177	183	188	194
2027	185	190	196	201
2028	186	192	197	203
2029	187	193	198	204
2030	188	194	199	205
2031	189	195	201	206
2032	191	196	202	208
2033	192	197	203	209
2034	193	199	205	210
2035	194	200	206	212
2036	198	204	210	215
2037	199	205	211	217
2038	201	207	213	219
2039	202	208	214	220
2040	204	210	216	222
2041	205	211	218	224
2042	207	213	219	225
2043	209	215	221	227
2044	211	217	223	230

Fleming-Mason Energy Cooperative

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Fleming-Mason Energy
A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Fleming-Mason Energy Cooperative (Fleming-Mason Energy), located in Flemingsburg, Kentucky, is an electric distribution cooperative that serves members in eight counties. This load forecast report contains Fleming-Mason Energy's long-range forecast of energy and peak demand.

Fleming-Mason Energy and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Fleming-Mason Energy for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Fleming-Mason Energy. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Fleming-Mason Energy. Cooperation helps to ensure that the forecast meets both parties' needs. Fleming-Mason Energy uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of generation planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Fleming-Mason Energy is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street & Highway Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	293,983	119,635	516,461	93	930,172	677	2.9	958,271
2015	282,163	124,464	451,473	94	858,194	577	2.6	881,817
2016	285,696	131,182	565,193	93	982,163	567	2.2	1,004,335
2017	268,823	129,214	579,518	92	977,646	542	2.5	1,003,316
2018	305,220	135,613	528,802	100	969,736	607	2.3	992,751
2019	293,374	131,651	480,640	103	905,769	536	2.5	929,524
2020	288,466	122,649	576,972	102	988,189	516	2.4	1,013,118
2021	296,999	128,599	627,338	101	1,053,037	520	2.1	1,075,652
2022	300,559	129,858	569,911	99	1,000,428	543	2.4	1,026,016
2023	271,595	130,849	598,409	98	1,000,951	430	2.1	1,022,948
2024	291,930	132,513	550,280	98	974,821	509	2.3	998,313
2025	297,737	132,053	550,280	98	980,167	509	2.3	1,003,785
2026	303,229	132,026	550,280	98	985,633	509	2.3	1,009,380
2027	306,857	131,680	550,280	98	988,914	509	2.3	1,012,739
2028	310,878	131,876	559,478	98	1,002,329	509	2.3	1,026,470
2029	312,280	131,498	559,478	98	1,003,353	509	2.3	1,027,518
2030	314,984	131,314	559,478	98	1,005,874	509	2.3	1,030,098
2031	318,350	131,345	559,478	98	1,009,270	509	2.3	1,033,574
2032	322,922	131,944	559,478	98	1,014,442	509	2.3	1,038,868
2033	324,928	131,879	559,478	98	1,016,382	509	2.3	1,040,854
2034	328,025	132,230	559,478	98	1,019,831	509	2.3	1,044,384
2035	331,539	132,611	559,478	98	1,023,725	509	2.3	1,048,370
2036	336,334	133,318	568,676	98	1,038,426	509	2.3	1,063,418
2037	338,901	133,441	568,676	98	1,041,116	509	2.3	1,066,171
2038	342,432	133,927	568,676	98	1,045,132	509	2.3	1,070,281
2039	346,073	134,428	568,676	98	1,049,274	509	2.3	1,074,521
2040	351,065	135,041	568,676	98	1,054,880	509	2.3	1,080,259
2041	353,682	135,075	568,676	98	1,057,530	509	2.3	1,082,972
2042	357,786	135,481	568,676	98	1,062,040	509	2.3	1,087,588
2043	362,049	136,000	568,676	98	1,066,822	509	2.3	1,092,482
2044	367,640	136,879	577,874	98	1,082,490	509	2.3	1,108,519

Table 1-1 *(continued)*

Peaks Summary

	Winter	*Summer*				
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	215.0	2014	152.9	2014	958,271	50.9%	-6° F	91° F
2014 - 15	213.6	2015	137.9	2015	881,817	47.1%	-12° F	91° F
2015- 16	190.0	2016	171.0	2016	1,004,335	60.2%	5° F	92° F
2016 - 17	185.3	2017	163.1	2017	1,003,316	61.8%	6° F	90° F
2017 - 18	212.0	2018	168.1	2018	992,751	53.4%	-7° F	94° F
2018 - 19	190.3	2019	169.6	2019	929,524	55.8%	-7° F	95° F
2019 - 20	183.1	2020	163.0	2020	1,013,118	63.0%	10° F	90° F
2020 - 21	203.6	2021	162.0	2021	1,075,652	60.3%	4° F	91° F
2021 - 22	225.5	2022	172.3	2022	1,026,016	51.9%	3° F	95° F
2022 - 23	244.9	2023	167.0	2023	1,022,948	47.7%	-8° F	94° F
2023 - 24	238.4	2024	172.0	2024	998,313	47.7%	-2° F	
2024 - 25	240.9	2025	172.2	2025	1,003,785	47.6%		
2025 - 26	242.6	2026	173.6	2026	1,009,380	47.5%		
2026 - 27	243.8	2027	174.5	2027	1,012,739	47.4%		
2027 - 28	246.8	2028	177.0	2028	1,026,470	47.4%		
2028 - 29	247.0	2029	177.4	2029	1,027,518	47.5%		
2029 - 30	247.8	2030	178.0	2030	1,030,098	47.5%		
2030 - 31	248.9	2031	178.9	2031	1,033,574	47.4%		
2031 - 32	250.6	2032	180.2	2032	1,038,868	47.2%		
2032 - 33	251.1	2033	180.7	2033	1,040,854	47.3%		
2033 - 34	252.1	2034	181.6	2034	1,044,384	47.3%		
2034 - 35	253.4	2035	182.7	2035	1,048,370	47.2%		
2035 - 36	256.7	2036	185.5	2036	1,063,418	47.2%		
2036 - 37	257.4	2037	186.3	2037	1,066,171	47.3%		
2037 - 38	258.6	2038	187.4	2038	1,070,281	47.2%		
2038 - 39	259.9	2039	188.6	2039	1,074,521	47.2%		
2039 - 40	261.7	2040	190.0	2040	1,080,259	47.1%		
2040 - 41	262.4	2041	190.8	2041	1,082,972	47.1%		
2041 - 42	263.8	2042	192.1	2042	1,087,588	47.1%		
2042 - 43	265.3	2043	193.4	2043	1,092,482	47.0%		
2043 - 44	268.9	2044	196.6	2044	1,108,519	47.1%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 0.5 percent a year for the period 2024-2044, compared to a 0.4 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.6 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 0.7 percent.

- Load factor decreases from 47.6% to 47.1% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street & Highway Lighting Sales	Total Sales
5-Year	2018-2023	-2.3%	-0.7%	2.5%	-0.5%	0.6%
	2024-2029	1.4%	-0.2%	0.3%	0.0%	0.6%
10-Year	2013-2023	-0.5%	1.1%	3.2%	0.7%	1.8%
	2024-2034	1.2%	0.0%	0.2%	0.0%	0.5%
15-Year	2008-2023	-0.2%	0.4%	0.5%	1.6%	0.2%
	2024-2039	1.1%	0.1%	0.2%	0.0%	0.5%
20-Year	2003-2023	0.5%	1.0%	0.7%	1.3%	0.6%
	2024-2044	1.2%	0.2%	0.2%	0.0%	0.5%

Growth rates shown are Compound Annual Growth Rates.

Narrative

The service area of Fleming-Mason Energy is located in the northeastern Kentucky Counties of Bath, Bracken, Fleming, Lewis, Mason, Nicholas, Robertson, and Rowan. The electric service boundaries dividing these counties were established by the Kentucky Public Service Commission several years ago.

The average household has 2.25 people; 75 percent of all homes are headed by someone age 55 or greater.

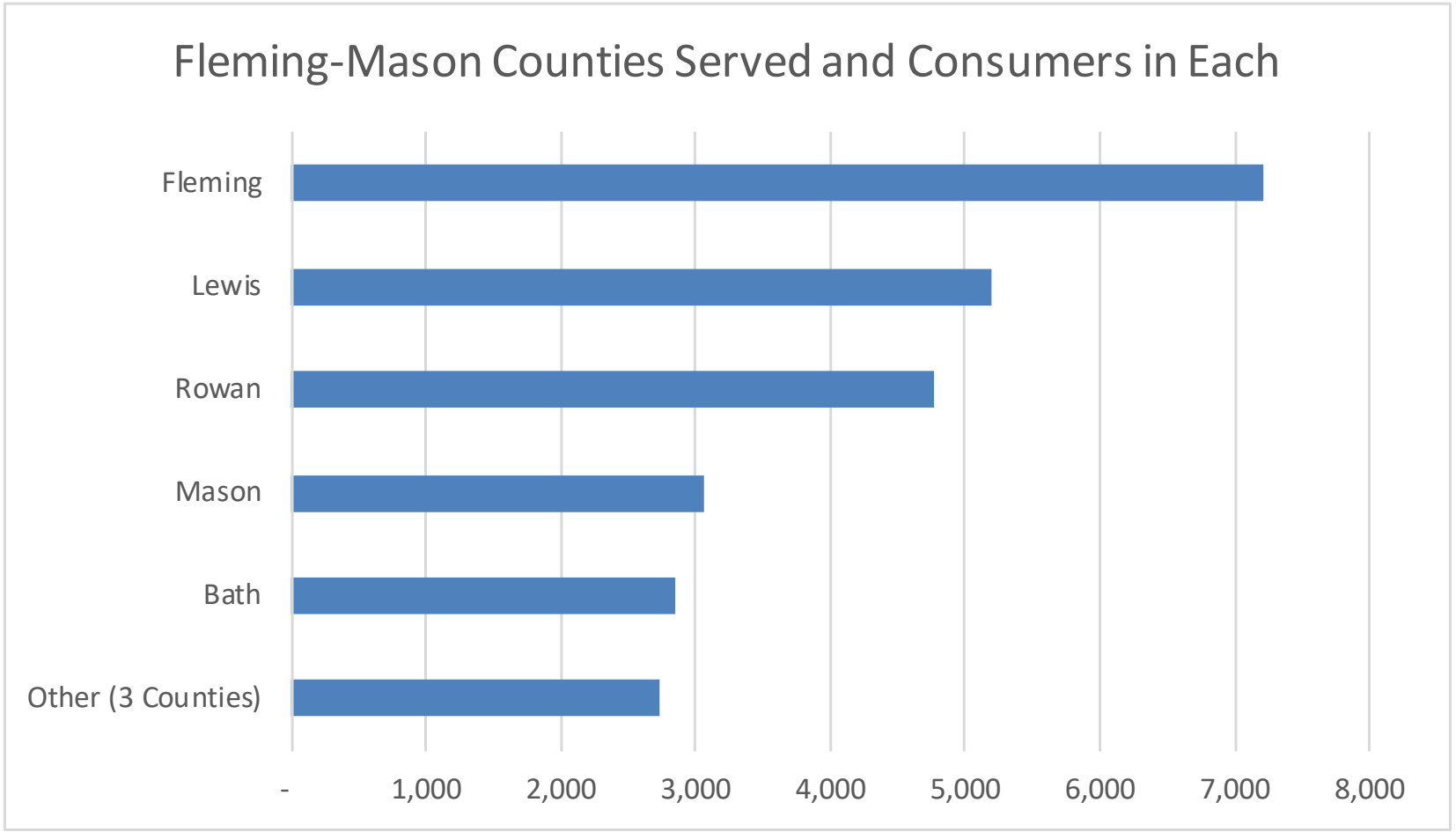
This is a primarily agricultural area with the major interest in tobacco, dairy, and beef cattle. The wooded eastern section has a small sawmill industry. The three largest communities are Maysville (population 8,700), Morehead (population 6,700) and Flemingsburg (population 3,000). All three are primarily in the electrical service territory of Kentucky Utilities, as are the county seat communities of the other counties except Vanceburg in Lewis County, which has a municipal power system.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Community populations are from Annual Estimates of the Resident Population for Incorporated Places in Kentucky: April 1, 2020 to Jul 1, 2023 (SUB-IP-EST2023-POP-21). Source: US Census Bureau, Population Division. Release Date May 2024.

Narrative *(continued)*

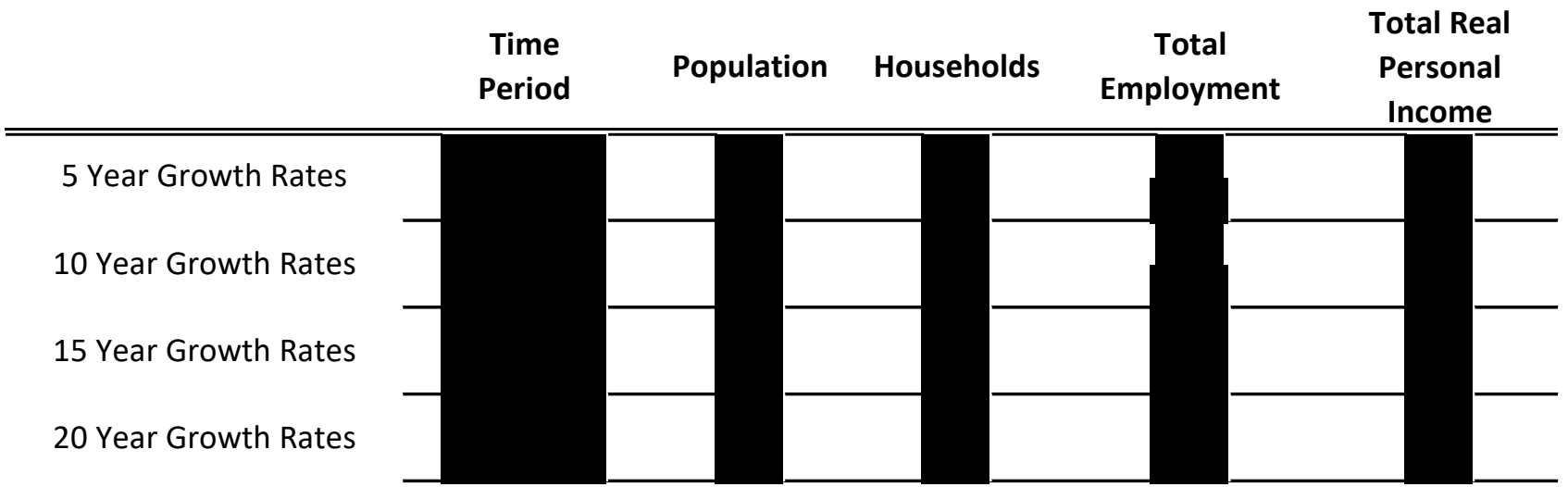
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 58% of consumers use electricity as a primary fuel for heating, while 23% use it as a secondary fuel.
  - 21% use electric furnaces and 32% use electric heat pumps.
- 95% of consumers use electricity for cooling
  - Of those with electric cooling, 84% use central air and 16% use electric window units.
- 92% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*

Weather

- Weather data is from the CVG weather station at Cincinnati/Northern Kentucky Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Fleming-Mason Energy as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Fleming-Mason Energy experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Fleming-Mason Energy Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	958,270,888	11.0%	930,171,811	10.9%	27,422,409	2.9%	187.3	58.4%	23,885	3,582	6.7	$63,006,794	6.6
2015	881,817,460	-8.0%	858,193,889	-7.7%	23,046,094	2.6%	195.9	51.4%	24,010	3,595	6.7	$56,077,535	6.4
2016	1,004,335,325	13.9%	982,163,125	14.4%	21,605,469	2.2%	166.4	68.7%	24,219	3,601	6.7	$58,716,259	5.8
2017	1,003,315,863	-0.1%	977,646,131	-0.5%	25,127,441	2.5%	161.3	71.0%	24,355	3,612	6.7	$58,024,277	5.8
2018	992,750,692	-1.1%	969,735,813	-0.8%	22,407,496	2.3%	187.6	60.4%	24,474	3,624	6.8	$58,519,493	5.9
2019	929,523,735	-6.4%	905,768,533	-6.6%	23,218,713	2.5%	190.2	55.8%	24,611	3,635	6.8	$54,937,878	5.9
2020	1,013,117,635	9.0%	988,189,299	9.1%	24,412,024	2.4%	157.2	73.4%	24,916	3,653	6.8	$52,251,010	5.2
2021	1,075,652,111	6.2%	1,053,036,940	6.6%	22,095,588	2.1%	173.2	70.9%	25,235	3,663	6.9	$63,714,365	5.9
2022	1,026,016,445	-4.6%	1,000,427,867	-5.0%	25,045,573	2.4%	214.1	54.7%	25,475	3,676	6.9	$80,627,507	7.9
2023	1,022,948,173	-0.3%	1,000,950,973	0.1%	21,567,472	2.1%	173.6	67.3%	25,721	3,678	7.0	$74,100,617	7.2
5 Year Average (2019-2023)						2.3%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Fleming-Mason Energy staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Fleming-Mason Energy staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Fleming-Mason Energy's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Fleming-Mason Energy's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	22,196	11	0.0	1,104	32	3.0	293,983	8,575	3.0
2015	22,308	112	0.5	1,054	-50	-4.5	282,163	-11,820	-4.0
2016	22,492	184	0.8	1,059	4	0.4	285,696	3,533	1.3
2017	22,613	121	0.5	991	-68	-6.4	268,823	-16,873	-5.9
2018	22,730	117	0.5	1,119	128	13.0	305,220	36,397	13.5
2019	22,841	111	0.5	1,070	-49	-4.3	293,374	-11,846	-3.9
2020	23,131	290	1.3	1,039	-31	-2.9	288,466	-4,908	-1.7
2021	23,441	310	1.3	1,056	17	1.6	296,999	8,533	3.0
2022	23,417	-24	-0.1	1,070	14	1.3	300,559	3,561	1.2
2023	23,478	61	0.3	964	-106	-9.9	271,595	-28,965	-9.6
2024	23,779	301	1.3	1,023	59	6.1	291,930	20,336	7.5
2025	24,076	297	1.2	1,031	7	0.7	297,737	5,806	2.0
2026	24,280	204	0.8	1,041	10	1.0	303,229	5,493	1.8
2027	24,455	175	0.7	1,046	5	0.5	306,857	3,627	1.2
2028	24,612	157	0.6	1,053	7	0.7	310,878	4,021	1.3
2029	24,759	147	0.6	1,051	-2	-0.1	312,280	1,402	0.5
2030	24,911	152	0.6	1,054	3	0.3	314,984	2,704	0.9
2031	25,070	159	0.6	1,058	5	0.4	318,350	3,365	1.1
2032	25,225	155	0.6	1,067	9	0.8	322,922	4,573	1.4
2033	25,372	147	0.6	1,067	0	0.0	324,928	2,005	0.6
2034	25,509	137	0.5	1,072	4	0.4	328,025	3,098	1.0
2035	25,637	128	0.5	1,078	6	0.6	331,539	3,514	1.1
2036	25,757	120	0.5	1,088	10	1.0	336,334	4,796	1.4
2037	25,871	114	0.4	1,092	3	0.3	338,901	2,567	0.8
2038	25,976	105	0.4	1,099	7	0.6	342,432	3,530	1.0
2039	26,071	95	0.4	1,106	8	0.7	346,073	3,641	1.1
2040	26,162	91	0.3	1,118	12	1.1	351,065	4,993	1.4
2041	26,248	86	0.3	1,123	5	0.4	353,682	2,616	0.7
2042	26,327	79	0.3	1,133	10	0.9	357,786	4,104	1.2
2043	26,397	70	0.3	1,143	10	0.9	362,049	4,263	1.2
2044	26,460	63	0.2	1,158	15	1.3	367,640	5,591	1.5

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,679	41	2.5	71	-1	-0.8	119,635	1,965	1.7
2015	1,692	13	0.8	74	2	3.2	124,464	4,830	4.0
2016	1,717	25	1.5	76	3	3.9	131,182	6,717	5.4
2017	1,732	15	0.9	75	-2	-2.4	129,214	-1,968	-1.5
2018	1,733	1	0.1	78	4	4.9	135,613	6,400	5.0
2019	1,759	26	1.5	75	-3	-4.4	131,651	-3,962	-2.9
2020	1,773	14	0.8	69	-6	-7.6	122,649	-9,002	-6.8
2021	1,782	9	0.5	72	3	4.3	128,599	5,950	4.9
2022	2,046	264	14.8	63	-9	-12.1	129,858	1,260	1.0
2023	2,231	185	9.0	59	-5	-7.6	130,849	991	0.8
2024	2,245	14	0.6	59	0	0.6	132,513	1,664	1.3
2025	2,259	14	0.6	58	-1	-1.0	132,053	-460	-0.3
2026	2,273	14	0.6	58	0	-0.6	132,026	-27	0.0
2027	2,287	14	0.6	58	-1	-0.9	131,680	-346	-0.3
2028	2,301	14	0.6	57	0	-0.5	131,876	196	0.1
2029	2,315	14	0.6	57	-1	-0.9	131,498	-378	-0.3
2030	2,329	14	0.6	56	0	-0.7	131,314	-184	-0.1
2031	2,343	14	0.6	56	0	-0.6	131,345	31	0.0
2032	2,357	14	0.6	56	0	-0.1	131,944	600	0.5
2033	2,371	14	0.6	56	0	-0.6	131,879	-66	0.0
2034	2,384	13	0.5	55	0	-0.3	132,230	351	0.3
2035	2,397	13	0.5	55	0	-0.3	132,611	381	0.3
2036	2,409	12	0.5	55	0	0.0	133,318	707	0.5
2037	2,420	11	0.5	55	0	-0.4	133,441	123	0.1
2038	2,431	11	0.5	55	0	-0.1	133,927	486	0.4
2039	2,440	9	0.4	55	0	0.0	134,428	501	0.4
2040	2,449	9	0.4	55	0	0.1	135,041	613	0.5
2041	2,458	9	0.4	55	0	-0.3	135,075	34	0.0
2042	2,466	8	0.3	55	0	0.0	135,481	406	0.3
2043	2,472	6	0.2	55	0	0.1	136,000	519	0.4
2044	2,479	7	0.3	55	0	0.4	136,879	879	0.6

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Fleming-Mason Energy had 6 consumer in this class and consumers are projected to increase to 9 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	5	0	0.0	103,292	16,161	18.5	516,461	80,804	18.5
2015	5	0	0.0	90,295	-12,998	-12.6	451,473	-64,988	-12.6
2016	5	0	0.0	113,039	22,744	25.2	565,193	113,720	25.2
2017	5	0	0.0	115,904	2,865	2.5	579,518	14,325	2.5
2018	5	0	0.0	105,760	-10,143	-8.8	528,802	-50,715	-8.8
2019	5	0	0.0	96,128	-9,632	-9.1	480,640	-48,162	-9.1
2020	6	1	20.0	96,162	34	0.0	576,972	96,332	20.0
2021	6	0	0.0	104,556	8,394	8.7	627,338	50,366	8.7
2022	6	0	0.0	94,985	-9,571	-9.2	569,911	-57,427	-9.2
2023	6	0	0.0	99,735	4,750	5.0	598,409	28,498	5.0
2024	6	0	0.0	91,713	-8,022	-8.0	550,280	-48,130	-8.0
2025	6	0	0.0	91,713	0	0.0	550,280	0	0.0
2026	6	0	0.0	91,713	0	0.0	550,280	0	0.0
2027	6	0	0.0	91,713	0	0.0	550,280	0	0.0
2028	7	1	16.7	79,925	-11,788	-12.9	559,478	9,198	1.7
2029	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2030	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2031	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2032	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2033	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2034	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2035	7	0	0.0	79,925	0	0.0	559,478	0	0.0
2036	8	1	14.3	71,084	-8,841	-11.1	568,676	9,198	1.6
2037	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2038	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2039	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2040	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2041	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2042	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2043	8	0	0.0	71,084	0	0.0	568,676	0	0.0
2044	9	1	12.5	64,208	-6,876	-9.7	577,874	9,198	1.6

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Fleming-Mason Energy serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	5	0	0.0	1,556	35	2.3	93	2	2.3
2015	5	0	0.0	1,562	6	0.4	94	0	0.4
2016	5	0	0.0	1,553	-10	-0.6	93	-1	-0.6
2017	5	0	0.0	1,532	-21	-1.3	92	-1	-1.3
2018	6	1	20.0	1,394	-138	-9.0	100	8	9.2
2019	6	0	0.0	1,433	39	2.8	103	3	2.8
2020	6	0	0.0	1,421	-12	-0.9	102	-1	-0.9
2021	6	0	0.0	1,403	-18	-1.2	101	-1	-1.2
2022	6	0	0.0	1,376	-27	-1.9	99	-2	-1.9
2023	6	0	0.0	1,358	-18	-1.3	98	-1	-1.3
2024	6	0	0.0	1,358	0	0.0	98	0	0.0
2025	6	0	0.0	1,358	0	0.0	98	0	0.0
2026	6	0	0.0	1,358	0	0.0	98	0	0.0
2027	6	0	0.0	1,358	0	0.0	98	0	0.0
2028	6	0	0.0	1,358	0	0.0	98	0	0.0
2029	6	0	0.0	1,358	0	0.0	98	0	0.0
2030	6	0	0.0	1,358	0	0.0	98	0	0.0
2031	6	0	0.0	1,358	0	0.0	98	0	0.0
2032	6	0	0.0	1,358	0	0.0	98	0	0.0
2033	6	0	0.0	1,358	0	0.0	98	0	0.0
2034	6	0	0.0	1,358	0	0.0	98	0	0.0
2035	6	0	0.0	1,358	0	0.0	98	0	0.0
2036	6	0	0.0	1,358	0	0.0	98	0	0.0
2037	6	0	0.0	1,358	0	0.0	98	0	0.0
2038	6	0	0.0	1,358	0	0.0	98	0	0.0
2039	6	0	0.0	1,358	0	0.0	98	0	0.0
2040	6	0	0.0	1,358	0	0.0	98	0	0.0
2041	6	0	0.0	1,358	0	0.0	98	0	0.0
2042	6	0	0.0	1,358	0	0.0	98	0	0.0
2043	6	0	0.0	1,358	0	0.0	98	0	0.0
2044	6	0	0.0	1,358	0	0.0	98	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Fleming-Mason Energy's peak demands. Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal	Extreme		
Degrees	-2	-7	-11	-14
Occurs Once in …	2 Years	5 Years	10 Years	30 Years
Non-coincident Winter Peak Demand - MW				
Season	Normal	Extreme		
2024 - 25	241	249	255	260
2025 - 26	243	251	257	262
2026 - 27	244	252	258	263
2027 - 28	247	255	261	266
2028 - 29	247	255	261	266
2029 - 30	248	256	262	267
2030 - 31	249	257	263	268
2031 - 32	251	259	265	270
2032 - 33	251	259	265	270
2033 - 34	252	260	266	271
2034 - 35	253	261	268	272
2035 - 36	257	265	271	276
2036 - 37	257	265	272	277
2037 - 38	259	267	273	278
2038 - 39	260	268	274	279
2039 - 40	262	270	276	281
2040 - 41	262	270	277	282
2041 - 42	264	272	278	283
2042 - 43	265	273	280	284
2043 - 44	269	277	283	288

Summer Peak Day Maximum Temperatures				
	Normal		Extreme	
Degrees	96	99	100	102
Occurs Once in …	2 Years	5 Years	10 Years	30 Years
Non-coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	172	176	178	180
2025	172	176	178	181
2026	174	178	179	182
2027	174	179	180	183
2028	177	181	183	186
2029	177	182	183	186
2030	178	182	184	187
2031	179	183	185	188
2032	180	185	186	189
2033	181	185	187	190
2034	182	186	188	191
2035	183	187	189	192
2036	186	190	192	195
2037	186	191	192	195
2038	187	192	193	197
2039	189	193	195	198
2040	190	195	196	199
2041	191	195	197	200
2042	192	197	198	201
2043	193	198	200	203
2044	197	201	203	206

South Kentucky Rural Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

South Kentucky RECC
A Touchstone Energy Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

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Introduction

Executive Summary

South Kentucky Rural Electric Cooperative Corporation (South Kentucky RECC) , located in Somerset, Kentucky, is an electric distribution cooperative that serves members in 11 counties in Kentucky and 2 counties in Tennessee. This load forecast report contains South Kentucky RECC's long-range forecast of energy and seasonal peak demand.

South Kentucky RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by South Kentucky RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of South Kentucky RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and South Kentucky RECC. Cooperation helps to ensure that the forecast meets both parties' needs. South Kentucky RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for South Kentucky RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Public Street and Highway Lighting (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	837,685	280,037	13,563	178,328	1,270	1,310,883	527	4.6	1,374,317
2015	789,018	276,787	13,085	190,817	1,274	1,270,981	572	3.7	1,320,602
2016	772,769	272,595	12,871	192,713	1,257	1,252,206	965	6.1	1,334,196
2017	728,983	266,588	12,177	192,162	1,041	1,200,951	1,184	5.7	1,274,648
2018	838,521	281,646	14,520	189,362	940	1,324,988	1,251	3.8	1,379,207
2019	792,508	272,513	13,484	182,947	909	1,262,361	1,267	4.6	1,324,843
2020	774,595	253,356	11,264	176,579	872	1,216,666	1,193	6.2	1,298,052
2021	819,860	266,290	12,936	187,350	833	1,287,269	1,163	3.6	1,336,763
2022	807,427	269,398	12,966	179,835	806	1,270,432	1,113	7.0	1,367,579
2023	740,985	256,197	12,109	183,178	804	1,193,273	1,143	4.2	1,246,209
2024	786,634	268,363	13,162	183,730	808	1,252,697	1,176	5.1	1,321,514
2025	799,820	268,590	13,355	184,832	808	1,267,404	1,176	5.1	1,337,014
2026	809,824	268,027	13,385	195,279	808	1,287,322	1,176	5.1	1,358,007
2027	816,070	266,801	13,366	205,348	808	1,302,393	1,176	5.1	1,373,890
2028	823,336	266,837	13,384	215,361	808	1,319,726	1,176	5.1	1,392,159
2029	824,239	265,284	13,334	215,939	808	1,319,603	1,176	5.1	1,392,029
2030	828,187	263,769	13,313	216,268	808	1,322,345	1,176	5.1	1,394,919
2031	832,506	262,488	13,306	225,826	808	1,334,933	1,176	5.1	1,408,186
2032	839,414	262,082	13,336	235,437	808	1,351,076	1,176	5.1	1,425,200
2033	840,658	260,252	13,300	245,095	808	1,360,113	1,176	5.1	1,434,724
2034	844,530	259,186	13,296	245,579	808	1,363,399	1,176	5.1	1,438,187
2035	849,330	258,305	13,301	255,176	808	1,376,920	1,176	5.1	1,452,437
2036	857,272	258,297	13,346	264,636	808	1,394,358	1,176	5.1	1,470,817
2037	860,200	257,154	13,342	273,988	808	1,405,492	1,176	5.1	1,482,551
2038	865,673	256,887	13,372	274,142	808	1,410,883	1,176	5.1	1,488,233
2039	871,536	256,653	13,406	283,491	808	1,425,894	1,176	5.1	1,504,053
2040	880,561	256,695	13,467	292,857	808	1,444,386	1,176	5.1	1,523,544
2041	884,201	255,446	13,469	302,252	808	1,456,176	1,176	5.1	1,535,969
2042	891,564	255,123	13,512	302,477	808	1,463,484	1,176	5.1	1,543,671
2043	899,505	255,138	13,567	311,938	808	1,480,956	1,176	5.1	1,562,086
2044	910,570	255,992	13,661	321,377	808	1,502,408	1,176	5.1	1,584,695

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*					
Season	Non-Coincident Peak Demand	Year	Non-Coincident Peak Demand	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	461.2	2014	245.4	2014	1,374,317	34.0%	0° F	88° F
2014 - 15	466.8	2015	254.0	2015	1,320,602	32.3%	-15° F	88° F
2015- 16	378.8	2016	263.6	2016	1,334,196	40.1%	7° F	91° F
2016 - 17	369.2	2017	260.6	2017	1,274,648	39.4%	9° F	90° F
2017 - 18	438.5	2018	263.2	2018	1,379,207	35.9%	-6° F	91° F
2018 - 19	366.4	2019	259.5	2019	1,324,843	41.3%	10° F	91° F
2019 - 20	343.0	2020	268.5	2020	1,298,052	43.1%	14° F	91° F
2020 - 21	352.4	2021	263.2	2021	1,336,763	43.3%	12° F	91° F
2021 - 22	385.7	2022	275.7	2022	1,367,579	40.5%	7° F	95° F
2022 - 23	488.3	2023	267.2	2023	1,246,209	29.1%	-4° F	95° F
2023 - 24	482.4	2024	273.3	2024	1,321,514	31.2%	-2° F	
2024 - 25	474.3	2025	275.9	2025	1,337,014	32.2%		
2025 - 26	479.0	2026	279.5	2026	1,358,007	32.4%		
2026 - 27	482.2	2027	282.1	2027	1,373,890	32.5%		
2027 - 28	486.2	2028	284.8	2028	1,392,159	32.6%		
2028 - 29	485.5	2029	285.1	2029	1,392,029	32.7%		
2029 - 30	486.1	2030	285.5	2030	1,394,919	32.8%		
2030 - 31	488.2	2031	287.7	2031	1,408,186	32.9%		
2031 - 32	491.8	2032	290.2	2032	1,425,200	33.0%		
2032 - 33	492.6	2033	292.0	2033	1,434,724	33.3%		
2033 - 34	493.2	2034	292.6	2034	1,438,187	33.3%		
2034 - 35	495.7	2035	294.9	2035	1,452,437	33.5%		
2035 - 36	499.6	2036	297.7	2036	1,470,817	33.5%		
2036 - 37	500.9	2037	299.9	2037	1,482,551	33.8%		
2037 - 38	502.0	2038	300.9	2038	1,488,233	33.8%		
2038 - 39	504.8	2039	303.5	2039	1,504,053	34.0%		
2039 - 40	508.9	2040	306.5	2040	1,523,544	34.1%		
2040 - 41	510.3	2041	308.8	2041	1,535,969	34.4%		
2041 - 42	511.9	2042	310.2	2042	1,543,671	34.4%		
2042 - 43	515.3	2043	313.3	2043	1,562,086	34.6%		
2043 - 44	520.2	2044	316.8	2044	1,584,695	34.8%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 0.9 percent a year for the period 2024-2044, compared to a 1.0 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.5 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 0.7 percent.

- Load factor increases from 32.2% to 34.8% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*
Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Public Buildings	Large Commercial	Public Street / Highway Lighting	Total Sales
5-Year	2018 - 2023	-2.4%	-1.9%	-3.6%	-0.7%	-3.1%	-2.1%
	2024 - 2029	0.9%	-0.2%	0.3%	3.3%	0.0%	1.0%
10-Year	2013 - 2023	-0.7%	-1.1%	-0.2%	2.1%	-4.2%	-0.4%
	2024 - 2034	0.7%	-0.3%	0.1%	2.9%	0.0%	0.9%
15-Year	2008 - 2023	-0.7%	-0.2%	0.4%	0.5%	-4.9%	-0.4%
	2024 - 2039	0.7%	-0.3%	0.1%	2.9%	0.0%	0.9%
20-Year	2003 - 2023	0.2%	0.8%	1.0%	3.0%	0.6%	0.7%
	2024 - 2044	0.7%	-0.2%	0.2%	2.8%	0.0%	0.9%

Growth rates shown are Compound Annual Growth Rates.

Narrative

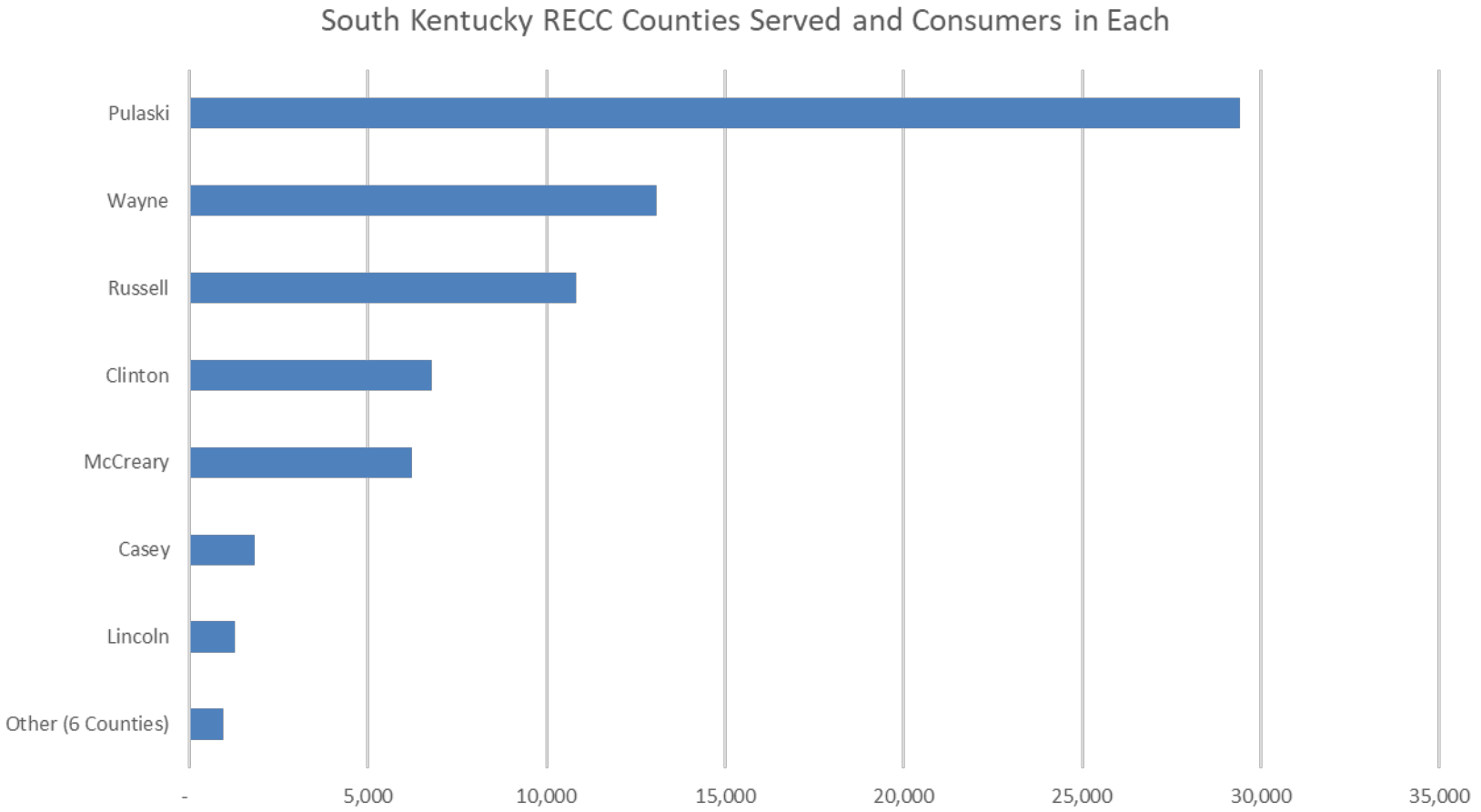
The service area of South Kentucky RECC is located in the southern Kentucky Counties of Adair, Casey, Clinton, Cumberland, Laurel, Lincoln, McCreary, Pulaski, Rockcastle, Russell, and Wayne with some territory in northern Tennessee, see Figure 1-1.

The average household has 2.2 people; 80 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

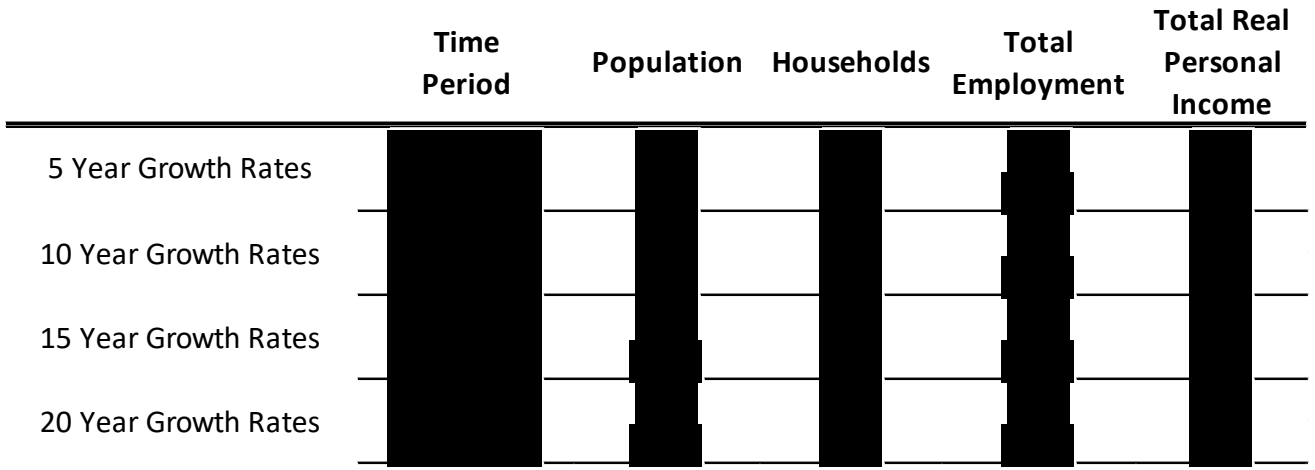
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 80% of consumers use electricity as a primary fuel for heating, while 15% use it as a secondary fuel.
  - 17% use electric furnaces and 54% use electric heat pumps.
- 96% of consumers use electricity for cooling
  - Of those with electric cooling, 89% use central air and 11% use electric window units.
- 94% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the SME weather station at Somerset Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for South Kentucky RECC as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after South Kentucky RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4 South Kentucky RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	1,374,317,307	4.0%	1,310,882,736	5.2%	62,907,223	4.6%	447.0	35.1%	66,530	6,787	9.8	$100,431,511	7.3
2015	1,320,602,148	-3.9%	1,270,980,723	-3.0%	49,048,990	3.7%	458.9	32.9%	66,763	6,813	9.8	$93,010,261	7.0
2016	1,334,195,975	1.0%	1,252,206,334	-1.5%	81,024,411	6.1%	352.2	43.1%	67,067	6,836	9.8	$91,258,444	6.8
2017	1,274,648,341	-4.5%	1,200,951,081	-4.1%	72,513,257	5.7%	353.4	41.2%	67,436	6,866	9.8	$87,589,528	6.9
2018	1,379,206,804	8.2%	1,324,987,551	10.3%	52,967,855	3.8%	426.2	36.9%	67,871	6,900	9.8	$93,174,723	6.8
2019	1,324,842,733	-3.9%	1,262,361,405	-4.7%	61,214,790	4.6%	343.9	44.0%	68,245	6,932	9.8	$89,222,317	6.7
2020	1,298,051,896	-2.0%	1,216,666,214	-3.6%	80,192,753	6.2%	336.3	43.9%	68,773	6,971	9.9	$82,678,137	6.4
2021	1,336,763,224	3.0%	1,287,268,634	5.8%	48,331,339	3.6%	348.7	43.8%	69,713	7,018	9.9	$96,010,219	7.2
2022	1,367,579,312	2.3%	1,270,432,326	-1.3%	96,034,350	7.0%	462.2	33.8%	70,355	7,062	10.0	$120,218,607	8.8
2023	1,246,208,569	-8.9%	1,193,273,498	-6.1%	51,791,929	4.2%	327.6	43.4%	70,514	7,099	9.9	$107,061,154	8.6

5 Year Average (2019-2023) 5.1%

Methodology and Results *(continued)*

The preliminary forecast was presented to South Kentucky RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from South Kentucky RECC staff staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports South Kentucky RECC staff's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports South Kentucky RECC staff's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	60,800	182	0.3	1,148	52	4.7	837,685	40,032	5.0
2015	60,801	1	0.0	1,081	-67	-5.8	789,018	-48,668	-5.8
2016	61,069	268	0.4	1,055	-27	-2.5	772,769	-16,248	-2.1
2017	61,391	322	0.5	990	-65	-6.2	728,983	-43,787	-5.7
2018	61,813	422	0.7	1,130	141	14.2	838,521	109,538	15.0
2019	62,138	325	0.5	1,063	-68	-6.0	792,508	-46,012	-5.5
2020	62,657	519	0.8	1,030	-33	-3.1	774,595	-17,914	-2.3
2021	63,455	798	1.3	1,077	46	4.5	819,860	45,266	5.8
2022	63,940	485	0.8	1,052	-24	-2.3	807,427	-12,433	-1.5
2023	64,062	122	0.2	964	-88	-8.4	740,985	-66,442	-8.2
2024	64,453	391	0.6	1,017	53	5.5	786,634	45,648	6.2
2025	64,839	386	0.6	1,028	11	1.1	799,820	13,186	1.7
2026	65,215	376	0.6	1,035	7	0.7	809,824	10,005	1.3
2027	65,556	341	0.5	1,037	3	0.2	816,070	6,245	0.8
2028	65,845	289	0.4	1,042	5	0.4	823,336	7,267	0.9
2029	66,094	249	0.4	1,039	-3	-0.3	824,239	903	0.1
2030	66,344	250	0.4	1,040	1	0.1	828,187	3,948	0.5
2031	66,598	254	0.4	1,042	1	0.1	832,506	4,319	0.5
2032	66,824	226	0.3	1,047	5	0.5	839,414	6,908	0.8
2033	67,025	201	0.3	1,045	-2	-0.2	840,658	1,244	0.1
2034	67,193	168	0.3	1,047	2	0.2	844,530	3,872	0.5
2035	67,333	140	0.2	1,051	4	0.4	849,330	4,800	0.6
2036	67,456	123	0.2	1,059	8	0.8	857,272	7,942	0.9
2037	67,582	126	0.2	1,061	2	0.2	860,200	2,928	0.3
2038	67,702	120	0.2	1,066	5	0.5	865,673	5,473	0.6
2039	67,809	107	0.2	1,071	6	0.5	871,536	5,863	0.7
2040	67,911	102	0.2	1,081	9	0.9	880,561	9,024	1.0
2041	68,014	103	0.2	1,083	3	0.3	884,201	3,641	0.4
2042	68,123	109	0.2	1,091	7	0.7	891,564	7,363	0.8
2043	68,226	103	0.2	1,099	8	0.7	899,505	7,940	0.9
2044	68,314	88	0.1	1,111	12	1.1	910,570	11,065	1.2

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	4,834	66	1.4	58	-2	-3.3	280,037	-6,312	-2.2
2015	5,048	214	4.4	55	-3	-5.2	276,787	-3,250	-1.2
2016	5,073	25	0.5	54	-1	-1.8	272,595	-4,191	-1.5
2017	5,103	30	0.6	52	-2	-3.7	266,588	-6,007	-2.2
2018	5,108	5	0.1	55	3	5.8	281,646	15,058	5.6
2019	5,152	44	0.9	53	-2	-3.6	272,513	-9,133	-3.2
2020	5,149	-3	-0.1	49	-4	-7.5	253,356	-19,156	-7.0
2021	5,279	130	2.5	50	1	2.0	266,290	12,933	5.1
2022	5,430	151	2.9	50	0	0.0	269,398	3,109	1.2
2023	5,452	22	0.4	47	-3	-6.0	256,197	-13,201	-4.9
2024	5,484	32	0.6	49	2	4.3	268,363	12,166	4.7
2025	5,524	40	0.7	49	0	0.0	268,590	227	0.1
2026	5,573	49	0.9	48	-1	-2.0	268,027	-564	-0.2
2027	5,626	53	1.0	47	-1	-2.1	266,801	-1,226	-0.5
2028	5,685	59	1.0	47	0	0.0	266,837	37	0.0
2029	5,741	56	1.0	46	-1	-2.1	265,284	-1,554	-0.6
2030	5,798	57	1.0	45	-1	-2.2	263,769	-1,514	-0.6
2031	5,854	56	1.0	45	0	0.0	262,488	-1,281	-0.5
2032	5,908	54	0.9	44	-1	-2.2	262,082	-406	-0.2
2033	5,961	53	0.9	44	0	0.0	260,252	-1,829	-0.7
2034	6,011	50	0.8	43	-1	-2.3	259,186	-1,067	-0.4
2035	6,060	49	0.8	43	0	0.0	258,305	-881	-0.3
2036	6,107	47	0.8	42	-1	-2.3	258,297	-8	0.0
2037	6,154	47	0.8	42	0	0.0	257,154	-1,143	-0.4
2038	6,201	47	0.8	41	-1	-2.4	256,887	-267	-0.1
2039	6,247	46	0.7	41	0	0.0	256,653	-235	-0.1
2040	6,292	45	0.7	41	0	0.0	256,695	42	0.0
2041	6,338	46	0.7	40	-1	-2.4	255,446	-1,249	-0.5
2042	6,384	46	0.7	40	0	0.0	255,123	-323	-0.1
2043	6,430	46	0.7	40	0	0.0	255,138	15	0.0
2044	6,474	44	0.7	40	0	0.0	255,992	854	0.3

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 South Kentucky RECC had 37 consumers in this class and consumers are projected to increase to 51 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	20	2	11.1	8,916	651	7.9	178,328	29,548	19.9
2015	22	2	10.0	8,673	-243	-2.7	190,817	12,489	7.0
2016	25	3	13.6	7,709	-965	-11.1	192,713	1,896	1.0
2017	28	3	12.0	6,863	-846	-11.0	192,162	-552	-0.3
2018	27	-1	-3.6	7,013	150	2.2	189,362	-2,800	-1.5
2019	28	1	3.7	6,534	-480	-6.8	182,947	-6,414	-3.4
2020	31	3	10.7	5,696	-838	-12.8	176,579	-6,368	-3.5
2021	33	2	6.5	5,677	-19	-0.3	187,350	10,770	6.1
2022	35	2	6.1	5,138	-539	-9.5	179,835	-7,515	-4.0
2023	37	2	5.7	4,951	-187	-3.6	183,178	3,343	1.9
2024	37	0	0.0	4,966	15	0.3	183,730	552	0.3
2025	37	0	0.0	4,995	30	0.6	184,832	1,101	0.6
2026	38	1	2.7	5,139	143	2.9	195,279	10,447	5.7
2027	39	1	2.6	5,265	126	2.5	205,348	10,069	5.2
2028	40	1	2.6	5,384	119	2.3	215,361	10,012	4.9
2029	40	0	0.0	5,398	14	0.3	215,939	578	0.3
2030	40	0	0.0	5,407	8	0.2	216,268	329	0.2
2031	41	1	2.5	5,508	101	1.9	225,826	9,558	4.4
2032	42	1	2.4	5,606	98	1.8	235,437	9,611	4.3
2033	43	1	2.4	5,700	94	1.7	245,095	9,658	4.1
2034	43	0	0.0	5,711	11	0.2	245,579	485	0.2
2035	44	1	2.3	5,799	88	1.5	255,176	9,596	3.9
2036	45	1	2.3	5,881	81	1.4	264,636	9,460	3.7
2037	46	1	2.2	5,956	75	1.3	273,988	9,353	3.5
2038	46	0	0.0	5,960	3	0.1	274,142	154	0.1
2039	47	1	2.2	6,032	72	1.2	283,491	9,348	3.4
2040	48	1	2.1	6,101	69	1.2	292,857	9,366	3.3
2041	49	1	2.1	6,168	67	1.1	302,252	9,395	3.2
2042	49	0	0.0	6,173	5	0.1	302,477	225	0.1
2043	50	1	2.0	6,239	66	1.1	311,938	9,461	3.1
2044	51	1	2.0	6,302	63	1.0	321,377	9,439	3.0

Methodology and Results *(continued)*

Public Buildings Forecast

South Kentucky RECC reports a Public Buildings class. Sales are projected using two equations, a customer equation and a sales equation, similar to the residential forecasts. Projections are reported in Table 1-8.

Table 1-8

Public Buildings Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	853	8	0.9	1,325	108	8.9	13,563	1,227	9.9
2015	869	16	1.9	1,255	-70	-5.3	13,085	-478	-3.5
2016	876	7	0.8	1,224	-30	-2.4	12,871	-214	-1.6
2017	892	16	1.8	1,138	-87	-7.1	12,177	-693	-5.4
2018	901	9	1.0	1,343	205	18.0	14,520	2,342	19.2
2019	905	4	0.4	1,242	-101	-7.5	13,484	-1,035	-7.1
2020	915	10	1.1	1,026	-216	-17.4	11,264	-2,220	-16.5
2021	925	10	1.1	1,165	140	13.6	12,936	1,672	14.8
2022	929	4	0.4	1,163	-2	-0.2	12,966	30	0.2
2023	941	12	1.3	1,072	-91	-7.8	12,109	-857	-6.6
2024	953	12	1.3	1,151	79	7.3	13,162	1,053	8.7
2025	963	10	1.0	1,156	5	0.4	13,355	193	1.5
2026	972	9	0.9	1,148	-8	-0.7	13,385	30	0.2
2027	982	10	1.0	1,134	-13	-1.2	13,366	-18	-0.1
2028	991	9	0.9	1,125	-9	-0.8	13,384	18	0.1
2029	1,001	10	1.0	1,110	-15	-1.4	13,334	-51	-0.4
2030	1,011	10	1.0	1,097	-13	-1.1	13,313	-21	-0.2
2031	1,020	9	0.9	1,087	-10	-0.9	13,306	-7	-0.1
2032	1,030	10	1.0	1,079	-8	-0.7	13,336	30	0.2
2033	1,040	10	1.0	1,066	-13	-1.2	13,300	-36	-0.3
2034	1,049	9	0.9	1,056	-9	-0.9	13,296	-4	0.0
2035	1,059	10	1.0	1,047	-10	-0.9	13,301	5	0.0
2036	1,068	9	0.8	1,041	-5	-0.5	13,346	45	0.3
2037	1,078	10	0.9	1,031	-10	-1.0	13,342	-4	0.0
2038	1,088	10	0.9	1,024	-7	-0.7	13,372	30	0.2
2039	1,097	9	0.8	1,018	-6	-0.6	13,406	34	0.3
2040	1,107	10	0.9	1,014	-5	-0.5	13,467	60	0.5
2041	1,117	10	0.9	1,005	-9	-0.9	13,469	2	0.0
2042	1,126	9	0.8	1,000	-5	-0.5	13,512	43	0.3
2043	1,136	10	0.9	995	-5	-0.5	13,567	56	0.4
2044	1,145	9	0.8	994	-1	-0.1	13,661	94	0.7

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

South Kentucky RECC serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-9.

Table 1-9

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	23	0	0.0	4,600	124	2.8	1,270	34	2.8
2015	23	0	0.0	4,617	16	0.4	1,274	5	0.4
2016	24	1	4.3	4,366	-250	-5.4	1,257	-17	-1.3
2017	22	-2	-8.3	3,944	-422	-9.7	1,041	-216	-17.2
2018	22	0	0.0	3,560	-383	-9.7	940	-101	-9.7
2019	22	0	0.0	3,442	-118	-3.3	909	-31	-3.3
2020	21	-1	-4.5	3,459	17	0.5	872	-37	-4.1
2021	21	0	0.0	3,304	-155	-4.5	833	-39	-4.5
2022	21	0	0.0	3,197	-107	-3.2	806	-27	-3.2
2023	22	1	4.8	3,046	-152	-4.7	804	-2	-0.2
2024	22	0	0.0	3,060	14	0.5	808	4	0.5
2025	22	0	0.0	3,060	0	0.0	808	0	0.0
2026	22	0	0.0	3,060	0	0.0	808	0	0.0
2027	22	0	0.0	3,060	0	0.0	808	0	0.0
2028	22	0	0.0	3,060	0	0.0	808	0	0.0
2029	22	0	0.0	3,060	0	0.0	808	0	0.0
2030	22	0	0.0	3,060	0	0.0	808	0	0.0
2031	22	0	0.0	3,060	0	0.0	808	0	0.0
2032	22	0	0.0	3,060	0	0.0	808	0	0.0
2033	22	0	0.0	3,060	0	0.0	808	0	0.0
2034	22	0	0.0	3,060	0	0.0	808	0	0.0
2035	22	0	0.0	3,060	0	0.0	808	0	0.0
2036	22	0	0.0	3,060	0	0.0	808	0	0.0
2037	22	0	0.0	3,060	0	0.0	808	0	0.0
2038	22	0	0.0	3,060	0	0.0	808	0	0.0
2039	22	0	0.0	3,060	0	0.0	808	0	0.0
2040	22	0	0.0	3,060	0	0.0	808	0	0.0
2041	22	0	0.0	3,060	0	0.0	808	0	0.0
2042	22	0	0.0	3,060	0	0.0	808	0	0.0
2043	22	0	0.0	3,060	0	0.0	808	0	0.0
2044	22	0	0.0	3,060	0	0.0	808	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence South Kentucky RECC's peak demands. Table 1-10 reports the impact of extreme temperature on system demands.

Table 1-10: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		Extreme	
Degrees	1	-7	-14	-16
Occurs Once in …	2 Years	5 Years	10 Years	30 Years

Noncoincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	474	504	560	624
2025 - 26	479	509	565	629
2026 - 27	482	512	569	633
2027 - 28	486	517	573	638
2028 - 29	486	516	573	638
2029 - 30	486	517	574	639
2030 - 31	488	519	577	642
2031 - 32	492	523	580	646
2032 - 33	493	523	581	647
2033 - 34	493	524	582	648
2034 - 35	496	527	585	651
2035 - 36	500	531	589	655
2036 - 37	501	532	590	657
2037 - 38	502	533	592	658
2038 - 39	505	536	595	661
2039 - 40	509	540	599	665
2040 - 41	510	542	600	667
2041 - 42	512	543	602	669
2042 - 43	515	547	606	673
2043 - 44	520	552	611	678

Summer Peak Day Maximum Temperatures				
	Normal		Extreme	
Degrees	96	100	102	104
Occurs Once in …	2 Years	5 Years	10 Years	30 Years

Noncoincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	273	290	299	307
2025	276	293	301	310
2026	279	296	305	314
2027	282	299	308	316
2028	285	302	311	319
2029	285	302	311	320
2030	286	303	311	320
2031	288	305	314	322
2032	290	307	316	325
2033	292	309	318	327
2034	293	310	319	328
2035	295	312	321	330
2036	298	315	324	333
2037	300	317	326	335
2038	301	318	327	336
2039	304	321	330	339
2040	306	324	333	342
2041	309	326	335	344
2042	310	328	337	346
2043	313	331	340	349
2044	317	334	344	352

Licking Valley Rural Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

LICKING VALLEY Rural Electric Cooperative Corporation
A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Licking Valley Rural Electric Cooperative Corporation (Licking Valley RECC), located in West Liberty, Kentucky, is an electric distribution cooperative that serves members in eight counties. This load forecast report contains Licking Valley RECC's long-range forecast of energy and peak demand.

Licking Valley RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Licking Valley RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Licking Valley RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Licking Valley RECC. Cooperation helps to ensure that the forecast meets both parties' needs. Licking Valley RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Licking Valley RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	198,291	43,456	16,938	258,685	169	6.7	277,479
2015	188,336	41,883	14,644	244,863	151	6.7	262,567
2016	190,959	40,936	14,289	246,184	149	6.2	262,488
2017	180,990	39,446	13,740	234,176	143	5.1	247,024
2018	191,363	40,833	13,755	245,951	183	7.7	266,561
2019	186,849	40,490	12,477	239,815	159	6.1	255,561
2020	188,110	38,382	11,407	237,899	150	5.1	250,938
2021	189,480	40,094	11,675	241,250	147	5.2	254,573
2022	191,769	41,620	11,688	245,076	142	6.5	262,390
2023	177,963	39,014	42,762	259,739	133	4.5	272,078
2024	190,610	40,574	107,590	338,774	146	4.1	353,350
2025	193,462	40,600	107,590	341,652	146	4.1	356,399
2026	196,492	40,503	107,590	344,585	146	4.1	359,506
2027	198,013	40,217	107,590	345,821	146	4.1	360,815
2028	199,703	40,031	107,590	347,324	146	4.1	362,407
2029	199,817	39,624	203,492	442,934	146	3.3	458,000
2030	200,701	39,271	203,492	443,464	146	3.3	458,561
2031	201,738	38,949	203,492	444,179	146	3.3	459,319
2032	203,523	38,784	203,492	445,800	146	3.3	461,036
2033	203,839	38,443	212,690	454,972	146	3.3	470,753
2034	204,949	38,239	212,690	455,879	146	3.3	471,713
2035	206,439	38,065	212,690	457,194	146	3.3	473,107
2036	208,772	38,025	212,690	459,487	146	3.3	475,536
2037	209,830	37,825	212,690	460,345	146	3.3	476,445
2038	211,540	37,743	212,690	461,973	146	3.4	478,170
2039	213,424	37,678	221,888	472,991	146	3.4	489,841
2040	216,166	37,657	221,888	475,711	146	3.4	492,723
2041	217,515	37,450	221,888	476,853	146	3.4	493,933
2042	219,844	37,370	221,888	479,102	146	3.4	496,316
2043	222,356	37,336	221,888	481,580	146	3.5	498,940
2044	225,744	37,416	221,888	485,048	146	3.5	502,615

Table 1-1 *(continued)*

Peaks Summary

	Winter	*Summer*				*Temperature*	
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	84.4	2014	53.0	2014	277,479	37.5%	-1° F	89° F
2014 - 15	89.3	2015	52.0	2015	262,567	33.6%	-7° F	90° F
2015 - 16	65.2	2016	53.9	2016	262,488	45.8%	6° F	92° F
2016 - 17	62.8	2017	51.6	2017	247,024	44.9%	8° F	92° F
2017 - 18	77.4	2018	53.1	2018	266,561	39.3%	0° F	93° F
2018 - 19	69.4	2019	51.3	2019	255,561	42.0%	4° F	91° F
2019 - 20	61.5	2020	52.7	2020	250,938	46.5%	15° F	91° F
2020 - 21	60.3	2021	51.7	2021	254,573	48.2%	24° F	92° F
2021 - 22	68.0	2022	52.6	2022	262,390	44.1%	6° F	93° F
2022 - 23	83.7	2023	51.0	2023	272,078	37.1%	-3° F	92° F
2023 - 24	91.6	2024	65.4	2024	353,350	43.9%	2° F	
2024 - 25	91.9	2025	66.0	2025	356,399	44.3%		
2025 - 26	92.5	2026	66.4	2026	359,506	44.4%		
2026 - 27	92.7	2027	66.6	2027	360,815	44.4%		
2027 - 28	93.1	2028	66.9	2028	362,407	44.3%		
2028 - 29	105.0	2029	78.9	2029	458,000	49.8%		
2029 - 30	105.1	2030	79.1	2030	458,561	49.8%		
2030 - 31	105.3	2031	79.3	2031	459,319	49.8%		
2031 - 32	105.7	2032	79.6	2032	461,036	49.7%		
2032 - 33	107.1	2033	81.2	2033	470,753	50.2%		
2033 - 34	107.3	2034	81.4	2034	471,713	50.2%		
2034 - 35	107.6	2035	81.7	2035	473,107	50.2%		
2035 - 36	108.2	2036	82.2	2036	475,536	50.1%		
2036 - 37	108.3	2037	82.5	2037	476,445	50.2%		
2037 - 38	108.6	2038	82.8	2038	478,170	50.2%		
2038 - 39	110.5	2039	84.8	2039	489,841	50.6%		
2039 - 40	111.2	2040	85.3	2040	492,723	50.5%		
2040 - 41	111.3	2041	85.6	2041	493,933	50.6%		
2041 - 42	111.8	2042	86.1	2042	496,316	50.7%		
2042 - 43	112.3	2043	86.7	2043	498,940	50.7%		
2043 - 44	113.2	2044	87.4	2044	502,615	50.7%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.8 percent a year for the period 2024-2044, compared to a 0.5 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 1.1 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.5 percent.

- Load factor increases from 44.3% to 50.7% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Total Sales
5-Year	2018 - 2023	-1.4%	-0.9%	25.5%	1.1%
	2024 - 2029	0.9%	-0.5%	13.6%	5.5%
10-Year	2013 - 2023	-1.1%	-0.3%	8.0%	0.1%
	2024 - 2034	0.7%	-0.6%	7.1%	3.0%
15-Year	2008 - 2023	-0.8%	-0.5%	7.4%	0.0%
	2024 - 2039	0.8%	-0.5%	4.9%	2.2%
20-Year	2003 - 2023	-0.3%	-0.3%	6.2%	0.3%
	2024 - 2044	0.8%	-0.4%	3.7%	1.8%

Growth rates shown are Compound Annual Growth Rates.

Narrative

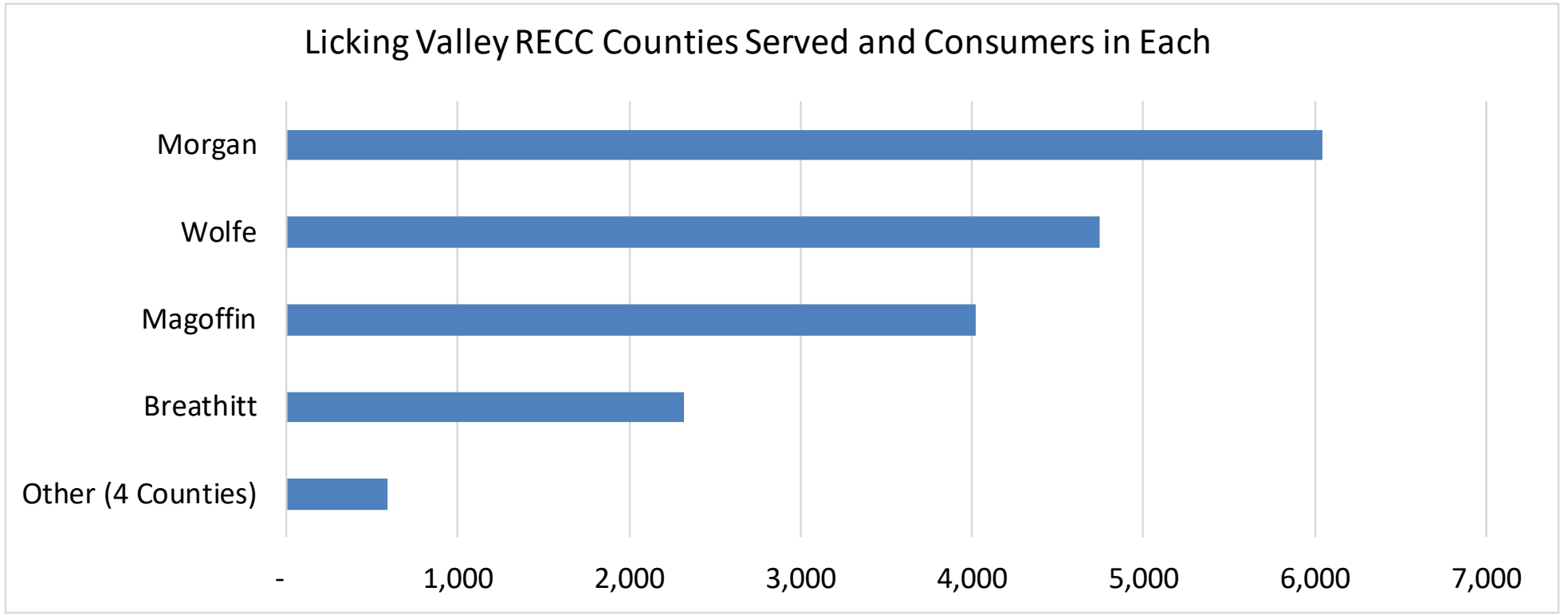
The service area of Licking Valley RECC is located in the eastern Kentucky Counties of Breathitt, Elliott, Lee, Magoffin, Menifee, Morgan, Rowan and Wolfe, see Figure 1-1.

The average household has 2.21 people; 76 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

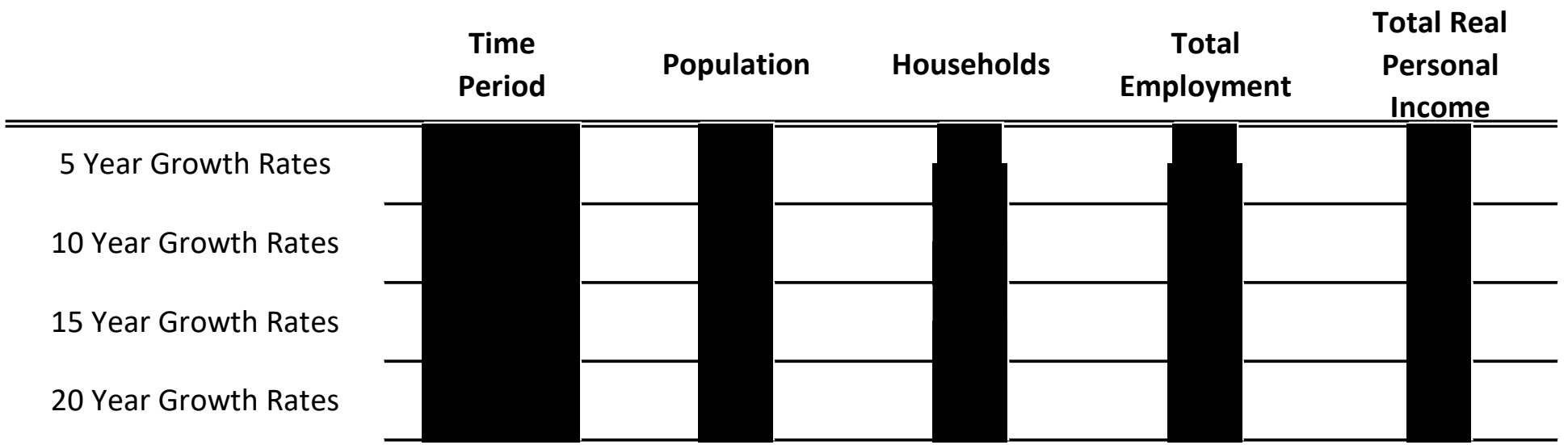
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 60% of consumers use electricity as a primary fuel for heating, while 24% use it as a secondary fuel.
  - 20% use electric furnaces and 36% use electric heat pumps.
- 97% of consumers use electricity for cooling
  - Of those with electric cooling, 76% use central air and 24% use electric window units.
- 94% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the JKL weather station at Jackson Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Licking Valley RECC as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Licking Valley RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Licking Valley RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	277,479,003	1.6%	258,685,316	0.3%	18,624,915	6.7%	81.2	39.0%	17,400	2,057	8.5	$20,366,956	7.3
2015	262,566,679	-5.4%	244,862,815	-5.3%	17,552,409	6.7%	88.6	33.8%	17,323	2,062	8.4	$18,554,532	7.1
2016	262,488,345	0.0%	246,183,633	0.5%	16,155,873	6.2%	62.7	47.6%	17,339	2,070	8.4	$18,013,860	6.9
2017	247,024,092	-5.9%	234,176,209	-4.9%	12,705,129	5.1%	60.7	46.4%	17,342	2,071	8.4	$16,985,401	6.9
2018	266,561,046	7.9%	245,951,224	5.0%	20,426,534	7.7%	75.0	40.6%	17,302	2,073	8.3	$18,084,980	6.8
2019	255,560,565	-4.1%	239,815,397	-2.5%	15,586,256	6.1%	68.0	42.9%	17,266	2,076	8.3	$17,295,450	6.8
2020	250,938,184	-1.8%	237,898,655	-0.8%	12,889,200	5.1%	60.1	47.5%	17,397	2,080	8.4	$16,110,150	6.4
2021	254,573,141	1.4%	241,250,108	1.4%	13,176,013	5.2%	56.3	51.6%	17,542	2,083	8.4	$18,395,213	7.2
2022	262,389,599	3.1%	245,076,401	1.6%	17,171,086	6.5%	82.8	36.2%	17,597	2,092	8.4	$23,218,603	8.8
2023	272,077,956	3.7%	259,738,749	6.0%	12,205,713	4.5%	70.5	44.0%	17,728	2,103	8.4	$22,444,020	8.2
5 Year Average (2019-2023)						5.5%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Licking Valley RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Licking Valley RECC staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Licking Valley RECC's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Licking Valley RECC's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	16,235	1	0.0	1,018	1	0.1	198,291	201	0.1
2015	16,212	-23	-0.1	968	-50	-4.9	188,336	-9,955	-5.0
2016	16,231	19	0.1	980	12	1.3	190,959	2,623	1.4
2017	16,237	6	0.0	929	-52	-5.3	180,990	-9,968	-5.2
2018	16,206	-31	-0.2	984	55	5.9	191,363	10,373	5.7
2019	16,177	-29	-0.2	963	-21	-2.2	186,849	-4,515	-2.4
2020	16,310	133	0.8	961	-1	-0.1	188,110	1,261	0.7
2021	16,457	147	0.9	959	-2	-0.2	189,480	1,370	0.7
2022	16,505	48	0.3	968	9	0.9	191,769	2,288	1.2
2023	16,638	133	0.8	891	-77	-7.9	177,963	-13,806	-7.2
2024	16,768	130	0.8	947	56	6.3	190,610	12,647	7.1
2025	16,869	101	0.6	956	8	0.9	193,462	2,851	1.5
2026	16,936	67	0.4	967	11	1.2	196,492	3,030	1.6
2027	16,969	33	0.2	972	6	0.6	198,013	1,521	0.8
2028	16,986	17	0.1	980	7	0.8	199,703	1,689	0.9
2029	17,002	16	0.1	979	0	0.0	199,817	115	0.1
2030	17,014	12	0.1	983	4	0.4	200,701	884	0.4
2031	17,026	12	0.1	987	4	0.4	201,738	1,037	0.5
2032	17,040	14	0.1	995	8	0.8	203,523	1,785	0.9
2033	17,054	14	0.1	996	1	0.1	203,839	316	0.2
2034	17,070	16	0.1	1,001	4	0.5	204,949	1,110	0.5
2035	17,087	17	0.1	1,007	6	0.6	206,439	1,490	0.7
2036	17,105	18	0.1	1,017	10	1.0	208,772	2,333	1.1
2037	17,122	17	0.1	1,021	4	0.4	209,830	1,058	0.5
2038	17,139	17	0.1	1,029	7	0.7	211,540	1,710	0.8
2039	17,157	18	0.1	1,037	8	0.8	213,424	1,884	0.9
2040	17,175	18	0.1	1,049	12	1.2	216,166	2,742	1.3
2041	17,193	18	0.1	1,054	5	0.5	217,515	1,349	0.6
2042	17,212	19	0.1	1,064	10	1.0	219,844	2,330	1.1
2043	17,229	17	0.1	1,075	11	1.0	222,356	2,511	1.1
2044	17,248	19	0.1	1,091	15	1.4	225,744	3,389	1.5

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,156	-7	-0.6	38	4	11.8	43,456	3,427	8.6
2015	1,103	-53	-4.6	38	0	0.0	41,883	-1,573	-3.6
2016	1,100	-3	-0.3	37	-1	-2.6	40,936	-947	-2.3
2017	1,097	-3	-0.3	36	-1	-2.7	39,446	-1,490	-3.6
2018	1,088	-9	-0.8	38	2	5.6	40,833	1,387	3.5
2019	1,082	-6	-0.6	37	-1	-2.6	40,490	-343	-0.8
2020	1,080	-2	-0.2	36	-1	-2.7	38,382	-2,108	-5.2
2021	1,078	-2	-0.2	37	1	2.8	40,094	1,712	4.5
2022	1,085	7	0.6	38	1	2.7	41,620	1,526	3.8
2023	1,083	-2	-0.2	36	-2	-5.3	39,014	-2,606	-6.3
2024	1,083	0	0.0	37	1	2.8	40,574	1,560	4.0
2025	1,084	1	0.1	37	0	0.0	40,600	27	0.1
2026	1,084	0	0.0	37	0	0.0	40,503	-98	-0.2
2027	1,084	0	0.0	37	0	0.0	40,217	-285	-0.7
2028	1,083	-1	-0.1	37	0	0.0	40,031	-186	-0.5
2029	1,083	0	0.0	37	0	0.0	39,624	-407	-1.0
2030	1,082	-1	-0.1	36	-1	-2.7	39,271	-354	-0.9
2031	1,082	0	0.0	36	0	0.0	38,949	-322	-0.8
2032	1,081	-1	-0.1	36	0	0.0	38,784	-165	-0.4
2033	1,080	-1	-0.1	36	0	0.0	38,443	-341	-0.9
2034	1,080	0	0.0	35	-1	-2.8	38,239	-203	-0.5
2035	1,079	-1	-0.1	35	0	0.0	38,065	-174	-0.5
2036	1,078	-1	-0.1	35	0	0.0	38,025	-40	-0.1
2037	1,077	-1	-0.1	35	0	0.0	37,825	-200	-0.5
2038	1,076	-1	-0.1	35	0	0.0	37,743	-82	-0.2
2039	1,075	-1	-0.1	35	0	0.0	37,678	-65	-0.2
2040	1,074	-1	-0.1	35	0	0.0	37,657	-22	-0.1
2041	1,074	0	0.0	35	0	0.0	37,450	-207	-0.5
2042	1,073	-1	-0.1	35	0	0.0	37,370	-80	-0.2
2043	1,072	-1	-0.1	35	0	0.0	37,336	-34	-0.1
2044	1,071	-1	-0.1	35	0	0.0	37,416	80	0.2

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Licking Valley RECC had 7 consumers in this class and consumers are projected to increase to 11 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	9	-2	-18.2	1,882	83	4.6	16,938	-2,853	-14.4
2015	8	-1	-11.1	1,830	-52	-2.7	14,644	-2,294	-13.5
2016	8	0	0.0	1,786	-44	-2.4	14,289	-355	-2.4
2017	8	0	0.0	1,717	-69	-3.8	13,740	-549	-3.8
2018	8	0	0.0	1,719	2	0.1	13,755	15	0.1
2019	7	-1	-12.5	1,782	63	3.7	12,477	-1,278	-9.3
2020	7	0	0.0	1,630	-153	-8.6	11,407	-1,070	-8.6
2021	7	0	0.0	1,668	38	2.4	11,675	269	2.4
2022	7	0	0.0	1,670	2	0.1	11,688	12	0.1
2023	7	0	0.0	6,109	4,439	265.9	42,762	31,074	265.9
2024	8	1	14.3	13,449	7,340	120.2	107,590	64,828	151.6
2025	8	0	0.0	13,449	0	0.0	107,590	0	0.0
2026	8	0	0.0	13,449	0	0.0	107,590	0	0.0
2027	8	0	0.0	13,449	0	0.0	107,590	0	0.0
2028	8	0	0.0	13,449	0	0.0	107,590	0	0.0
2029	9	1	12.5	22,610	9,162	68.1	203,492	95,902	89.1
2030	9	0	0.0	22,610	0	0.0	203,492	0	0.0
2031	9	0	0.0	22,610	0	0.0	203,492	0	0.0
2032	9	0	0.0	22,610	0	0.0	203,492	0	0.0
2033	10	1	11.1	21,269	-1,341	-5.9	212,690	9,198	4.5
2034	10	0	0.0	21,269	0	0.0	212,690	0	0.0
2035	10	0	0.0	21,269	0	0.0	212,690	0	0.0
2036	10	0	0.0	21,269	0	0.0	212,690	0	0.0
2037	10	0	0.0	21,269	0	0.0	212,690	0	0.0
2038	10	0	0.0	21,269	0	0.0	212,690	0	0.0
2039	11	1	10.0	20,172	-1,097	-5.2	221,888	9,198	4.3
2040	11	0	0.0	20,172	0	0.0	221,888	0	0.0
2041	11	0	0.0	20,172	0	0.0	221,888	0	0.0
2042	11	0	0.0	20,172	0	0.0	221,888	0	0.0
2043	11	0	0.0	20,172	0	0.0	221,888	0	0.0
2044	11	0	0.0	20,172	0	0.0	221,888	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Licking Valley RECC's peak demands. Table 1-8 reports the impact of extreme temperature on system demands.

Table 1-8: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures

	Normal		**Extreme**	
Degrees	1	-7	-10	-15
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Non-coincident Winter Peak Demand - MW

Season	Normal		Extreme	
2024 - 25	92	97	99	103
2025 - 26	92	98	100	103
2026 - 27	93	98	100	104
2027 - 28	93	99	101	104
2028 - 29	105	110	113	116
2029 - 30	105	111	113	116
2030 - 31	105	111	113	116
2031 - 32	106	111	113	117
2032 - 33	107	113	115	118
2033 - 34	107	113	115	118
2034 - 35	108	113	115	119
2035 - 36	108	114	116	119
2036 - 37	108	114	116	119
2037 - 38	109	114	116	120
2038 - 39	111	116	118	122
2039 - 40	111	117	119	122
2040 - 41	111	117	119	122
2041 - 42	112	117	119	123
2042 - 43	112	118	120	123
2043 - 44	113	119	121	124

Summer Peak Day Maximum Temperatures

	Normal		**Extreme**	
Degrees	94	97	99	101
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Non-coincident Summer Peak Demand - MW

Year	Normal		Extreme	
2024	65	69	71	74
2025	66	70	72	74
2026	66	70	72	75
2027	67	70	73	75
2028	67	70	73	75
2029	79	82	85	87
2030	79	83	85	87
2031	79	83	85	88
2032	80	83	86	88
2033	81	85	87	90
2034	81	85	87	90
2035	82	85	88	90
2036	82	86	88	91
2037	82	86	88	91
2038	83	86	89	91
2039	85	88	91	93
2040	85	89	91	94
2041	86	89	92	94
2042	86	90	92	95
2043	87	90	93	95
2044	87	91	93	96

Cumberland Valley Electric

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Cumberland Valley Electric, Inc.

EAST KENTUCKY POWER COOPERATIVE

A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Cumberland Valley Electric, located in Gray, Kentucky, is an electric distribution cooperative that serves members in nine counties in Kentucky and two counties in Tennessee. This load forecast report contains Cumberland Valley Electric's long-range forecast of energy and peak demand.

Cumberland Valley Electric and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Cumberland Valley Electric for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Cumberland Valley Electric. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Cumberland Valley Electric. Cooperation helps to ensure that the forecast meets both parties' needs. Cumberland Valley Electric uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Cumberland Valley Electric is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	324,559	84,677	68,978	478,214	658	3.9	498,107
2015	306,953	87,538	57,660	452,151	589	4.3	472,918
2016	306,233	80,393	53,850	440,476	534	4.8	463,420
2017	285,649	75,579	52,018	413,246	473	5.1	436,069
2018	316,052	79,674	53,196	448,922	514	4.5	470,541
2019	303,936	79,686	41,156	424,777	533	3.9	442,563
2020	297,732	66,091	38,626	402,449	478	5.1	424,474
2021	305,243	70,364	40,699	416,306	512	4.3	435,322
2022	310,047	73,886	124,682	508,616	533	4.5	533,412
2023	275,694	78,130	155,956	509,780	452	4.1	531,897
2024	302,251	76,773	159,022	538,046	502	4.4	563,154
2025	303,248	76,533	168,220	548,001	502	4.4	573,564
2026	305,242	76,193	174,352	555,787	502	4.4	581,705
2027	306,266	75,681	174,352	556,299	502	4.4	582,241
2028	307,911	75,391	174,352	557,655	502	4.4	583,658
2029	307,390	74,690	174,352	556,432	502	4.4	582,380
2030	307,962	74,069	183,550	565,581	502	4.4	591,947
2031	308,700	73,531	183,550	565,781	502	4.4	592,156
2032	310,445	73,258	183,550	567,253	502	4.4	593,695
2033	310,222	72,614	183,550	566,386	502	4.4	592,789
2034	311,107	72,200	192,748	576,054	502	4.4	602,899
2035	312,488	71,853	192,748	577,089	502	4.4	603,981
2036	315,030	71,771	192,748	579,550	502	4.4	606,554
2037	315,763	71,384	192,748	579,895	502	4.4	606,915
2038	317,476	71,215	201,946	590,637	502	4.4	618,148
2039	319,457	71,040	201,946	592,443	502	4.4	620,036
2040	322,595	70,933	201,946	595,474	502	4.4	623,205
2041	323,846	70,458	201,946	596,250	502	4.4	624,017
2042	326,410	70,209	211,144	607,763	502	4.4	636,056
2043	329,184	70,036	211,144	610,364	502	4.4	638,776
2044	333,164	70,091	211,144	614,399	502	4.4	642,996

Table 1-1 *(continued)*

Peaks Summary

Winter		Summer					
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	155.6	2014	97.9	2014	498,107	36.5%	-1° F	89° F
2014 - 15	161.1	2015	91.6	2015	472,918	33.5%	-7° F	90° F
2015- 16	125.7	2016	93.4	2016	463,420	42.0%	6° F	94° F
2016 - 17	113.3	2017	87.7	2017	436,069	43.9%	8° F	92° F
2017 - 18	143.3	2018	89.4	2018	470,541	37.5%	0° F	93° F
2018 - 19	120.6	2019	88.5	2019	442,563	41.9%	4° F	91° F
2019 - 20	113.6	2020	91.4	2020	424,474	42.5%	15° F	91° F
2020 - 21	128.6	2021	87.6	2021	435,322	38.6%	24° F	91° F
2021 - 22	120.9	2022	105.4	2022	533,412	50.3%	10° F	95° F
2022 - 23	157.4	2023	109.8	2023	531,897	38.6%	-3° F	92° F
2023 - 24	166.9	2024	115.2	2024	563,154	38.4%	2° F	
2024 - 25	169.7	2025	119.3	2025	573,564	38.6%		
2025 - 26	174.0	2026	119.5	2026	581,705	38.2%		
2026 - 27	174.0	2027	119.5	2027	582,241	38.2%		
2027 - 28	174.4	2028	119.6	2028	583,658	38.1%		
2028 - 29	173.8	2029	119.4	2029	582,380	38.3%		
2029 - 30	175.2	2030	120.9	2030	591,947	38.6%		
2030 - 31	175.1	2031	120.9	2031	592,156	38.6%		
2031 - 32	175.4	2032	121.0	2032	593,695	38.5%		
2032 - 33	175.0	2033	121.0	2033	592,789	38.7%		
2033 - 34	176.5	2034	122.5	2034	602,899	39.0%		
2034 - 35	176.6	2035	122.7	2035	603,981	39.0%		
2035 - 36	177.3	2036	123.1	2036	606,554	39.0%		
2036 - 37	177.1	2037	123.2	2037	606,915	39.1%		
2037 - 38	178.9	2038	125.0	2038	618,148	39.5%		
2038 - 39	179.2	2039	125.3	2039	620,036	39.5%		
2039 - 40	180.0	2040	125.8	2040	623,205	39.5%		
2040 - 41	179.9	2041	126.1	2041	624,017	39.6%		
2041 - 42	181.8	2042	128.0	2042	636,056	39.9%		
2042 - 43	182.3	2043	128.5	2043	638,776	40.0%		
2043 - 44	183.4	2044	129.1	2044	642,996	40.0%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 0.7 percent a year for the period 2024-2044, compared to a 0.4 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.4 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 0.6 percent.

- Load factor increases from 38.6% to 40.0% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Total Sales
5-Year	2018 - 2023	-2.7%	-0.4%	24.0%	2.6%
	2024 - 2029	0.3%	-0.5%	1.9%	0.7%
10-Year	2013 - 2023	-1.3%	-0.4%	8.5%	0.9%
	2024 - 2034	0.3%	-0.6%	1.9%	0.7%
15-Year	2008 - 2023	-1.2%	0.1%	2.4%	-0.1%
	2024 - 2039	0.4%	-0.5%	1.6%	0.6%
20-Year	2003 - 2023	-0.5%	1.3%	2.9%	0.6%
	2024 - 2044	0.5%	-0.5%	1.4%	0.7%

Growth rates shown are Compound Annual Growth Rates.

Narrative

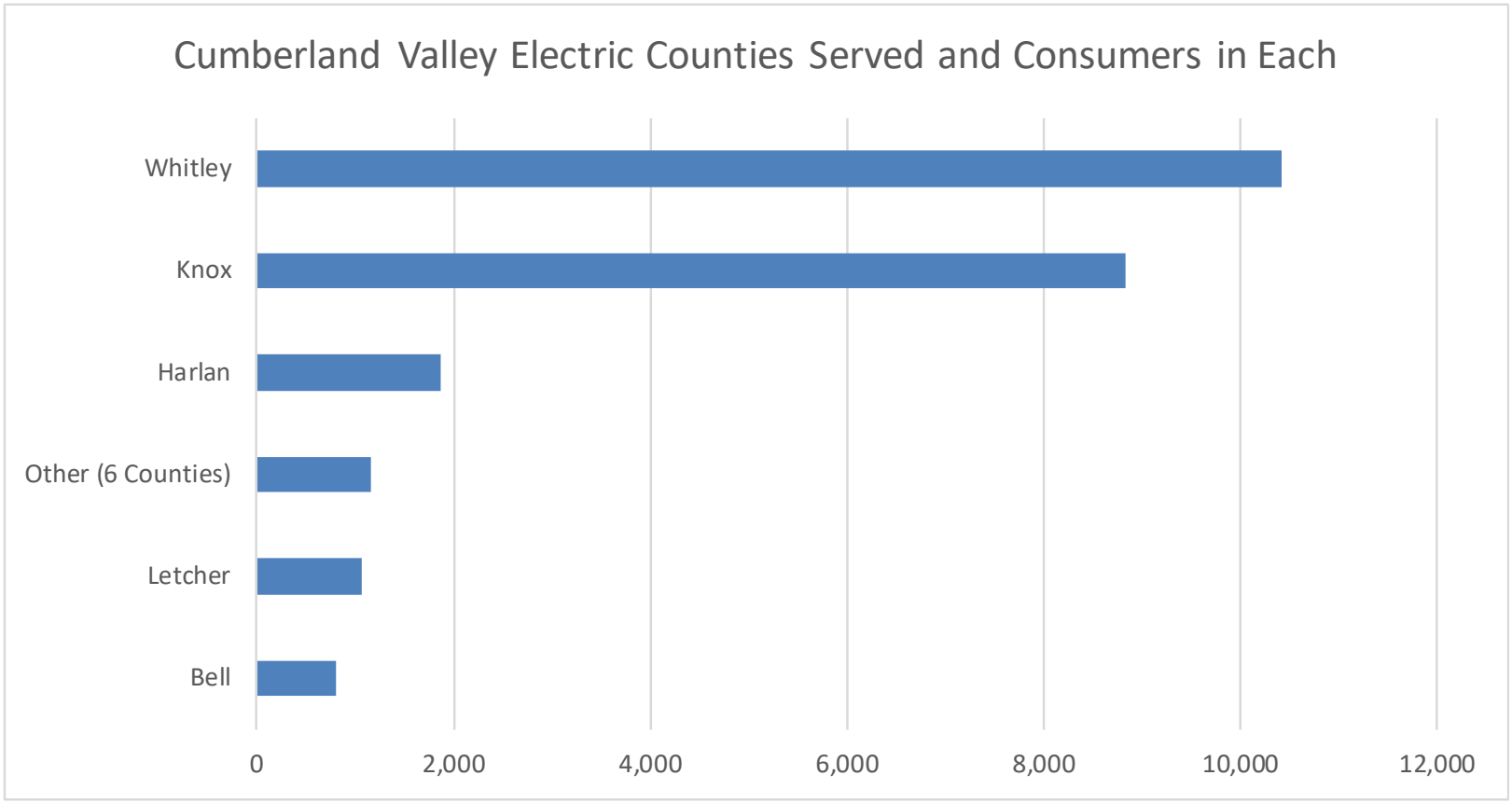
The service area of Cumberland Valley Electric is located in the eastern Kentucky counties of Bell, Clay, Harlan, Knox, Laurel, Leslie, Letcher, McCreary and Whitley. Additionally, Cumberland Valley Electric serves Campbell and Claiborne counties in Tennessee.

The average household has 2.3 people; 78 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

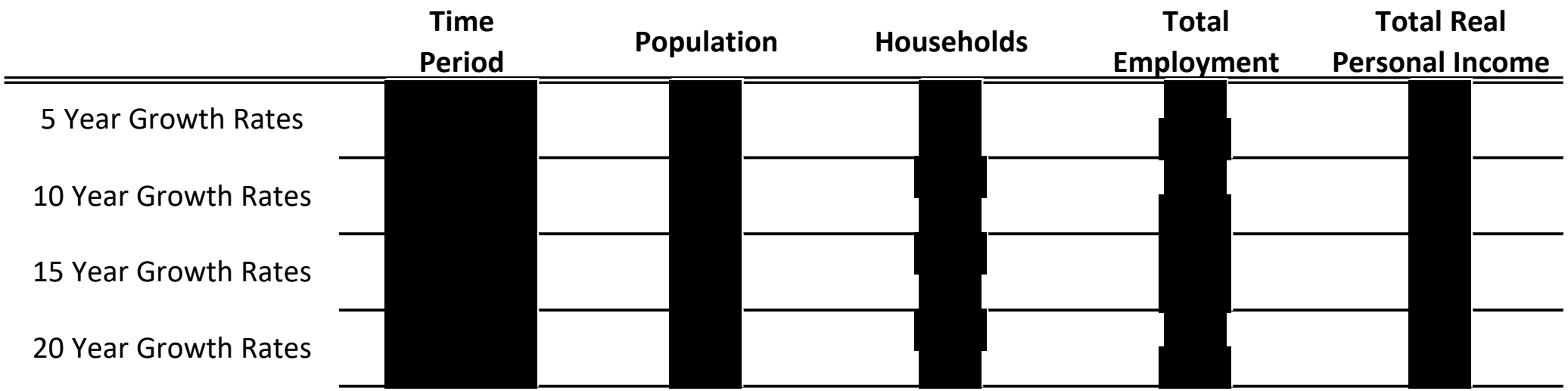
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 60% of consumers use electricity as a primary fuel for heating, while 18% use it as a secondary fuel.
  - 18% use electric furnaces and 38% use electric heat pumps.
- 93% of consumers use electricity for cooling
  - Of those with electric cooling, 86% use central air and 14% use electric window units.
- 84% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*

Weather

- Weather data is from the NWS Jackson weather station at Julian Carroll Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Cumberland Valley Electric as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Cumberland Valley Electric experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Cumberland Valley Electric Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand (MW)	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	498,106,950	1.7%	478,213,942	2.8%	19,234,772	3.9%	155.6	36.5%	23,619	2,639	8.9	$36,454,328	7.3
2015	472,918,391	-5.1%	452,150,592	-5.5%	20,178,951	4.3%	161.1	33.5%	23,586	2,643	8.9	$33,459,526	7.1
2016	463,419,608	-2.0%	440,476,362	-2.6%	22,408,848	4.8%	125.4	42.1%	23,620	2,655	8.9	$31,802,176	6.9
2017	436,068,508	-5.9%	413,246,369	-6.2%	22,349,260	5.1%	115.6	43.1%	23,636	2,666	8.9	$30,052,394	6.9
2018	470,541,365	7.9%	448,922,152	8.6%	21,105,493	4.5%	143.3	37.5%	23,636	2,677	8.8	$31,960,830	6.8
2019	442,563,458	-5.9%	424,777,329	-5.4%	17,252,813	3.9%	120.6	41.9%	23,663	2,685	8.8	$29,927,607	6.8
2020	424,473,573	-4.1%	402,448,989	-5.3%	21,546,214	5.1%	113.6	42.5%	23,835	2,699	8.8	$27,407,445	6.5
2021	435,321,615	2.6%	416,306,219	3.4%	18,502,919	4.3%	128.6	38.6%	23,976	2,711	8.8	$31,620,303	7.3
2022	533,412,029	22.5%	508,616,013	22.2%	24,263,034	4.5%	154.1	39.5%	24,047	2,723	8.8	$45,370,514	8.5
2023	531,897,170	-0.3%	509,779,907	0.2%	21,664,955	4.1%	126.1	48.1%	24,131	2,738	8.8	$43,384,255	8.2
5 Year Average (2019-2023)						4.4%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Cumberland Valley Electric staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Cumberland Valley Electric staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Cumberland Valley Electric's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Cumberland Valley Electric's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	22,024	-63	-0.3	1,228	40	3.4	324,559	9,710	3.1
2015	21,982	-42	-0.2	1,164	-64	-5.2	306,953	-17,606	-5.4
2016	22,031	49	0.2	1,158	-5	-0.5	306,233	-720	-0.2
2017	22,047	16	0.1	1,080	-79	-6.8	285,649	-20,584	-6.7
2018	22,049	2	0.0	1,195	115	10.6	316,052	30,404	10.6
2019	22,050	1	0.0	1,149	-46	-3.8	303,936	-12,116	-3.8
2020	22,211	161	0.7	1,117	-32	-2.8	297,732	-6,204	-2.0
2021	22,338	127	0.6	1,139	22	1.9	305,243	7,512	2.5
2022	22,376	38	0.2	1,155	16	1.4	310,047	4,804	1.6
2023	22,425	49	0.2	1,025	-130	-11.3	275,694	-34,354	-11.1
2024	22,473	48	0.2	1,121	96	9.4	302,251	26,557	9.6
2025	22,514	41	0.2	1,122	2	0.2	303,248	997	0.3
2026	22,545	31	0.1	1,128	6	0.5	305,242	1,994	0.7
2027	22,584	39	0.2	1,130	2	0.2	306,266	1,024	0.3
2028	22,626	42	0.2	1,134	4	0.4	307,911	1,645	0.5
2029	22,667	41	0.2	1,130	-4	-0.3	307,390	-521	-0.2
2030	22,708	41	0.2	1,130	0	0.0	307,962	572	0.2
2031	22,748	40	0.2	1,131	1	0.1	308,700	738	0.2
2032	22,787	39	0.2	1,135	4	0.4	310,445	1,745	0.6
2033	22,828	41	0.2	1,132	-3	-0.2	310,222	-223	-0.1
2034	22,870	42	0.2	1,134	1	0.1	311,107	884	0.3
2035	22,912	42	0.2	1,137	3	0.3	312,488	1,382	0.4
2036	22,954	42	0.2	1,144	7	0.6	315,030	2,542	0.8
2037	22,997	43	0.2	1,144	1	0.0	315,763	733	0.2
2038	23,043	46	0.2	1,148	4	0.3	317,476	1,713	0.5
2039	23,093	50	0.2	1,153	5	0.4	319,457	1,981	0.6
2040	23,145	52	0.2	1,162	9	0.8	322,595	3,138	1.0
2041	23,198	53	0.2	1,163	2	0.2	323,846	1,251	0.4
2042	23,253	55	0.2	1,170	6	0.6	326,410	2,564	0.8
2043	23,307	54	0.2	1,177	7	0.6	329,184	2,774	0.8
2044	23,364	57	0.2	1,188	11	1.0	333,164	3,980	1.2

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,580	24	1.5	54	1	2.1	84,677	2,976	3.6
2015	1,589	9	0.6	55	1	2.8	87,538	2,861	3.4
2016	1,578	-11	-0.7	51	-4	-7.5	80,393	-7,145	-8.2
2017	1,578	0	0.0	48	-3	-6.0	75,579	-4,814	-6.0
2018	1,576	-2	-0.1	51	3	5.6	79,674	4,094	5.4
2019	1,603	27	1.7	50	-1	-1.7	79,686	12	0.0
2020	1,613	10	0.6	41	-9	-17.6	66,091	-13,594	-17.1
2021	1,628	15	0.9	43	2	5.5	70,364	4,273	6.5
2022	1,660	32	2.0	45	1	3.0	73,886	3,522	5.0
2023	1,694	34	2.0	46	2	3.6	78,130	4,244	5.7
2024	1,711	17	1.0	45	-1	-2.7	76,773	-1,357	-1.7
2025	1,719	8	0.5	45	0	-0.8	76,533	-240	-0.3
2026	1,724	5	0.3	44	0	-0.7	76,193	-341	-0.4
2027	1,727	3	0.2	44	0	-0.9	75,681	-512	-0.7
2028	1,730	3	0.2	44	0	-0.5	75,391	-290	-0.4
2029	1,729	-1	-0.1	43	0	-0.9	74,690	-702	-0.9
2030	1,729	0	0.0	43	0	-0.8	74,069	-621	-0.8
2031	1,727	-2	-0.1	43	0	-0.6	73,531	-538	-0.7
2032	1,725	-2	-0.1	42	0	-0.3	73,258	-273	-0.4
2033	1,725	0	0.0	42	0	-0.8	72,614	-644	-0.9
2034	1,724	-1	-0.1	42	0	-0.5	72,200	-414	-0.6
2035	1,723	-1	-0.1	42	0	-0.4	71,853	-347	-0.5
2036	1,722	-1	-0.1	42	0	-0.1	71,771	-82	-0.1
2037	1,723	1	0.1	41	0	-0.6	71,384	-387	-0.5
2038	1,723	0	0.0	41	0	-0.3	71,215	-169	-0.2
2039	1,724	1	0.1	41	0	-0.2	71,040	-176	-0.2
2040	1,724	0	0.0	41	0	-0.2	70,933	-107	-0.2
2041	1,724	0	0.0	41	0	-0.6	70,458	-475	-0.7
2042	1,723	-1	-0.1	41	0	-0.3	70,209	-249	-0.4
2043	1,722	-1	-0.1	41	0	-0.2	70,036	-173	-0.2
2044	1,722	0	0.0	41	0	0.1	70,091	56	0.1

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Cumberland Valley Electric had 12 consumers in this class and consumers are projected to increase to 18 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	15	-1	-6.3	4,599	305	7.1	68,978	289	0.4
2015	15	0	0.0	3,844	-755	-16.4	57,660	-11,319	-16.4
2016	11	-4	-26.7	4,895	1,051	27.4	53,850	-3,810	-6.6
2017	11	0	0.0	4,729	-167	-3.4	52,018	-1,832	-3.4
2018	11	0	0.0	4,836	107	2.3	53,196	1,178	2.3
2019	10	-1	-9.1	4,116	-720	-14.9	41,156	-12,040	-22.6
2020	11	1	10.0	3,511	-604	-14.7	38,626	-2,530	-6.1
2021	10	-1	-9.1	4,070	558	15.9	40,699	2,073	5.4
2022	11	1	10.0	11,335	7,265	178.5	124,682	83,983	206.4
2023	12	1	9.1	12,996	1,662	14.7	155,956	31,274	25.1
2024	13	1	8.3	12,722	-275	-2.1	159,022	3,066	2.0
2025	14	1	7.7	12,461	-261	-2.1	168,220	9,198	5.8
2026	14	0	0.0	12,454	-7	-0.1	174,352	6,132	3.6
2027	14	0	0.0	12,454	0	0.0	174,352	0	0.0
2028	14	0	0.0	12,454	0	0.0	174,352	0	0.0
2029	14	0	0.0	12,454	0	0.0	174,352	0	0.0
2030	15	1	7.1	12,237	-217	-1.7	183,550	9,198	5.3
2031	15	0	0.0	12,237	0	0.0	183,550	0	0.0
2032	15	0	0.0	12,237	0	0.0	183,550	0	0.0
2033	15	0	0.0	12,237	0	0.0	183,550	0	0.0
2034	16	1	6.7	12,047	-190	-1.6	192,748	9,198	5.0
2035	16	0	0.0	12,047	0	0.0	192,748	0	0.0
2036	16	0	0.0	12,047	0	0.0	192,748	0	0.0
2037	16	0	0.0	12,047	0	0.0	192,748	0	0.0
2038	17	1	6.3	11,879	-168	-1.4	201,946	9,198	4.8
2039	17	0	0.0	11,879	0	0.0	201,946	0	0.0
2040	17	0	0.0	11,879	0	0.0	201,946	0	0.0
2041	17	0	0.0	11,879	0	0.0	201,946	0	0.0
2042	18	1	5.9	11,730	-149	-1.3	211,144	9,198	4.6
2043	18	0	0.0	11,730	0	0.0	211,144	0	0.0
2044	18	0	0.0	11,730	0	0.0	211,144	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Cumberland Valley Electric's peak demands. Table 1-8 reports the impact of extreme temperature on system demands.

Table 1-8: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		**Extreme**	
Degrees	1	-7	-10	-15
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	170	179	183	189
2025 - 26	174	184	187	193
2026 - 27	174	184	187	194
2027 - 28	174	184	188	194
2028 - 29	174	184	187	193
2029 - 30	175	185	189	195
2030 - 31	175	185	189	195
2031 - 32	175	185	189	195
2032 - 33	175	185	189	195
2033 - 34	176	186	190	196
2034 - 35	177	187	190	196
2035 - 36	177	187	191	197
2036 - 37	177	187	191	197
2037 - 38	179	189	193	199
2038 - 39	179	189	193	199
2039 - 40	180	190	194	200
2040 - 41	180	190	194	200
2041 - 42	182	192	196	202
2042 - 43	182	192	196	203
2043 - 44	183	193	197	204

Summer Peak Day Maximum Temperatures				
	Normal		**Extreme**	
Degrees	94	97	99	101
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	115	120	123	127
2025	119	124	127	131
2026	120	124	128	131
2027	120	124	128	131
2028	120	124	128	131
2029	119	124	128	131
2030	121	126	129	132
2031	121	126	129	132
2032	121	126	129	133
2033	121	126	129	133
2034	123	127	131	134
2035	123	128	131	134
2036	123	128	131	135
2037	123	128	132	135
2038	125	130	133	137
2039	125	130	134	137
2040	126	131	134	138
2041	126	131	134	138
2042	128	133	136	140
2043	128	133	137	140
2044	129	134	138	141

Big Sandy Rural Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Big Sandy RECC
A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE
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Introduction

Executive Summary

Big Sandy Rural Electric Cooperative Corporation (Big Sandy RECC), located in Paintsville, Kentucky, is an electric distribution cooperative that serves members in seven counties in Kentucky. This load forecast report contains Big Sandy RECC's long-range forecast of energy and peak demand.

Big Sandy RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Big Sandy RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Big Sandy RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Big Sandy RECC. Cooperation helps to ensure that the forecast meets both parties' needs. Big Sandy RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Big Sandy RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	180,609	57,576	6,163	244,348	0	5.7	259,080
2015	170,067	51,323	6,245	227,635	0	5.7	241,377
2016	168,118	48,236	6,165	222,519	0	5.6	235,603
2017	155,202	46,788	6,113	208,103	0	5.6	220,560
2018	171,979	47,615	6,185	225,779	0	5.5	238,929
2019	161,822	47,154	6,066	215,043	0	5.5	227,583
2020	160,222	42,724	6,376	209,322	0	5.5	221,435
2021	160,320	43,600	6,412	210,332	0	5.1	221,726
2022	164,357	45,026	6,399	215,782	0	5.5	228,320
2023	145,961	42,341	6,782	195,085	24	5.8	207,212
2024	156,633	46,259	43,675	246,567	48	4.5	258,129
2025	157,000	46,040	117,158	320,198	48	3.5	331,769
2026	158,127	45,698	117,158	320,984	48	3.5	332,598
2027	158,906	45,304	117,158	321,368	48	3.5	333,003
2028	160,030	45,064	117,158	322,252	48	3.5	333,936
2029	159,894	44,595	117,158	321,648	48	3.5	333,298
2030	160,385	44,243	117,158	321,787	48	3.5	333,445
2031	160,960	43,942	117,158	322,061	48	3.5	333,734
2032	162,148	43,854	117,158	323,160	48	3.5	334,894
2033	162,272	43,536	117,158	322,966	48	3.5	334,689
2034	163,031	43,366	117,158	323,556	48	3.5	335,310
2035	164,031	43,247	117,158	324,437	48	3.5	336,240
2036	165,702	43,310	117,158	326,171	48	3.5	338,069
2037	166,387	43,164	117,158	326,710	48	3.5	338,638
2038	167,599	43,163	117,158	327,921	48	3.5	339,916
2039	168,957	43,175	117,158	329,290	48	3.5	341,360
2040	170,982	43,237	117,158	331,377	48	3.5	343,561
2041	171,899	43,060	117,158	332,117	48	3.5	344,342
2042	173,580	43,051	117,158	333,789	48	3.5	346,106
2043	175,398	43,097	117,158	335,653	48	3.6	348,073
2044	177,897	43,306	117,158	338,362	48	3.6	350,930

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*					
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	85.7	2014	46.5	2014	259,080	34.5%	-1° F	89° F
2014 - 15	90.8	2015	46.4	2015	241,377	30.3%	-7° F	90° F
2015- 16	66.1	2016	46.8	2016	235,603	40.6%	6° F	94° F
2016 - 17	60.2	2017	46.2	2017	220,560	41.8%	8° F	92° F
2017 - 18	75.3	2018	46.6	2018	238,929	36.2%	0° F	93° F
2018 - 19	67.7	2019	45.6	2019	227,583	38.4%	4° F	91° F
2019 - 20	59.5	2020	46.6	2020	221,435	42.3%	15° F	93° F
2020 - 21	67.1	2021	45.3	2021	221,726	37.7%	24° F	92° F
2021 - 22	65.1	2022	45.8	2022	228,320	40.0%	10° F	95° F
2022 - 23	75.2	2023	43.9	2023	207,212	31.4%	-3° F	92° F
2023 - 24	73.1	2024	46.9	2024	258,129	40.2%	2° F	
2024 - 25	87.1	2025	60.9	2025	331,769	43.5%		
2025 - 26	87.0	2026	60.8	2026	332,598	43.7%		
2026 - 27	86.7	2027	60.7	2027	333,003	43.8%		
2027 - 28	86.7	2028	60.6	2028	333,936	43.8%		
2028 - 29	86.2	2029	60.4	2029	333,298	44.1%		
2029 - 30	86.0	2030	60.2	2030	333,445	44.3%		
2030 - 31	85.8	2031	60.1	2031	333,734	44.4%		
2031 - 32	85.8	2032	60.2	2032	334,894	44.4%		
2032 - 33	85.5	2033	60.0	2033	334,689	44.7%		
2033 - 34	85.3	2034	60.0	2034	335,310	44.9%		
2034 - 35	85.3	2035	60.0	2035	336,240	45.0%		
2035 - 36	85.5	2036	60.1	2036	338,069	45.0%		
2036 - 37	85.3	2037	60.1	2037	338,638	45.3%		
2037 - 38	85.3	2038	60.2	2038	339,916	45.5%		
2038 - 39	85.3	2039	60.3	2039	341,360	45.7%		
2039 - 40	85.6	2040	60.5	2040	343,561	45.7%		
2040 - 41	85.4	2041	60.5	2041	344,342	46.0%		
2041 - 42	85.5	2042	60.6	2042	346,106	46.2%		
2042 - 43	85.6	2043	60.8	2043	348,073	46.4%		
2043 - 44	86.0	2044	61.1	2044	350,930	46.6%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.6 percent a year for the period 2024-2044, compared to a 0.3 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to decrease 0.1 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.3 percent*.

- Load factor increases from 43.5% to 46.6% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather

**Note that large summer peak demand growth is driven by the addition of a new large commercial consumer whose contribution to summer peak begins in 2025.*

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Total Sales
5-Year	2018 - 2023	-3.2%	-2.3%	1.9%	-2.9%
	2024 - 2029	0.4%	-0.7%	21.8%	5.5%
10-Year	2013 - 2023	-2.0%	-3.3%	0.8%	-2.2%
	2024 - 2034	0.4%	-0.6%	10.4%	2.8%
15-Year	2008 - 2023	-1.8%	-3.2%	-1.4%	-2.1%
	2024 - 2039	0.5%	-0.5%	6.8%	1.9%
20-Year	2003 - 2023	-0.9%	-2.8%	0.0%	-1.4%
	2024 - 2044	0.6%	-0.3%	5.1%	1.6%

Growth rates shown are Compound Annual Growth Rates.

Narrative

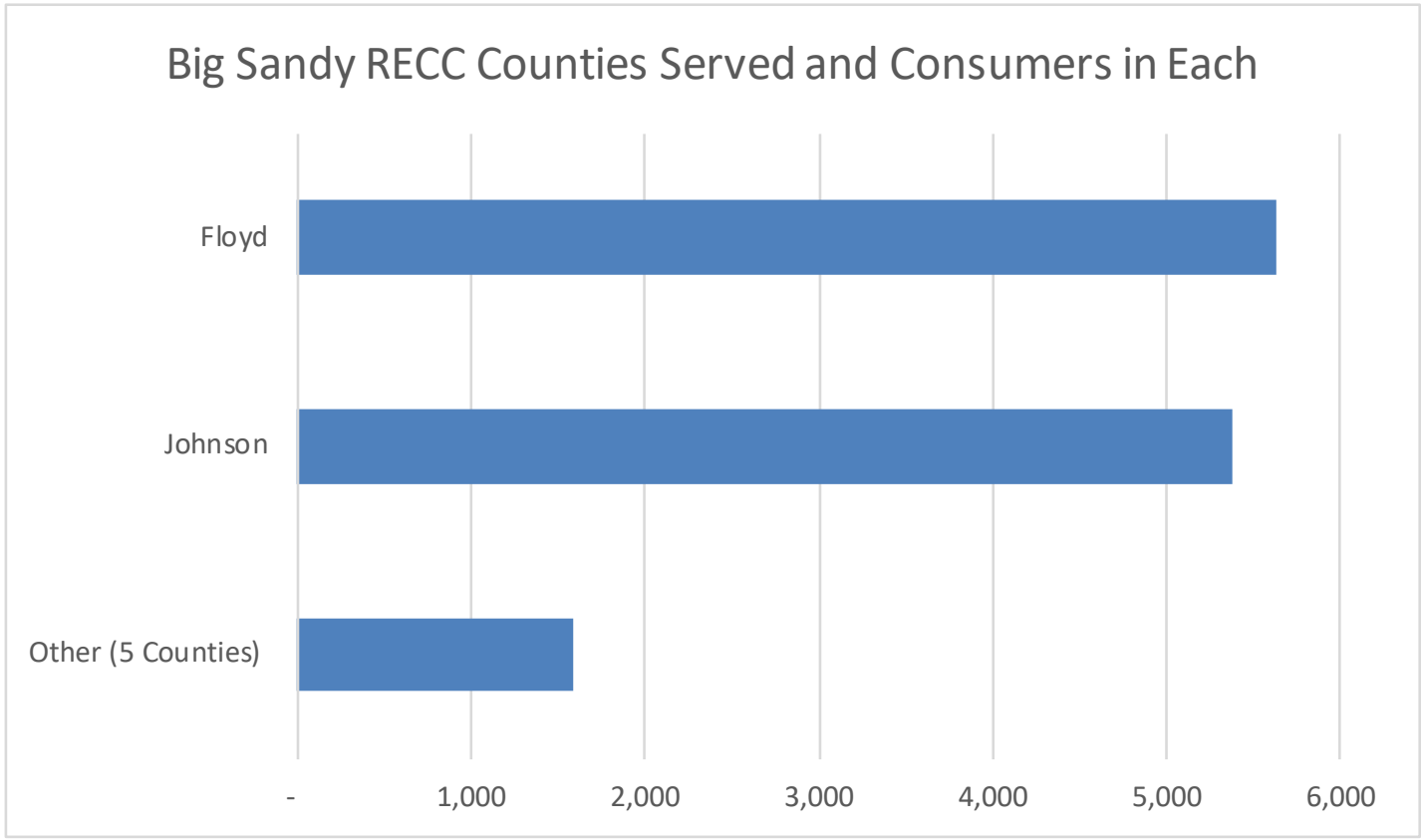
Population trends of the area indicate slight decreases in the next 20 years. The bulk of the population resides in the rural areas and Big Sandy RECC should receive its share of future services. See Figure 1-1 for a graph showing members served by county.

The average household contains 2.1 people and approximately 78 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3

Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 59% of consumers use electricity as a primary fuel for heating, while 27% use it as a secondary fuel.
  - 20% use electric furnaces and 37% use electric heat pumps.
- 95% of consumers use electricity for cooling
  - Of those with electric cooling, 84% use central air and 16% use electric window units.
- 80% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the JKL weather station at Julian Carroll Airport in Jackson, KY.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Big Sandy RECC as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Big Sandy RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Big Sandy RECC Comparative Annual Operating Data

Year	kWh Purchased and Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Peak Demand (MW)	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	259,080,265	-0.1%	244,347,739	0.1%	14,732,526	5.7%	82.8	35.7%	13,102	1,034	12.7	$19,111,224	7.4
2015	241,376,801	-6.8%	227,634,942	-6.8%	13,741,859	5.7%	89.6	30.7%	13,053	1,037	12.6	$17,190,536	7.1
2016	235,603,266	-2.4%	222,519,388	-2.2%	13,083,878	5.6%	65.0	41.3%	12,987	1,038	12.5	$16,239,864	6.9
2017	220,559,577	-6.4%	208,102,946	-6.5%	12,456,631	5.6%	58.7	42.9%	12,939	1,037	12.5	$15,297,334	6.9
2018	238,928,865	8.3%	225,779,190	8.5%	13,149,675	5.5%	74.4	36.6%	12,866	1,035	12.4	$16,283,925	6.8
2019	227,582,952	-4.7%	215,042,606	-4.8%	12,540,346	5.5%	67.4	38.5%	12,759	1,036	12.3	$15,515,672	6.8
2020	221,434,694	-2.7%	209,321,929	-2.7%	12,112,765	5.5%	59.0	42.7%	12,789	1,036	12.3	$14,289,675	6.5
2021	221,725,936	0.1%	210,331,589	0.5%	11,394,347	5.1%	51.1	49.6%	12,837	1,034	12.4	$16,128,723	7.3
2022	228,320,154	3.0%	215,782,084	2.6%	12,538,070	5.5%	74.4	35.1%	12,763	1,031	12.4	$20,333,030	8.9
2023	207,211,745	-9.2%	195,084,645	-9.6%	12,103,065	5.8%	54.9	43.1%	12,636	1,034	12.2	$17,827,633	8.6
5 Year Average (2019-2023)						5.5%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Big Sandy RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Big Sandy RECC staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Big Sandy RECC's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Big Sandy RECC's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	12,015	-65	-0.5	1,253	20	1.6	180,609	1,966	1.1
2015	11,960	-55	-0.5	1,185	-68	-5.4	170,067	-10,541	-5.8
2016	11,893	-67	-0.6	1,178	-7	-0.6	168,118	-1,949	-1.1
2017	11,848	-45	-0.4	1,092	-86	-7.3	155,202	-12,916	-7.7
2018	11,796	-52	-0.4	1,215	123	11.3	171,979	16,777	10.8
2019	11,705	-91	-0.8	1,152	-63	-5.2	161,822	-10,157	-5.9
2020	11,738	33	0.3	1,137	-15	-1.3	160,222	-1,600	-1.0
2021	11,780	42	0.4	1,134	-3	-0.3	160,320	98	0.1
2022	11,712	-68	-0.6	1,169	35	3.1	164,357	4,037	2.5
2023	11,593	-119	-1.0	1,049	-120	-10.3	145,961	-18,396	-11.2
2024	11,618	25	0.2	1,123	74	7.1	156,633	10,672	7.3
2025	11,643	25	0.2	1,124	0	0.0	157,000	367	0.2
2026	11,668	25	0.2	1,129	6	0.5	158,127	1,127	0.7
2027	11,693	25	0.2	1,132	3	0.3	158,906	779	0.5
2028	11,718	25	0.2	1,138	6	0.5	160,030	1,125	0.7
2029	11,743	25	0.2	1,135	-3	-0.3	159,894	-137	-0.1
2030	11,768	25	0.2	1,136	1	0.1	160,385	492	0.3
2031	11,793	25	0.2	1,137	2	0.1	160,960	575	0.4
2032	11,818	25	0.2	1,143	6	0.5	162,148	1,188	0.7
2033	11,843	25	0.2	1,142	-2	-0.1	162,272	124	0.1
2034	11,868	25	0.2	1,145	3	0.3	163,031	758	0.5
2035	11,893	25	0.2	1,149	5	0.4	164,031	1,000	0.6
2036	11,918	25	0.2	1,159	9	0.8	165,702	1,671	1.0
2037	11,943	25	0.2	1,161	2	0.2	166,387	685	0.4
2038	11,968	25	0.2	1,167	6	0.5	167,599	1,212	0.7
2039	11,993	25	0.2	1,174	7	0.6	168,957	1,358	0.8
2040	12,018	25	0.2	1,186	12	1.0	170,982	2,025	1.2
2041	12,043	25	0.2	1,189	4	0.3	171,899	917	0.5
2042	12,068	25	0.2	1,199	9	0.8	173,580	1,681	1.0
2043	12,093	25	0.2	1,209	10	0.8	175,398	1,818	1.0
2044	12,118	25	0.2	1,223	15	1.2	177,897	2,500	1.4

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6
Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,086	-10	-0.9	53	-1	-1.7	57,576	-1,550	-2.6
2015	1,092	6	0.6	47	-6	-11.4	51,323	-6,253	-10.9
2016	1,093	1	0.1	44	-3	-6.1	48,236	-3,086	-6.0
2017	1,090	-3	-0.3	43	-1	-2.7	46,788	-1,448	-3.0
2018	1,069	-21	-1.9	45	2	3.8	47,615	827	1.8
2019	1,053	-16	-1.5	45	0	0.5	47,154	-461	-1.0
2020	1,050	-3	-0.3	41	-4	-9.1	42,724	-4,430	-9.4
2021	1,056	6	0.6	41	1	1.5	43,600	876	2.1
2022	1,050	-6	-0.6	43	2	3.9	45,026	1,426	3.3
2023	1,042	-8	-0.8	41	-2	-5.2	42,341	-2,685	-6.0
2024	1,043	1	0.1	44	4	9.1	46,259	3,918	9.3
2025	1,044	1	0.1	44	0	-0.6	46,040	-219	-0.5
2026	1,045	1	0.1	44	0	-0.8	45,698	-342	-0.7
2027	1,046	1	0.1	43	0	-1.0	45,304	-395	-0.9
2028	1,047	1	0.1	43	0	-0.6	45,064	-240	-0.5
2029	1,048	1	0.1	43	0	-1.1	44,595	-468	-1.0
2030	1,049	1	0.1	42	0	-0.9	44,243	-352	-0.8
2031	1,050	1	0.1	42	0	-0.8	43,942	-301	-0.7
2032	1,051	1	0.1	42	0	-0.3	43,854	-89	-0.2
2033	1,052	1	0.1	41	0	-0.8	43,536	-318	-0.7
2034	1,053	1	0.1	41	0	-0.5	43,366	-169	-0.4
2035	1,054	1	0.1	41	0	-0.4	43,247	-119	-0.3
2036	1,055	1	0.1	41	0	0.1	43,310	63	0.1
2037	1,056	1	0.1	41	0	-0.4	43,164	-146	-0.3
2038	1,057	1	0.1	41	0	-0.1	43,163	-1	0.0
2039	1,058	1	0.1	41	0	-0.1	43,175	11	0.0
2040	1,059	1	0.1	41	0	0.0	43,237	62	0.1
2041	1,060	1	0.1	41	0	-0.5	43,060	-176	-0.4
2042	1,061	1	0.1	41	0	-0.1	43,051	-10	0.0
2043	1,062	1	0.1	41	0	0.0	43,097	47	0.1
2044	1,063	1	0.1	41	0	0.4	43,306	209	0.5

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Big Sandy RECC had 1 consumer in this class and consumers are projected to increase to 2 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1	0	0.0	6,163	-123	-2.0	6,163	-123	-2.0
2015	1	0	0.0	6,245	82	1.3	6,245	82	1.3
2016	1	0	0.0	6,165	-80	-1.3	6,165	-80	-1.3
2017	1	0	0.0	6,113	-52	-0.8	6,113	-52	-0.8
2018	1	0	0.0	6,185	72	1.2	6,185	72	1.2
2019	1	0	0.0	6,066	-119	-1.9	6,066	-119	-1.9
2020	1	0	0.0	6,376	310	5.1	6,376	310	5.1
2021	1	0	0.0	6,412	35	0.6	6,412	35	0.6
2022	1	0	0.0	6,399	-12	-0.2	6,399	-12	-0.2
2023	1	0	0.0	6,782	383	6.0	6,782	383	6.0
2024	1	0	0.0	43,675	36,893	543.9	43,675	36,893	543.9
2025	2	1	100.0	58,579	14,904	34.1	117,158	73,483	168.2
2026	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2027	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2028	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2029	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2030	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2031	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2032	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2033	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2034	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2035	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2036	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2037	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2038	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2039	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2040	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2041	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2042	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2043	2	0	0.0	58,579	0	0.0	117,158	0	0.0
2044	2	0	0.0	58,579	0	0.0	117,158	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Big Sandy RECC's peak demands.

Table 1-8 reports the impact of extreme temperature on system demands.

Table 1-8: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal	**Extreme**		
Degrees	1	-7	-10	-15
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Ev	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Winter Peak Demand - MW				
Season	Normal	Extreme		
2024 - 25	87	92	94	98
2025 - 26	87	92	94	98
2026 - 27	87	92	94	98
2027 - 28	87	92	94	98
2028 - 29	86	92	94	97
2029 - 30	86	91	93	97
2030 - 31	86	91	93	97
2031 - 32	86	91	93	97
2032 - 33	85	91	93	96
2033 - 34	85	91	93	96
2034 - 35	85	91	93	96
2035 - 36	85	91	93	97
2036 - 37	85	91	93	96
2037 - 38	85	91	93	96
2038 - 39	85	91	93	96
2039 - 40	86	91	93	97
2040 - 41	85	91	93	97
2041 - 42	85	91	93	97
2042 - 43	86	91	93	97
2043 - 44	86	92	94	97

Summer Peak Day Maximum Temperatures				
	Normal	**Extreme**		
	94	97	99	101
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Non-Coincident Summer Peak Demand - MW				
Year	Normal	Extreme		
2024	47	50	52	54
2025	61	64	66	68
2026	61	64	66	68
2027	61	64	66	68
2028	61	64	66	68
2029	60	63	66	68
2030	60	63	65	68
2031	60	63	65	67
2032	60	63	65	68
2033	60	63	65	67
2034	60	63	65	67
2035	60	63	65	67
2036	60	63	65	68
2037	60	63	65	68
2038	60	63	66	68
2039	60	63	66	68
2040	60	64	66	68
2041	60	64	66	68
2042	61	64	66	68
2043	61	64	66	68
2044	61	64	67	69

Grayson Rural Electric Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Grayson Rural Electric

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Introduction

Executive Summary

Grayson Rural Electric Cooperative Corporation (Grayson RECC), located in Grayson, Kentucky, is an electric distribution cooperative that serves members in six counties in Kentucky. This load forecast report contains Grayson RECC's long-range forecast of energy and peak demand.

Grayson RECC and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Grayson RECC for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Grayson RECC. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Grayson RECC. Cooperation helps to ensure that the forecast meets both parties' needs. Grayson RECC uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Grayson RECC is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street / Highway Lighting Sales (MWh)	Total Sales (MWh)	% Loss	Purchased Power (MWh)
2014	180,714	44,930	29,123	51	254,818	5.7	270,187
2015	171,911	44,957	31,012	51	247,931	5.8	263,079
2016	169,779	44,032	31,215	50	245,077	6.4	261,944
2017	150,817	41,449	31,053	44	223,363	11.0	250,858
2018	177,905	47,566	30,367	47	255,884	5.3	270,302
2019	170,095	46,500	29,821	44	246,459	5.1	259,793
2020	167,386	43,590	29,303	43	240,323	5.3	253,720
2021	166,627	46,306	30,632	39	243,604	5.2	256,945
2022	172,197	46,516	79,235	36	297,985	3.8	309,613
2023	157,443	45,236	98,272	35	300,986	3.3	311,309
2024	168,182	47,090	83,259	35	298,566	4.9	313,848
2025	170,335	47,007	30,634	35	248,011	4.9	260,706
2026	172,632	46,899	30,634	35	250,199	4.9	263,006
2027	174,420	46,744	30,634	35	251,832	4.9	264,722
2028	176,291	46,753	30,634	35	253,712	4.9	266,698
2029	176,691	46,486	34,400	35	257,612	4.9	270,798
2030	177,801	46,255	34,400	35	258,491	4.9	271,722
2031	179,006	46,081	34,400	35	259,521	4.9	272,805
2032	180,925	46,112	34,400	35	261,471	4.9	274,855
2033	181,535	45,912	34,400	35	261,882	4.9	275,286
2034	182,880	45,853	34,400	35	263,168	4.9	276,638
2035	184,562	45,823	34,400	35	264,820	4.9	278,375
2036	186,927	45,955	34,400	35	267,316	4.9	280,999
2037	188,101	45,879	34,400	35	268,415	4.9	282,154
2038	189,833	45,950	34,400	35	270,218	4.9	284,049
2039	191,698	46,024	34,400	35	272,157	4.9	286,088
2040	194,305	46,149	34,400	35	274,889	4.9	288,960
2041	195,624	46,039	34,400	35	276,098	4.9	290,231
2042	197,845	46,069	34,400	35	278,349	4.9	292,597
2043	200,204	46,137	34,400	35	280,776	4.9	295,148
2044	203,324	46,350	34,400	35	284,109	4.9	298,651

Table 1-1 *(continued)*

Peaks Summary

	Winter		*Summer*				
Season	Non-Coincident Peak Demand (MW)	Year	Non-Coincident Peak Demand (MW)	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	81.7	2014	51.2	2014	270,187	37.7%	-4° F	93° F
2014 - 15	86.0	2015	52.3	2015	263,079	34.9%	-16° F	93° F
2015 - 16	65.5	2016	53.9	2016	261,944	45.5%	0° F	95° F
2016 - 17	60.6	2017	52.3	2017	250,858	47.3%	8° F	92° F
2017 - 18	74.5	2018	54.7	2018	270,302	41.4%	-1° F	93° F
2018 - 19	72.6	2019	53.4	2019	259,793	40.8%	6° F	91° F
2019 - 20	58.5	2020	53.7	2020	253,720	49.4%	15° F	91° F
2020 - 21	63.7	2021	53.9	2021	256,945	46.0%	10° F	93° F
2021 - 22	71.6	2022	59.7	2022	309,613	49.4%	7° F	95° F
2022 - 23	87.1	2023	60.9	2023	311,309	40.8%	-2° F	93° F
2023 - 24	77.3	2024	63.3	2024	313,848	46.2%	6° F	
2024 - 25	73.0	2025	54.8	2025	260,706	40.8%		
2025 - 26	73.4	2026	55.1	2026	263,006	40.9%		
2026 - 27	73.7	2027	55.3	2027	264,722	41.0%		
2027 - 28	74.2	2028	55.6	2028	266,698	40.9%		
2028 - 29	75.1	2029	56.7	2029	270,798	41.2%		
2029 - 30	75.2	2030	56.8	2030	271,722	41.2%		
2030 - 31	75.4	2031	57.0	2031	272,805	41.3%		
2031 - 32	75.9	2032	57.4	2032	274,855	41.3%		
2032 - 33	75.8	2033	57.5	2033	275,286	41.4%		
2033 - 34	76.1	2034	57.8	2034	276,638	41.5%		
2034 - 35	76.4	2035	58.1	2035	278,375	41.6%		
2035 - 36	77.0	2036	58.6	2036	280,999	41.5%		
2036 - 37	77.2	2037	58.9	2037	282,154	41.7%		
2037 - 38	77.6	2038	59.3	2038	284,049	41.8%		
2038 - 39	78.0	2039	59.7	2039	286,088	41.9%		
2039 - 40	78.6	2040	60.2	2040	288,960	41.9%		
2040 - 41	78.8	2041	60.5	2041	290,231	42.0%		
2041 - 42	79.2	2042	61.0	2042	292,597	42.0%		
2042 - 43	79.7	2043	61.5	2043	295,148	42.1%		
2043 - 44	80.5	2044	62.2	2044	298,651	42.2%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to increase by 0.7 percent a year for the period 2025-2044.* Sales were projected to grow 0.6 percent annually in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.5 percent a year over the forecast period. Summer peak demands for 2025 to 2044* period indicate a growth rate of 0.7 percent.

- Load factor increases from 40.8% to 42.2% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

**Note that the growth rates for sales and summer peak demand exclude 2024 because a reduction in sales and summer demand is projected from 2024 to 2025 due a large commercial consumer ceasing operations during 2024. Outside of this one-time reduction, sales and demand are projected to increase.*

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street / Highway Lighting	Total Sales
5-Year	2018-2023	-2.4%	-1.0%	26.5%	-5.4%	3.3%
	2024-2029	1.0%	-0.3%	-16.2%	0.0%	-2.9%
10-Year	2013-2023	-1.5%	0.0%	12.8%	-3.6%	1.6%
	2024-2034	0.8%	-0.3%	-8.5%	0.0%	-1.3%
15-Year	2008-2023	-1.4%	-1.8%	12.7%	-5.4%	0.7%
	2024-2039	0.9%	-0.2%	-5.7%	0.0%	-0.6%
20-Year	2003-2023	-0.5%	-0.3%	8.5%	-4.0%	1.1%
	2024-2044	1.0%	-0.1%	-4.3%	0.0%	-0.2%

Growth rates shown are Compound Annual Growth Rates.

Forecast negative growth rates for large commercial and total sales categories largely due to a large commercial consumer ceasing operations during 2024. From 2025 to 2044, annual growth rates are positive for these categories.

Narrative

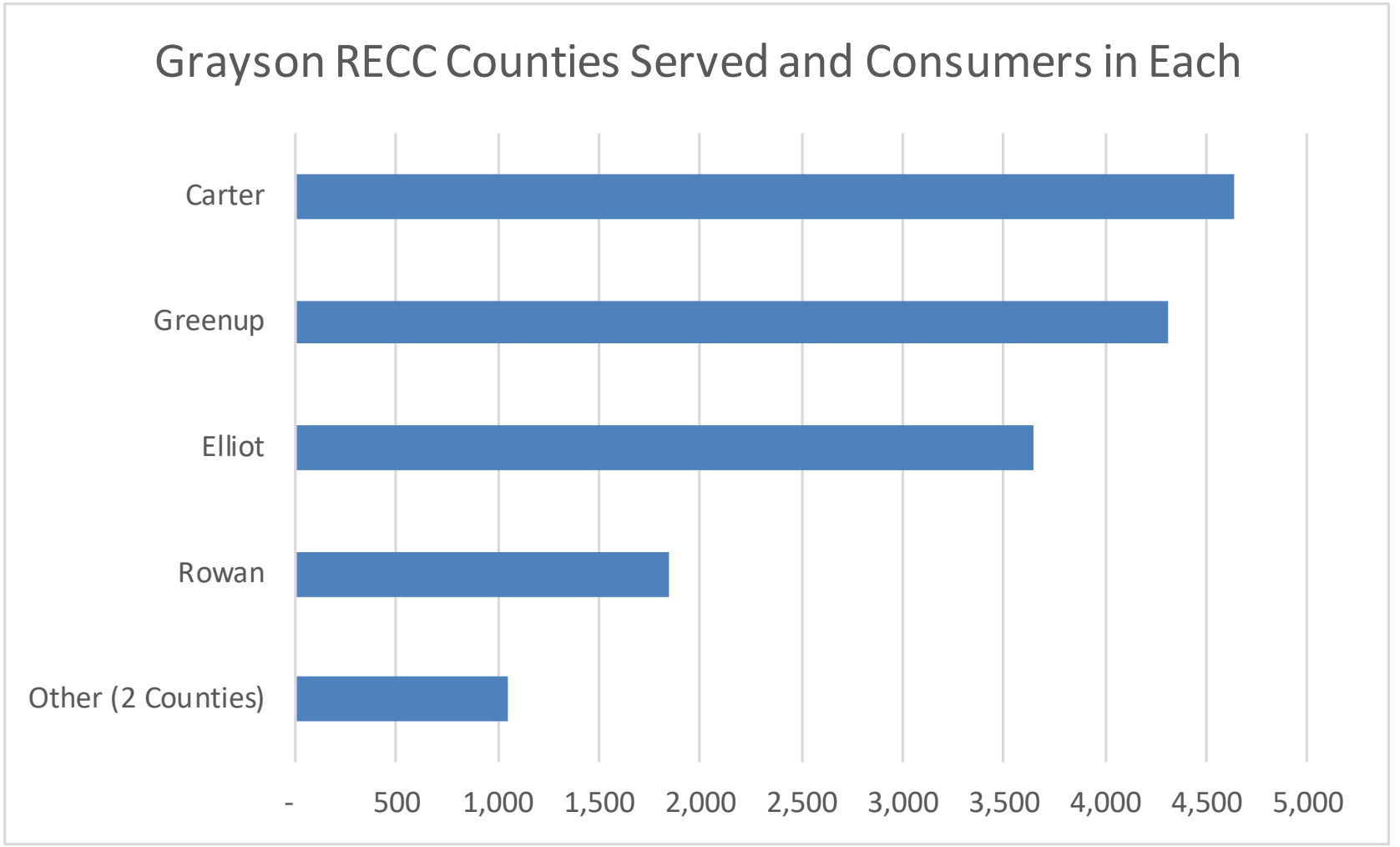
The service area of Grayson RECC is located in the eastern Kentucky Counties of Carter, Elliott, Greenup, Lawrence, Lewis and Rowan.

The average household has 2.23 people; approximately 80 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.

Narrative *(continued)*

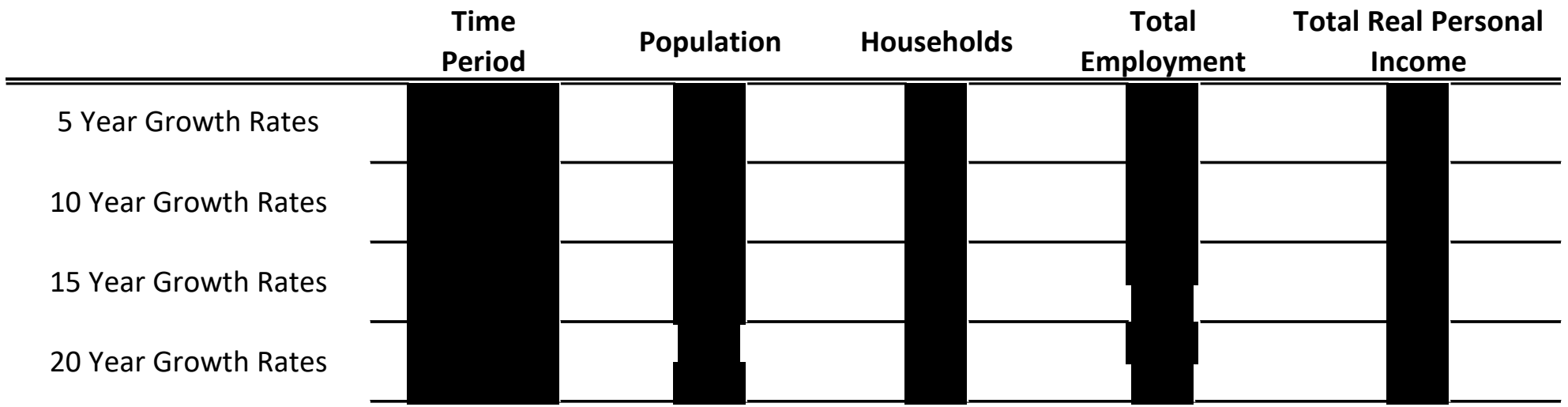
Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

Key Assumptions

Economic History and Forecast – Table 1-3



Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 50% of consumers use electricity as a primary fuel for heating, while 22% use it as a secondary fuel.
  - 17% use electric furnaces and 32% use electric heat pumps.
- 94% of consumers use electricity for cooling
  - Of those with electric cooling, 78% use central air and 22% use electric window units.
- 94% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*
Weather

- Weather data is from the Huntington weather station.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Grayson RECC as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Grayson RECC experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4

Grayson RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	270,186,693	0.2%	254,818,330	-1.1%	15,368,363	5.7%	50.9	60.6%	15,338	2,470	6.2	$19,923,071	7.4
2015	263,079,445	-2.6%	247,930,543	-2.7%	15,148,902	5.8%	46.3	64.9%	15,344	2,465	6.2	$18,455,285	7.0
2016	261,944,284	-0.4%	245,076,512	-1.2%	16,867,772	6.4%	54.9	54.5%	15,366	2,473	6.2	$17,917,378	6.8
2017	250,857,783	-4.2%	223,362,793	-8.9%	27,494,990	11.0%	59.7	47.8%	14,158	2,477	5.7	$17,151,603	6.8
2018	270,301,596	7.8%	255,884,096	14.6%	14,417,500	5.3%	55.3	55.8%	15,380	2,477	6.2	$18,299,724	6.8
2019	259,792,804	-3.9%	246,459,441	-3.7%	13,333,363	5.1%	56.1	52.9%	15,320	2,480	6.2	$17,601,579	6.8
2020	253,720,452	-2.3%	240,322,571	-2.5%	13,397,881	5.3%	54.0	53.6%	15,349	2,483	6.2	$16,248,044	6.4
2021	256,944,902	1.3%	243,604,439	1.4%	13,340,463	5.2%	50.7	57.9%	15,459	2,484	6.2	$18,378,486	7.2
2022	309,612,855	20.5%	297,984,510	22.3%	11,628,345	3.8%	83.8	42.2%	15,504	2,487	6.2	$26,278,263	8.5
2023	311,309,076	0.5%	300,985,978	1.0%	10,323,098	3.3%	52.5	67.7%	15,576	2,496	6.2	$24,900,833	8.0
5 Year Average (2019-2023)						4.5%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Grayson RECC staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Grayson RECC staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Grayson RECC's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Grayson RECC's energy forecast.

Table 1-5
Residential Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	14,113	-67	-0.5	1,067	-7	-0.7	180,714	-2,051	-1.1
2015	14,117	4	0.0	1,015	-52	-4.9	171,911	-8,803	-4.9
2016	14,166	49	0.3	999	-16	-1.6	169,779	-2,132	-1.2
2017	13,061	-1,105	-7.8	962	-36	-3.7	150,817	-18,962	-11.2
2018	14,185	1,124	8.6	1,045	83	8.6	177,905	27,088	18.0
2019	14,121	-64	-0.5	1,004	-41	-4.0	170,095	-7,811	-4.4
2020	14,149	28	0.2	986	-18	-1.8	167,386	-2,709	-1.6
2021	14,266	117	0.8	973	-13	-1.3	166,627	-758	-0.5
2022	14,329	63	0.4	1,001	28	2.9	172,197	5,570	3.3
2023	14,405	76	0.5	911	-91	-9.1	157,443	-14,755	-8.6
2024	14,465	60	0.4	969	58	6.4	168,182	10,739	6.8
2025	14,515	50	0.3	978	9	0.9	170,335	2,154	1.3
2026	14,555	40	0.3	988	10	1.1	172,632	2,296	1.3
2027	14,585	30	0.2	997	8	0.8	174,420	1,788	1.0
2028	14,605	20	0.1	1,006	9	0.9	176,291	1,871	1.1
2029	14,624	19	0.1	1,007	1	0.1	176,691	400	0.2
2030	14,646	22	0.2	1,012	5	0.5	177,801	1,110	0.6
2031	14,668	22	0.2	1,017	5	0.5	179,006	1,205	0.7
2032	14,689	21	0.1	1,026	9	0.9	180,925	1,919	1.1
2033	14,709	20	0.1	1,028	2	0.2	181,535	610	0.3
2034	14,729	20	0.1	1,035	6	0.6	182,880	1,345	0.7
2035	14,747	18	0.1	1,043	8	0.8	184,562	1,682	0.9
2036	14,764	17	0.1	1,055	12	1.2	186,927	2,364	1.3
2037	14,782	18	0.1	1,060	5	0.5	188,101	1,175	0.6
2038	14,800	18	0.1	1,069	8	0.8	189,833	1,732	0.9
2039	14,817	17	0.1	1,078	9	0.9	191,698	1,865	1.0
2040	14,834	17	0.1	1,092	13	1.2	194,305	2,608	1.4
2041	14,851	17	0.1	1,098	6	0.6	195,624	1,319	0.7
2042	14,867	16	0.1	1,109	11	1.0	197,845	2,221	1.1
2043	14,883	16	0.1	1,121	12	1.1	200,204	2,359	1.2
2044	14,899	16	0.1	1,137	16	1.4	203,324	3,120	1.6

* 2017, 2018 Adjusted for billing cycle change

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,222	14	1.2	37	-0.7	-2.0	44,930	-384	-0.8
2015	1,224	2	0.2	37	0.0	-0.1	44,957	26	0.1
2016	1,197	-27	-2.2	37	0.1	0.2	44,032	-924	-2.1
2017	*1,094*	*-103*	*-8.6*	*38*	*1.1*	*3.0*	*41,449*	*-2,584*	*-5.9*
2018	*1,192*	*98*	*9.0*	*40*	*2.0*	*5.3*	*47,566*	*6,117*	*14.8*
2019	1,196	4	0.3	39	-1.0	-2.6	46,500	-1,066	-2.2
2020	1,197	1	0.1	36	-2.5	-6.3	43,590	-2,909	-6.3
2021	1,190	-7	-0.6	39	2.5	6.9	46,306	2,715	6.2
2022	1,171	-19	-1.6	40	0.8	2.1	46,516	211	0.5
2023	1,167	-4	-0.3	39	-1.0	-2.4	45,236	-1,280	-2.8
2024	1,167	0	0.0	40	1.6	4.1	47,090	1,854	4.1
2025	1,170	3	0.3	40	-0.2	-0.4	47,007	-83	-0.2
2026	1,172	2	0.2	40	-0.2	-0.4	46,899	-108	-0.2
2027	1,174	2	0.2	40	-0.2	-0.5	46,744	-156	-0.3
2028	1,175	1	0.1	40	0.0	-0.1	46,753	9	0.0
2029	1,176	1	0.1	40	-0.3	-0.7	46,486	-267	-0.6
2030	1,177	1	0.1	39	-0.2	-0.6	46,255	-231	-0.5
2031	1,178	1	0.1	39	-0.2	-0.5	46,081	-175	-0.4
2032	1,179	1	0.1	39	0.0	0.0	46,112	31	0.1
2033	1,179	0	0.0	39	-0.2	-0.4	45,912	-200	-0.4
2034	1,180	1	0.1	39	-0.1	-0.2	45,853	-59	-0.1
2035	1,180	0	0.0	39	0.0	-0.1	45,823	-30	-0.1
2036	1,180	0	0.0	39	0.1	0.3	45,955	132	0.3
2037	1,181	1	0.1	39	-0.1	-0.2	45,879	-75	-0.2
2038	1,181	0	0.0	39	0.1	0.2	45,950	71	0.2
2039	1,181	0	0.0	39	0.1	0.2	46,024	74	0.2
2040	1,181	0	0.0	39	0.1	0.3	46,149	125	0.3
2041	1,181	0	0.0	39	-0.1	-0.2	46,039	-110	-0.2
2042	1,181	0	0.0	39	0.0	0.1	46,069	30	0.1
2043	1,181	0	0.0	39	0.1	0.1	46,137	68	0.1
2044	1,182	1	0.1	39	0.1	0.4	46,350	213	0.5

* 2017, 2018 billing cycle change

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Grayson RECC had 3 consumers in this class and consumers are projected to remain at 3 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7

Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	2	0	0.0	14,562	-173	-1.2	29,123	-346	-1.2
2015	2	0	0.0	15,506	944	6.5	31,012	1,889	6.5
2016	2	0	0.0	15,607	101	0.7	31,215	203	0.7
2017	2	0	0.0	15,526	-81	-0.5	31,053	-162	-0.5
2018	2	0	0.0	15,183	-343	-2.2	30,367	-686	-2.2
2019	2	0	0.0	14,910	-273	-1.8	29,821	-546	-1.8
2020	2	0	0.0	14,652	-259	-1.7	29,303	-517	-1.7
2021	2	0	0.0	15,316	664	4.5	30,632	1,329	4.5
2022	3	1	50.0	26,412	11,096	72.4	79,235	48,603	158.7
2023	3	0	0.0	32,757	6,346	24.0	98,272	19,037	24.0
2024	3	0	0.0	27,753	-5,004	-15.3	83,259	-15,013	-15.3
2025	2	-1	-33.3	15,317	-12,436	-44.8	30,634	-52,626	-63.2
2026	2	0	0.0	15,317	0	0.0	30,634	0	0.0
2027	2	0	0.0	15,317	0	0.0	30,634	0	0.0
2028	2	0	0.0	15,317	0	0.0	30,634	0	0.0
2029	3	1	50.0	11,467	-3,850	-25.1	34,400	3,767	12.3
2030	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2031	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2032	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2033	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2034	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2035	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2036	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2037	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2038	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2039	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2040	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2041	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2042	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2043	3	0	0.0	11,467	0	0.0	34,400	0	0.0
2044	3	0	0.0	11,467	0	0.0	34,400	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Grayson RECC serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1	0	0.0	4,246	2	0.0	51	0	0.0
2015	1	0	0.0	4,252	6	0.1	51	0	0.1
2016	1	0	0.0	4,180	-72	-1.7	50	-1	-1.7
2017	1	0	0.0	3,682	-497	-11.9	44	-6	-11.9
2018	1	0	0.0	3,879	197	5.3	47	2	5.3
2019	1	0	0.0	3,697	-182	-4.7	44	-2	-4.7
2020	1	0	0.0	3,604	-93	-2.5	43	-1	-2.5
2021	1	0	0.0	3,267	-337	-9.4	39	-4	-9.4
2022	1	0	0.0	2,986	-280	-8.6	36	-3	-8.6
2023	1	0	0.0	2,933	-53	-1.8	35	-1	-1.8
2024	1	0	0.0	2,890	-43	-1.5	35	-1	-1.5
2025	1	0	0.0	2,890	0	0.0	35	0	0.0
2026	1	0	0.0	2,890	0	0.0	35	0	0.0
2027	1	0	0.0	2,890	0	0.0	35	0	0.0
2028	1	0	0.0	2,890	0	0.0	35	0	0.0
2029	1	0	0.0	2,890	0	0.0	35	0	0.0
2030	1	0	0.0	2,890	0	0.0	35	0	0.0
2031	1	0	0.0	2,890	0	0.0	35	0	0.0
2032	1	0	0.0	2,890	0	0.0	35	0	0.0
2033	1	0	0.0	2,890	0	0.0	35	0	0.0
2034	1	0	0.0	2,890	0	0.0	35	0	0.0
2035	1	0	0.0	2,890	0	0.0	35	0	0.0
2036	1	0	0.0	2,890	0	0.0	35	0	0.0
2037	1	0	0.0	2,890	0	0.0	35	0	0.0
2038	1	0	0.0	2,890	0	0.0	35	0	0.0
2039	1	0	0.0	2,890	0	0.0	35	0	0.0
2040	1	0	0.0	2,890	0	0.0	35	0	0.0
2041	1	0	0.0	2,890	0	0.0	35	0	0.0
2042	1	0	0.0	2,890	0	0.0	35	0	0.0
2043	1	0	0.0	2,890	0	0.0	35	0	0.0
2044	1	0	0.0	2,890	0	0.0	35	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Grayson RECC's peak demands.

Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

	Normal		**Extreme**	
Degrees	0	-8	-11	-16
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**
Non-Coincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	73	79	81	84
2025 - 26	73	79	81	85
2026 - 27	74	79	82	85
2027 - 28	74	80	82	86
2028 - 29	75	81	83	86
2029 - 30	75	81	83	87
2030 - 31	75	81	83	87
2031 - 32	76	82	84	87
2032 - 33	76	82	84	87
2033 - 34	76	82	84	88
2034 - 35	76	82	84	88
2035 - 36	77	83	85	89
2036 - 37	77	83	85	89
2037 - 38	78	83	85	89
2038 - 39	78	84	86	90
2039 - 40	79	84	87	90
2040 - 41	79	85	87	90
2041 - 42	79	85	87	91
2042 - 43	80	86	88	91
2043 - 44	81	86	88	92

	Normal		**Extreme**	
Degrees	95	98	100	102
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**
Non-Coincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	63	66	68	71
2025	55	58	60	62
2026	55	58	60	62
2027	55	58	61	63
2028	56	59	61	63
2029	57	60	62	64
2030	57	60	62	64
2031	57	60	62	64
2032	57	60	63	65
2033	58	61	63	65
2034	58	61	63	65
2035	58	61	63	65
2036	59	62	64	66
2037	59	62	64	66
2038	59	62	65	67
2039	60	63	65	67
2040	60	63	65	68
2041	61	64	66	68
2042	61	64	66	68
2043	62	65	67	69
2044	62	65	67	70

Blue Grass Energy Cooperative Corporation

2024 Load Forecast

August 2024

Prepared by: EKPC's Power Supply Analytics Department

Blue Grass Energy
A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

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Introduction

Executive Summary

Blue Grass Energy Cooperative Corporation (Blue Grass Energy), located in Nicholasville, Kentucky, is an electric distribution cooperative that serves members in 23 counties. This load forecast report contains Blue Grass Energy's long-range forecast of energy and seasonal peak demand.

Blue Grass Energy and its power supplier, East Kentucky Power Cooperative (EKPC), worked jointly to prepare the load forecast. Factors considered in preparing the forecast include the local economy, population and housing trends, service area industrial development, household income, weather, and appliance efficiency changes.

EKPC prepared a preliminary load forecast, which was reviewed by Blue Grass Energy for reasonability. Final projections reflect a rigorous analysis of historical data combined with the experience and judgment of the President/CEO and staff of Blue Grass Energy. Key assumptions are presented below.

Executive Summary *(continued)*

The load forecast is prepared every two years as part of the overall planning cycle at EKPC and Blue Grass Energy. Cooperation helps to ensure that the forecast meets both parties' needs. Blue Grass Energy uses the forecast in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of resource planning, transmission planning, demand-side planning, marketing analysis, and financial forecasting.

The complete load forecast for Blue Grass Energy is reported in Table 1-1. Sales by class, total purchases, winter and summer peak demands, and load factor are presented for the years 2014 through 2044.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Small Comm. Sales (MWh)	Large Comm. Sales (MWh)	Public Street & Hwy. Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2014	834,060	164,359	337,889	1,182	1,337,490	1,457	4.3	1,398,378
2015	790,929	166,787	341,839	1,182	1,300,737	1,449	4.2	1,359,813
2016	804,233	172,856	345,184	1,200	1,323,473	1,341	4.3	1,383,686
2017	769,128	165,630	343,883	1,121	1,279,762	1,253	4.2	1,337,803
2018	894,229	169,509	352,797	838	1,417,373	1,383	1.8	1,444,803
2019	839,928	164,731	340,136	887	1,345,683	1,293	3.7	1,398,957
2020	831,706	151,143	289,605	901	1,273,355	1,154	4.0	1,328,143
2021	847,114	159,908	278,950	911	1,286,883	1,162	3.9	1,340,872
2022	875,129	170,992	306,876	898	1,353,895	1,162	3.8	1,408,329
2023	789,068	174,947	329,178	895	1,294,088	1,059	3.7	1,345,017
2024	890,815	175,839	347,165	898	1,414,718	1,166	3.8	1,472,376
2025	909,066	177,661	353,476	898	1,441,101	1,166	3.8	1,499,812
2026	926,835	179,120	354,091	898	1,460,945	1,166	3.8	1,520,448
2027	940,404	179,441	354,104	898	1,474,847	1,166	3.8	1,534,905
2028	955,199	180,359	363,302	898	1,499,758	1,166	3.8	1,560,810
2029	962,487	180,486	363,302	898	1,507,173	1,166	3.8	1,568,520
2030	973,014	180,842	363,302	898	1,518,056	1,166	3.8	1,579,837
2031	983,811	181,355	363,302	898	1,529,366	1,166	3.8	1,591,598
2032	997,198	182,434	372,500	898	1,553,031	1,166	3.8	1,616,208
2033	1,003,972	182,454	372,500	898	1,559,824	1,166	3.8	1,623,272
2034	1,014,129	183,031	372,500	898	1,570,558	1,166	3.8	1,634,434
2035	1,025,790	183,770	381,698	898	1,592,157	1,166	3.8	1,656,895
2036	1,041,343	185,144	381,698	898	1,609,083	1,166	3.8	1,674,496
2037	1,050,638	185,658	381,698	898	1,618,892	1,166	3.8	1,684,696
2038	1,063,422	186,785	390,896	898	1,642,001	1,166	3.8	1,708,728
2039	1,076,748	187,907	390,896	898	1,656,449	1,166	3.8	1,723,753
2040	1,093,868	189,177	390,896	898	1,674,839	1,166	3.8	1,742,876
2041	1,104,226	189,509	400,094	898	1,694,727	1,166	3.8	1,763,558
2042	1,119,007	190,473	400,094	898	1,710,472	1,166	3.8	1,779,931
2043	1,134,277	191,623	400,094	898	1,726,892	1,166	3.8	1,797,006
2044	1,153,455	193,375	400,094	898	1,747,822	1,166	3.8	1,818,771

Table 1-1 *(continued)*

Peaks Summary

Winter		*Summer*				*Temperature*	
Season	Non-Coincident Peak Demand	Year	Non-Coincident Peak Demand	Year	Purchased Power (MWh)	Load Factor (%)	Minimum Temperature	Maximum Temperature
2013 - 14	418.3	2014	259.6	2014	1,398,378	38.2%	0° F	91° F
2014 - 15	427.7	2015	257.5	2015	1,359,813	36.3%	-18° F	91° F
2015- 16	341.2	2016	269.7	2016	1,383,686	46.3%	4° F	95° F
2016 - 17	338.3	2017	266.3	2017	1,337,803	45.1%	4° F	94° F
2017 - 18	405.0	2018	275.6	2018	1,444,803	40.7%	-3° F	97° F
2018 - 19	371.0	2019	276.3	2019	1,398,957	43.0%	2° F	97° F
2019 - 20	315.4	2020	265.9	2020	1,328,143	48.1%	12° F	93° F
2020 - 21	350.8	2021	282.2	2021	1,340,872	43.6%	2° F	91° F
2021 - 22	359.8	2022	287.9	2022	1,408,329	44.7%	3° F	98° F
2022 - 23	484.8	2023	283.0	2023	1,345,017	31.7%	-5° F	94° F
2023 - 24	461.0	2024	295.5	2024	1,472,376	36.5%	-7° F	
2024 - 25	454.0	2025	303.3	2025	1,499,812	37.7%		
2025 - 26	459.7	2026	306.8	2026	1,520,448	37.8%		
2026 - 27	463.1	2027	308.9	2027	1,534,905	37.8%		
2027 - 28	468.8	2028	312.8	2028	1,560,810	38.0%		
2028 - 29	470.1	2029	314.4	2029	1,568,520	38.1%		
2029 - 30	472.5	2030	316.3	2030	1,579,837	38.2%		
2030 - 31	475.1	2031	318.3	2031	1,591,598	38.2%		
2031 - 32	480.4	2032	322.2	2032	1,616,208	38.4%		
2032 - 33	481.4	2033	323.8	2033	1,623,272	38.5%		
2033 - 34	483.9	2034	325.8	2034	1,634,434	38.6%		
2034 - 35	488.3	2035	329.7	2035	1,656,895	38.7%		
2035 - 36	492.8	2036	332.6	2036	1,674,496	38.8%		
2036 - 37	494.6	2037	334.9	2037	1,684,696	38.9%		
2037 - 38	499.4	2038	339.2	2038	1,708,728	39.1%		
2038 - 39	502.8	2039	342.0	2039	1,723,753	39.1%		
2039 - 40	507.5	2040	345.2	2040	1,742,876	39.2%		
2040 - 41	511.0	2041	349.2	2041	1,763,558	39.4%		
2041 - 42	514.6	2042	352.2	2042	1,779,931	39.5%		
2042 - 43	518.4	2043	355.5	2043	1,797,006	39.6%		
2043 - 44	523.8	2044	359.1	2044	1,818,771	39.6%		

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.1 percent a year for the period 2024-2044, compared to a 1.4 percent growth rate projected in the 2022 load forecast for the period 2022-2042. Results shown in Table 1-2.

- Winter peak demands are projected to increase 0.8 percent a year over the forecast period. Summer peak demands for the forecast period indicate a growth rate of 1.0 percent.

- Load factor increases from 37.7% to 39.6% (2025 to 2044).

Load factor presented for 2025 and 2044 because both years assume normal weather.

Executive Summary *(continued)*

Overall Results – Table 1-2

	Time Period	Residential	Small Commercial	Large Commercial	Public Street & Hwy. Lighting	Total Sales
5-Year	2018-2023	-2.5%	0.6%	-1.4%	1.3%	-1.8%
	2024-2029	1.6%	0.5%	0.9%	0.0%	1.3%
10-Year	2013-2023	-0.2%	0.9%	0.1%	-2.6%	0.0%
	2024-2034	1.3%	0.4%	0.7%	0.0%	1.1%
15-Year	2008-2023	-0.3%	2.1%	0.8%	-1.3%	0.2%
	2024-2039	1.3%	0.4%	0.8%	0.0%	1.1%
20-Year	2003-2023	0.6%	2.3%	1.1%	0.4%	0.9%
	2024-2044	1.3%	0.5%	0.7%	0.0%	1.1%

Growth rates shown are Compound Annual Growth Rates.

Narrative

Blue Grass Energy's service area is located in central Kentucky serving 23 counties, reaching from Berea to the Ohio river. The counties served by Blue Grass Energy include; Anderson, Bourbon, Bracken, Fayette, Franklin, Harrison, Jessamine, Madison, Mercer, Nicholas, Pendleton, and Scott, with members in eleven other counties.

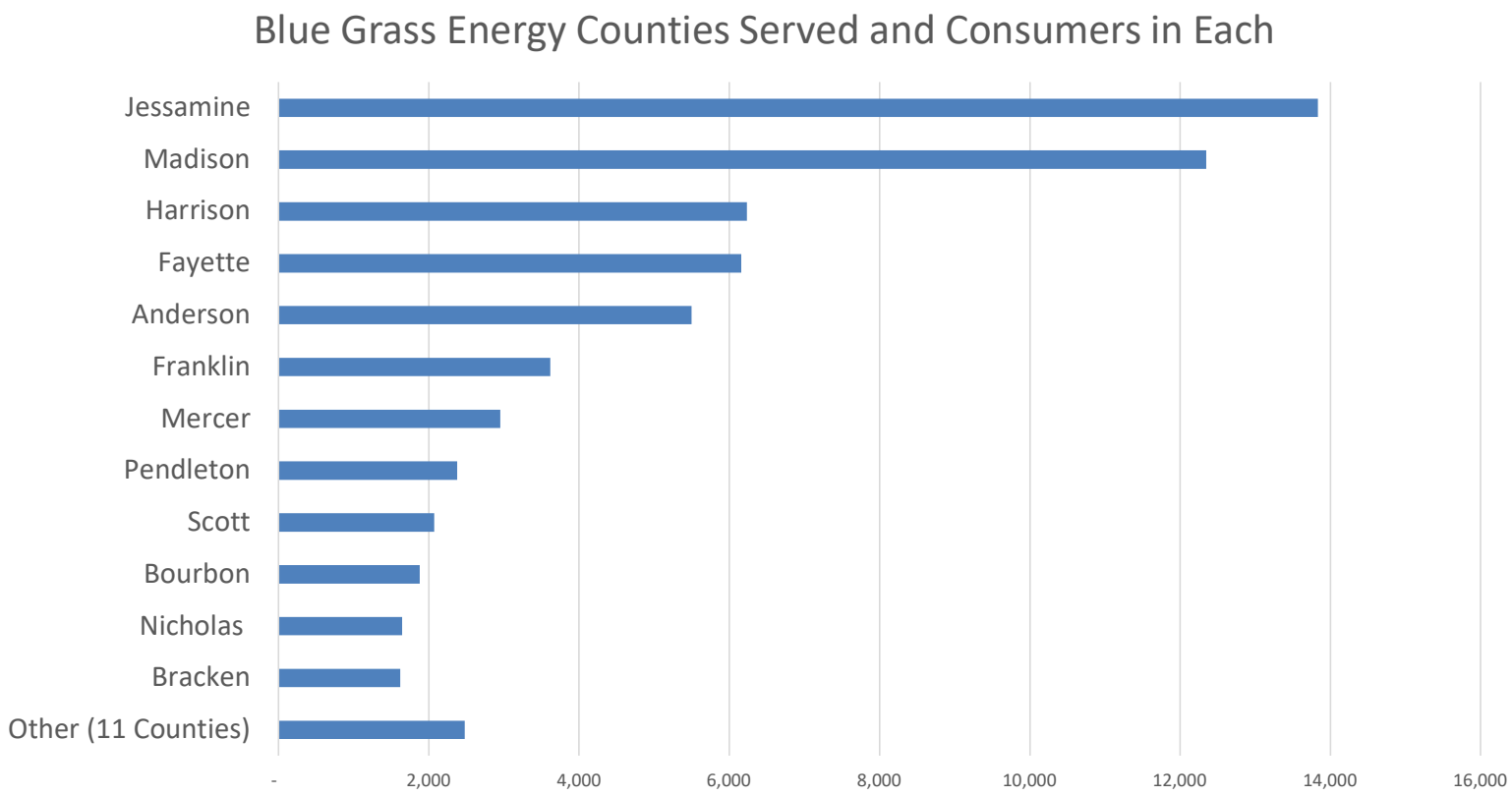
Blue Grass Energy maintains approximately 4,900 miles of line serving more than 62,000 members. The average residential member uses approximately 1,200 kWh monthly.

The average household has 2.31 people; approximately 79 percent of all homes are headed by someone age 55 or greater.

Household composition information is based on results from EKPC 2022 Residential Appliance Saturation Survey.
Line milage, number of members, and average residential usage is from 2024 Kentucky Electric Cooperatives Directory.

Narrative *(continued)*

Counties Served – Figure 1-1



Figures from 2024 Kentucky Electric Cooperatives Directory.

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

Key Assumptions

Economic History and Forecast – Table 1-3

	Time Period	Population	Households	Total Employment	Total Real Personal Income
5 Year Growth Rates	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10 Year Growth Rates	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
15 Year Growth Rates	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
20 Year Growth Rates	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Figures calculated by EKPC using data provided by S&P Global Market Intelligence (connect.ihsmarkit.com). Total Real Personal Income is reported in millions of 2017 dollars. Growth rates shown are Compound Annual Growth Rates.

Key Assumptions *(continued)*

Appliance Saturations

- 66% of consumers use electricity as a primary fuel for heating, while 19% use it as a secondary fuel.
  - 18% use electric furnaces and 45% use electric heat pumps.
- 96% of consumers use electricity for cooling
  - Of those with electric cooling, 93% use central air and 7% use electric window units.
- 85% of consumers use electric water heaters.
- These saturations are not expected to change meaningfully by 2044.

Appliance Efficiencies

- Energy Information Administration (EIA) projects appliance efficiencies each year.
- Similar to 2022 projections, heating and cooling equipment show slow but steady increase.

Appliance saturation assumptions based on results from EKPC 2022 Residential Appliance Saturation Survey. Appliance efficiencies are from EIA 2023 Energy Outlook (eia.gov/outlooks/aeo).

Key Assumptions *(continued)*

Weather

- Weather data is from the LEX weather station at Blue Grass Airport.

- Normal weather, a 20-year average of historical temperatures, is assumed for the forecast years.

National Weather Service Data compiled by DTN

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for Rural Utilities Services (RUS) classifications. Table 1-4 reports historical data for Blue Grass Energy as reported on RUS Form 7.

A preliminary forecast was prepared during the second quarter of 2024, after Blue Grass Energy experienced its winter peak. Regional economic factors including household and employment growth in combination with historical billing information, appliance saturations, appliance efficiencies, and weather data are used to develop the long range forecast. Expected new load and changes to existing load are also incorporated.

Table 1-4 Blue Grass Energy Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand	Annual Load Factor	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
2014	1,398,378,224	3.9%	1,337,490,207	3.8%	59,431,197	4.3%	381.2	41.9%	56,075	4,710	11.9	$100,047,737	7.2
2015	1,359,812,906	-2.8%	1,300,737,458	-2.7%	57,626,774	4.2%	416.4	37.3%	56,584	4,731	12.0	$92,479,477	6.8
2016	1,383,686,451	1.8%	1,323,472,948	1.7%	58,873,003	4.3%	381.2	41.4%	57,319	4,742	12.1	$92,099,188	6.7
2017	1,337,802,640	-3.3%	1,279,761,676	-3.3%	56,787,549	4.2%	381.2	39.9%	57,913	4,762	12.2	$88,796,456	6.6
2018	1,444,803,232	8.0%	1,417,373,431	10.8%	26,046,678	1.8%	387.7	42.5%	58,443	4,788	12.2	$94,998,004	6.6
2019	1,398,957,054	-3.2%	1,345,682,744	-5.1%	51,980,860	3.7%	357.7	44.6%	58,968	4,810	12.3	$91,669,653	6.6
2020	1,328,142,652	-5.1%	1,273,354,643	-5.4%	53,634,303	4.0%	312.1	48.6%	59,889	4,842	12.4	$82,544,809	6.2
2021	1,340,871,657	1.0%	1,286,882,929	1.1%	52,826,431	3.9%	339.9	44.9%	60,961	4,882	12.5	$94,478,456	7.0
2022	1,408,328,547	5.0%	1,353,895,457	5.2%	53,271,270	3.8%	464.9	34.6%	61,945	4,914	12.6	$121,345,153	8.6
2023	1,345,017,187	-4.5%	1,294,087,950	-4.4%	49,870,737	3.7%	302.5	50.8%	62,768	4,949	12.7	$112,244,948	8.3
5 Year Average (2019-2023)						3.8%							

Methodology and Results *(continued)*

The preliminary forecast was presented to Blue Grass Energy staff. Changes were made to the forecast as needed based on new information, such as new large loads or subdivisions. In some cases, other assumptions were based on input from Blue Grass Energy staff.

Methodology and Results *(continued)*

Residential Forecast

Residential consumers are forecast by means of regression analysis incorporating expert judgement where appropriate. Regression equations for residential consumers are a function of regional economic and demographic variables. Household growth and use per consumer are primary drivers for residential forecasts. Table 1-5 reports Blue Grass Energy's consumer forecast.

Residential energy sales were analyzed by means of regression analysis as a function of residential consumers, base 60 heating degree days (HDD), base 65 cooling degree days (CDD), and appliance saturations and efficiencies. Table 1-5 reports Blue Grass Energy's energy forecast.

Table 1-5
Residential Summary

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	53,336	330	0.6	1,303	43	3.4	834,060	32,430	4.0
2015	53,808	472	0.9	1,225	-78	-6.0	790,929	-43,131	-5.2
2016	54,534	726	1.3	1,229	4	0.3	804,233	13,304	1.7
2017	55,101	567	1.0	1,163	-66	-5.3	769,128	-35,106	-4.4
2018	55,571	470	0.9	1,341	178	15.3	894,229	125,102	16.3
2019	56,024	453	0.8	1,249	-92	-6.8	839,928	-54,301	-6.1
2020	56,881	857	1.5	1,218	-31	-2.5	831,706	-8,223	-1.0
2021	57,902	1,021	1.8	1,219	1	0.1	847,114	15,409	1.9
2022	58,839	937	1.6	1,239	20	1.7	875,129	28,015	3.3
2023	59,622	783	1.3	1,103	-137	-11.0	789,068	-86,061	-9.8
2024	60,423	801	1.3	1,229	126	11.4	890,815	101,747	12.9
2025	61,203	780	1.3	1,238	9	0.7	909,066	18,251	2.0
2026	61,946	743	1.2	1,247	9	0.7	926,835	17,769	2.0
2027	62,632	686	1.1	1,251	4	0.4	940,404	13,569	1.5
2028	63,252	620	1.0	1,258	7	0.6	955,199	14,795	1.6
2029	63,817	565	0.9	1,257	-2	-0.1	962,487	7,288	0.8
2030	64,366	549	0.9	1,260	3	0.2	973,014	10,527	1.1
2031	64,905	539	0.8	1,263	3	0.3	983,811	10,797	1.1
2032	65,408	503	0.8	1,270	7	0.6	997,198	13,387	1.4
2033	65,896	488	0.7	1,270	-1	-0.1	1,003,972	6,773	0.7
2034	66,373	477	0.7	1,273	4	0.3	1,014,129	10,157	1.0
2035	66,825	452	0.7	1,279	6	0.5	1,025,790	11,661	1.1
2036	67,274	449	0.7	1,290	11	0.8	1,041,343	15,552	1.5
2037	67,728	454	0.7	1,293	3	0.2	1,050,638	9,295	0.9
2038	68,186	458	0.7	1,300	7	0.5	1,063,422	12,784	1.2
2039	68,626	440	0.6	1,308	8	0.6	1,076,748	13,326	1.3
2040	69,062	436	0.6	1,320	12	0.9	1,093,868	17,120	1.6
2041	69,483	421	0.6	1,324	4	0.3	1,104,226	10,358	0.9
2042	69,887	404	0.6	1,334	10	0.8	1,119,007	14,781	1.3
2043	70,267	380	0.5	1,345	11	0.8	1,134,277	15,270	1.4
2044	70,634	367	0.5	1,361	16	1.2	1,153,455	19,178	1.7

Methodology and Results *(continued)*

Small Commercial Forecast

The Small Commercial class is projected using two equations, a consumer equation and an energy equation. Both are determined through regression analysis and include inputs related to the economy and the residential consumer forecast. Projections are reported in Table 1-6.

Table 1-6

Small Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	2,686	23	0.9	61	1	1.6	164,359	3,932	2.5
2015	2,724	38	1.4	61	0	0.1	166,787	2,427	1.5
2016	2,739	15	0.6	63	2	3.1	172,856	6,069	3.6
2017	2,784	45	1.6	59	-4	-5.7	165,630	-7,225	-4.2
2018	2,842	58	2.1	60	0	0.3	169,509	3,879	2.3
2019	2,905	63	2.2	57	-3	-4.9	164,731	-4,778	-2.8
2020	2,968	63	2.2	51	-6	-10.2	151,143	-13,588	-8.2
2021	3,017	49	1.7	53	2	4.1	159,908	8,765	5.8
2022	3,067	50	1.7	56	3	5.2	170,992	11,084	6.9
2023	3,105	38	1.2	56	1	1.1	174,947	3,955	2.3
2024	3,153	48	1.5	56	-1	-1.0	175,839	892	0.5
2025	3,203	50	1.6	55	0	-0.5	177,661	1,822	1.0
2026	3,254	51	1.6	55	0	-0.8	179,120	1,460	0.8
2027	3,301	47	1.4	54	-1	-1.2	179,441	321	0.2
2028	3,343	42	1.3	54	0	-0.8	180,359	918	0.5
2029	3,382	39	1.2	53	-1	-1.1	180,486	127	0.1
2030	3,419	37	1.1	53	0	-0.9	180,842	356	0.2
2031	3,456	37	1.1	52	0	-0.8	181,355	513	0.3
2032	3,490	34	1.0	52	0	-0.4	182,434	1,080	0.6
2033	3,524	34	1.0	52	0	-1.0	182,454	19	0.0
2034	3,556	32	0.9	51	0	-0.6	183,031	577	0.3
2035	3,587	31	0.9	51	0	-0.5	183,770	740	0.4
2036	3,618	31	0.9	51	0	-0.1	185,144	1,374	0.7
2037	3,649	31	0.9	51	0	-0.6	185,658	514	0.3
2038	3,680	31	0.8	51	0	-0.2	186,785	1,127	0.6
2039	3,711	31	0.8	51	0	-0.2	187,907	1,122	0.6
2040	3,740	29	0.8	51	0	-0.1	189,177	1,270	0.7
2041	3,769	29	0.8	50	0	-0.6	189,509	332	0.2
2042	3,797	28	0.7	50	0	-0.2	190,473	964	0.5
2043	3,823	26	0.7	50	0	-0.1	191,623	1,150	0.6
2044	3,848	25	0.7	50	0	0.3	193,375	1,752	0.9

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial consumers are those with loads 1 MW or greater. In 2023 Blue Grass Energy had 14 consumers in this class and consumers are projected to increase to 20 by 2044. Large commercial results are reported in Table 1-7.

Table 1-7
Large Commercial Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	10	-1	-9.1	33,789	4,268	14.5	337,889	13,156	4.1
2015	10	0	0.0	34,184	395	1.2	341,839	3,950	1.2
2016	10	0	0.0	34,518	334	1.0	345,184	3,345	1.0
2017	11	1	10.0	31,262	-3,256	-9.4	343,883	-1,301	-0.4
2018	11	0	0.0	32,072	810	2.6	352,797	8,914	2.6
2019	10	-1	-9.1	34,014	1,941	6.1	340,136	-12,661	-3.6
2020	10	0	0.0	28,961	-5,053	-14.9	289,605	-50,530	-14.9
2021	11	1	10.0	25,359	-3,601	-12.4	278,950	-10,656	-3.7
2022	12	1	9.1	25,573	214	0.8	306,876	27,927	10.0
2023	14	2	16.7	23,513	-2,060	-8.1	329,178	22,302	7.3
2024	15	1	7.1	23,144	-368	-1.6	347,165	17,987	5.5
2025	15	0	0.0	23,565	421	1.8	353,476	6,311	1.8
2026	15	0	0.0	23,606	41	0.2	354,091	615	0.2
2027	15	0	0.0	23,607	1	0.0	354,104	12	0.0
2028	16	1	6.7	22,706	-901	-3.8	363,302	9,198	2.6
2029	16	0	0.0	22,706	0	0.0	363,302	0	0.0
2030	16	0	0.0	22,706	0	0.0	363,302	0	0.0
2031	16	0	0.0	22,706	0	0.0	363,302	0	0.0
2032	17	1	6.3	21,912	-795	-3.5	372,500	9,198	2.5
2033	17	0	0.0	21,912	0	0.0	372,500	0	0.0
2034	17	0	0.0	21,912	0	0.0	372,500	0	0.0
2035	18	1	5.9	21,205	-706	-3.2	381,698	9,198	2.5
2036	18	0	0.0	21,205	0	0.0	381,698	0	0.0
2037	18	0	0.0	21,205	0	0.0	381,698	0	0.0
2038	19	1	5.6	20,573	-632	-3.0	390,896	9,198	2.4
2039	19	0	0.0	20,573	0	0.0	390,896	0	0.0
2040	19	0	0.0	20,573	0	0.0	390,896	0	0.0
2041	20	1	5.3	20,005	-569	-2.8	400,094	9,198	2.4
2042	20	0	0.0	20,005	0	0.0	400,094	0	0.0
2043	20	0	0.0	20,005	0	0.0	400,094	0	0.0
2044	20	0	0.0	20,005	0	0.0	400,094	0	0.0

Methodology and Results *(continued)*

Public Street & Highway Lighting Forecast

Blue Grass Energy serves street light accounts which are classified in the 'Public Street & Highway Lighting' category. This class is modeled separately. Results are reported in Table 1-8.

Table 1-8

Public Street & Highway Lighting Summary

	Consumers			Use Per Consumer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	43	-2	-4.4	2,290	134	6.2	1,182	18	1.5
2015	42	-1	-2.3	2,346	55	2.4	1,182	0	0.0
2016	36	-6	-14.3	2,778	433	18.4	1,200	18	1.5
2017	17	-19	-52.8	5,495	2,717	97.8	1,121	-79	-6.6
2018	19	2	11.8	3,676	-1,820	-33.1	838	-283	-25.2
2019	29	10	52.6	2,550	-1,126	-30.6	887	49	5.9
2020	30	1	3.4	2,502	-48	-1.9	901	13	1.5
2021	31	1	3.3	2,450	-52	-2.1	911	11	1.2
2022	27	-4	-12.9	2,773	323	13.2	898	-13	-1.4
2023	27	0	0.0	2,762	-11	-0.4	895	-4	-0.4
2024	27	0	0.0	2,773	11	0.4	898	4	0.4
2025	27	0	0.0	2,773	0	0.0	898	0	0.0
2026	27	0	0.0	2,773	0	0.0	898	0	0.0
2027	27	0	0.0	2,773	0	0.0	898	0	0.0
2028	27	0	0.0	2,773	0	0.0	898	0	0.0
2029	27	0	0.0	2,773	0	0.0	898	0	0.0
2030	27	0	0.0	2,773	0	0.0	898	0	0.0
2031	27	0	0.0	2,773	0	0.0	898	0	0.0
2032	27	0	0.0	2,773	0	0.0	898	0	0.0
2033	27	0	0.0	2,773	0	0.0	898	0	0.0
2034	27	0	0.0	2,773	0	0.0	898	0	0.0
2035	27	0	0.0	2,773	0	0.0	898	0	0.0
2036	27	0	0.0	2,773	0	0.0	898	0	0.0
2037	27	0	0.0	2,773	0	0.0	898	0	0.0
2038	27	0	0.0	2,773	0	0.0	898	0	0.0
2039	27	0	0.0	2,773	0	0.0	898	0	0.0
2040	27	0	0.0	2,773	0	0.0	898	0	0.0
2041	27	0	0.0	2,773	0	0.0	898	0	0.0
2042	27	0	0.0	2,773	0	0.0	898	0	0.0
2043	27	0	0.0	2,773	0	0.0	898	0	0.0
2044	27	0	0.0	2,773	0	0.0	898	0	0.0

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme weather events can dramatically influence Blue Grass Energy's peak demands. Table 1-9 reports the impact of extreme temperature on system demands.

Table 1-9: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Normal		**Extreme**	
Degrees	-3	-12	-17	-25
Probability	*50%*	*20%*	*10%*	*3%*
Occurs Once Every	**2 Years**	**5 Years**	**10 Years**	**30 Years**

Noncoincident Winter Peak Demand - MW				
Season	Normal		Extreme	
2024 - 25	454	474	485	502
2025 - 26	460	480	491	508
2026 - 27	463	483	494	512
2027 - 28	469	489	500	518
2028 - 29	470	491	502	520
2029 - 30	473	493	505	523
2030 - 31	475	496	508	526
2031 - 32	480	501	513	532
2032 - 33	481	503	514	533
2033 - 34	484	505	517	536
2034 - 35	488	510	522	541
2035 - 36	493	514	526	546
2036 - 37	495	516	528	548
2037 - 38	499	521	533	553
2038 - 39	503	525	537	557
2039 - 40	508	530	542	562
2040 - 41	511	533	546	566
2041 - 42	515	537	550	569
2042 - 43	518	541	554	574
2043 - 44	524	547	559	579

Summer Peak Day Maximum Temperatures				
	Normal		**Extreme**	
Degrees	96	99	101	103
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Noncoincident Summer Peak Demand - MW				
Year	Normal		Extreme	
2024	296	310	319	329
2025	303	318	327	337
2026	307	321	331	341
2027	309	323	333	343
2028	313	327	337	347
2029	314	329	339	349
2030	316	331	341	351
2031	318	333	344	354
2032	322	337	348	358
2033	324	339	350	360
2034	326	341	352	362
2035	330	345	356	366
2036	333	348	359	369
2037	335	351	361	372
2038	339	355	366	376
2039	342	358	369	380
2040	345	361	372	383
2041	349	365	376	387
2042	352	368	380	390
2043	355	372	383	394
2044	359	375	387	398