EAST KENTUCKY POWER COOPERATIVE

A Touchstone Energy® Cooperative

2025 - 2039 Load Forecast

Prepared by:
Power Supply Analytics Department

December 2024

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Section 1.0
Executive Summary and Key Results

East Kentucky Power Cooperative Inc. (EKPC) is a generation and transmission electric cooperative located in Winchester, Kentucky and is a member of the PJM Interconnection LLC (PJM). EKPC is owned by 16 owner-member distribution cooperatives (owner-members) serving a population of approximately 1,100,000.

EKPC's load forecast is prepared every two years in accordance with EKPC's Load Forecast Work Plan (Work Plan) which was prepared in December 2023. The Work Plan details the methodology used to develop the forecast.

The EKPC Power Supply Analytics Department works with the staff of each owner-member to prepare 16 owner-member forecasts. Once finalized, EKPC aggregates the owner-member forecasts, adds projections of EKPC facilities and transmission losses, and incorporates energy efficiency impacts, demand side management impacts, and electric vehicle (EV) assumptions resulting in EKPC's total system forecast. Owner-members use their load forecasts as input in developing construction work plans, long-range work plans, and financial forecasts. EKPC uses the load forecast for demand side management analyses, marketing analyses, transmission planning, power supply planning, and financial forecasting.

Factors considered in preparing the forecast include national, regional, and local economic performance, population and housing trends, service area industrial development, electric price, household income, appliance saturations and efficiencies, demand side management programs, and weather.

Key Results

In 2023 EKPC owner-members served approximately 569,000 retail consumers (approximately 1,100,000 member population) in 89 counties in Kentucky and 4 counties in Tennessee, including portions of the Louisville, Cincinnati, Elizabethtown, Lexington, Huntington, and Bowling Green

Metropolitan Statistical Areas (MSA). The forecast indicates that, in the period of 2025 through 2039, total consumers served by owner-members will increase from 580,709 to 634,222, an average of 0.6 percent per year. The Residential Class will continue to be the largest class with respect to consumers and energy use.

Consumer Growth by Class

Time Period	Residential	Seasonal	Small Commercial	Public Buildings	Large Commercial	Public Street / Highway Lighting	Total Consumers
2018 - 2023	1.0%	13.6%	1.5%	0.5%	4.9%	3.6%	1.0%
2025 - 2030	0.7%	0.0%	0.8%	0.8%	1.6%	0.7%	0.7%
2013 - 2023	0.8%	11.2%	1.0%	0.8%	3.7%	1.2%	0.8%
2025 - 2035	0.7%	0.0%	0.7%	0.8%	1.6%	0.6%	0.7%
2009 - 2023	0.7%	-18.1%	0.9%	1.3%	2.4%	0.7%	0.7%
2025 - 2039	0.6%	0.0%	0.7%	0.8%	1.7%	0.6%	0.6%

Note: The Seasonal Sales Class is reported by 1 owner-member. Large percentage changes occur because this is a very small consumer class, resulting in small change in consumer count producing a large percentage change.

EKPC's load forecast projects net total energy requirements to increase from 15.4 to 18.4 million MWh, an average of 1.3 percent per year over the 2025 through 2039 period. Sales to the Residential Class will increase by 1.0 percent per year, small commercial sales (consumers with ≤1000 KVA) will increase by 0.2 percent per year, and large commercial and industrial sales (consumers with >1000 KVA) will increase by 1.6 percent per year.

Energy Sales Growth by Class

Time Period	Residential	Seasonal	Small Commercial	Public Buildings	Large Commercial	Public Street / Highway Lighting	Total Retail Sales	Net Total Requirements
2018 - 2023	-2.1%	11.5%	-0.5%	-2.0%	4.3%	-2.4%	0.0%	-0.2%
2025 - 2030	1.1%	-0.1%	0.2%	0.0%	3.2%	0.1%	1.8%	1.9%
2013 - 2023	-0.5%	13.5%	0.0%	0.0%	3.4%	-2.3%	0.7%	0.6%
2025 - 2035	1.0%	-0.1%	0.1%	0.0%	1.9%	0.1%	1.2%	1.4%
2009 - 2023	-0.2%	-16.4%	0.5%	0.3%	2.9%	-1.1%	0.8%	0.6%
2025 - 2039	1.0%	0.0%	0.2%	0.1%	1.6%	0.1%	1.1%	1.3%

Note: Net Total Requirements include owner-member office use, distribution losses, EKPC facilities use, and transmission losses. For forecast years, Net Total Requirements also include incremental projections for EVs and Demand Side Management / Energy Efficiency (DSM/EE).

Net winter and summer peak demands will increase by approximately 416 MW or 0.8 percent per year and 411 MW or 1.1 percent per year, respectively. Annual load factor projections are expected to increase somewhat from approximately 50 percent to approximately 54 percent.

Historical and projected class sales, total energy requirements, seasonal peak demands, and annual load factor for the EKPC system are presented on the following pages. Peak demands are based on coincident hourly-integrated demand intervals. Load factor is calculated using annual net peak demand and energy requirements.

Coincident Peak Demands and Total Requirements

Historical and Projected

Season	Net Winter Peak Demand (MW)	Year	Net Summer Peak Demand (MW)	Year	Net Total Requirements (MWh)	Load Factor (%)
2013 - 14	3,425	2014	2,192	2014	13,163,516	43.9%
2014 - 15	3,507	2015	2,179	2015	12,604,942	41.0%
2015 - 16	2,890	2016	2,293	2016	13,039,953	51.4%
2016 - 17	2,871	2017	2,311	2017	12,680,111	50.4%
2017 - 18	3,437	2018	2,375	2018	13,576,581	45.1%
2018 - 19	3,073	2019	2,366	2019	13,140,704	48.8%
2019 - 20	2,723	2020	2,312	2020	12,794,457	53.5%
2020 - 21	2,862	2021	2,450	2021	13,183,458	52.6%
2021 - 22	3,017	2022	2,465	2022	13,700,232	51.8%
2022 - 23	3,747	2023	2,497	2023	13,465,331	41.0%
2023 - 24	3,754	2024	2,450	2024	14,597,314	44.3%
2024 - 25	3,517	2025	2,530	2025	15,356,328	49.8%
2025 - 26	3,627	2026	2,588	2026	16,032,547	50.5%
2026 - 27	3,677	2027	2,641	2027	16,324,831	50.7%
2027 - 28	3,712	2028	2,664	2028	16,535,333	50.7%
2028 - 29	3,727	2029	2,688	2029	16,716,466	51.2%
2029 - 30	3,743	2030	2,703	2030	16,836,043	51.3%
2030 - 31	3,760	2031	2,723	2031	16,984,780	51.6%
2031 - 32	3,788	2032	2,749	2032	17,186,440	51.6%
2032 - 33	3,793	2033	2,766	2033	17,291,964	52.0%
2033 - 34	3,811	2034	2,792	2034	17,442,321	52.2%
2034 - 35	3,832	2035	2,818	2035	17,621,587	52.5%
2035 - 36	3,870	2036	2,853	2036	17,880,165	52.6%
2036 - 37	3,882	2037	2,878	2037	18,029,950	53.0%
2037 - 38	3,908	2038	2,910	2038	18,243,593	53.3%
2038 - 39	3,933	2039	2,941	2039	18,446,924	53.5%

- **Impacts from demand side management and energy efficiency programs are included in the projections.**
- **For the winter seasons 2013 – 14 through 2023 – 24 data are historical values.**
- **For the energy and summer seasons 2014 through 2023 data are historical values.**

Energy Sales by Class

Year	Residential Sales (MWh)	Seasonal Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Public Street and Highway Lighting (MWh)	Total Retail Sales (MWh)
2014	7,142,350	370	1,919,198	39,753	3,246,287	9,916	12,357,874
2015	6,781,622	354	1,958,109	38,996	2,979,716	9,890	11,768,687
2016	6,847,090	416	1,951,787	37,627	3,296,495	9,940	12,143,355
2017	6,502,113	534	1,896,475	36,578	3,395,430	9,325	11,840,456
2018	7,324,079	621	1,962,505	41,142	3,425,613	8,796	12,762,756
2019	7,036,916	663	1,925,821	39,829	3,314,391	8,770	12,326,390
2020	6,915,401	662	1,791,061	34,187	3,251,726	8,771	12,001,809
2021	7,127,199	489	1,889,497	38,218	3,367,170	8,249	12,430,821
2022	7,218,271	753	1,940,673	38,012	3,720,863	7,633	12,926,204
2023	6,598,806	1,069	1,915,931	37,126	4,224,079	7,799	12,784,809
2024	7,199,620	1,072	1,982,768	37,832	4,493,900	7,856	13,723,049
2025	7,328,725	1,088	1,999,850	38,507	5,059,501	7,869	14,435,540
2026	7,450,913	1,090	2,012,587	38,536	5,561,242	7,881	15,072,250
2027	7,538,607	1,088	2,015,909	38,518	5,733,336	7,892	15,335,351
2028	7,635,773	1,088	2,025,042	38,536	5,804,062	7,902	15,512,403
2029	7,673,920	1,084	2,022,464	38,582	5,917,462	7,912	15,661,424
2030	7,740,202	1,082	2,020,842	38,561	5,936,225	7,920	15,744,831
2031	7,810,438	1,080	2,020,446	38,554	5,973,393	7,929	15,851,839
2032	7,904,478	1,080	2,026,511	38,584	6,025,132	7,937	16,003,722
2033	7,944,540	1,077	2,022,136	38,644	6,047,860	7,945	16,062,202
2034	8,011,516	1,076	2,023,307	38,640	6,075,940	7,952	16,158,433
2035	8,091,467	1,077	2,025,779	38,645	6,113,131	7,959	16,278,058
2036	8,202,158	1,079	2,035,241	38,691	6,183,108	7,967	16,468,243
2037	8,263,737	1,078	2,036,240	38,783	6,205,528	7,975	16,553,341
2038	8,350,371	1,079	2,043,942	38,813	6,251,672	7,983	16,693,861
2039	8,441,425	1,081	2,051,572	38,847	6,279,417	7,992	16,820,333

Notes:

- **Totals may not equal sum of components due to rounding.**
- **Additional DSM/EE and EV forecasts are not included in class or total retail sales. They are included in EKPC net total requirements.**

Total Energy Requirements

Year	Total Retail Sales (MWh)	Owner-Member Office Use (MWh)	Average Distribution Losses (%)	Sales to Owner Members (MWh)	EKPC Facilities Use (MWh)	Transmission Losses (%)	Total Requirements (MWh)	New Electric Vehicles Base Case (MWh)	DSM/EE (MWh)	Net Total Requirements includes EVs (MWh)
2014	12,357,874	10,497	4.1%	12,898,402	8,246	1.9%	13,163,516			13,163,516
2015	11,768,687	10,008	4.3%	12,303,441	8,190	2.3%	12,604,942			12,604,942
2016	12,143,355	10,270	4.1%	12,674,239	8,203	2.7%	13,039,953			13,039,953
2017	11,840,456	9,992	4.0%	12,340,793	8,374	2.5%	12,680,111			12,680,111
2018	12,762,756	10,647	3.5%	13,238,766	8,451	2.4%	13,576,581			13,576,581
2019	12,326,390	10,232	3.6%	12,798,772	7,891	2.5%	13,140,704			13,140,704
2020	12,001,809	9,444	3.9%	12,499,902	7,313	2.2%	12,794,457			12,794,457
2021	12,430,821	9,206	3.5%	12,886,454	7,631	2.1%	13,183,458			13,183,458
2022	12,926,204	8,758	4.1%	13,488,016	7,529	1.4%	13,700,232			13,700,232
2023	12,784,809	8,133	3.2%	13,211,972	7,207	1.8%	13,465,331			13,465,331
2024	13,723,049	8,596	3.5%	14,228,124	7,514	2.0%	14,520,937	76,377		14,597,314
2025	14,435,540	8,596	3.4%	14,954,336	7,514	2.0%	15,261,702	99,859	-5,232	15,356,328
2026	15,072,250	8,596	3.3%	15,602,661	7,514	2.0%	15,923,021	127,704	-18,177	16,032,547
2027	15,335,351	8,596	3.3%	15,870,588	7,514	2.0%	16,196,317	159,643	-31,129	16,324,831
2028	15,512,403	8,596	3.3%	16,053,804	7,514	2.0%	16,383,205	196,255	-44,127	16,535,333
2029	15,661,424	8,596	3.3%	16,204,972	7,514	2.0%	16,537,403	235,825	-56,761	16,716,466
2030	15,744,831	8,596	3.3%	16,291,658	7,514	2.0%	16,625,826	280,009	-69,792	16,836,043
2031	15,851,839	8,596	3.3%	16,402,956	7,514	2.0%	16,739,355	328,278	-82,852	16,984,780
2032	16,003,722	8,596	3.3%	16,560,979	7,514	2.0%	16,900,544	381,999	-96,103	17,186,440
2033	16,062,202	8,596	3.3%	16,622,110	7,514	2.0%	16,962,900	437,727	-108,663	17,291,964
2034	16,158,433	8,596	3.3%	16,722,102	7,514	2.0%	17,064,896	498,516	-121,091	17,442,321
2035	16,278,058	8,596	3.3%	16,846,686	7,514	2.0%	17,191,978	563,466	-133,857	17,621,587
2036	16,468,243	8,596	3.3%	17,044,352	7,514	2.0%	17,393,605	634,362	-147,802	17,880,165
2037	16,553,341	8,596	3.3%	17,133,164	7,514	2.0%	17,484,197	705,928	-160,175	18,029,950
2038	16,693,861	8,596	3.3%	17,279,360	7,514	2.0%	17,633,323	783,352	-173,082	18,243,593
2039	16,820,333	8,596	3.3%	17,411,162	7,514	2.0%	17,767,766	864,886	-185,729	18,446,924

Note 1: Distribution losses do not apply to direct serve loads.

Note 2: Demand Side Management (DSM) and Energy Efficiency (EE) do not include energy efficiency measures installed prior to 2025 to avoid double counting. These are assumed to be embedded in the historical data.

Note 3: Historical EV energy is embedded in total retail sales.

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Section 2.0
Description of the Cooperative

EKPC is a generation and transmission electric cooperative headquartered in Winchester, Kentucky and owned by its 16 owner-members which include:

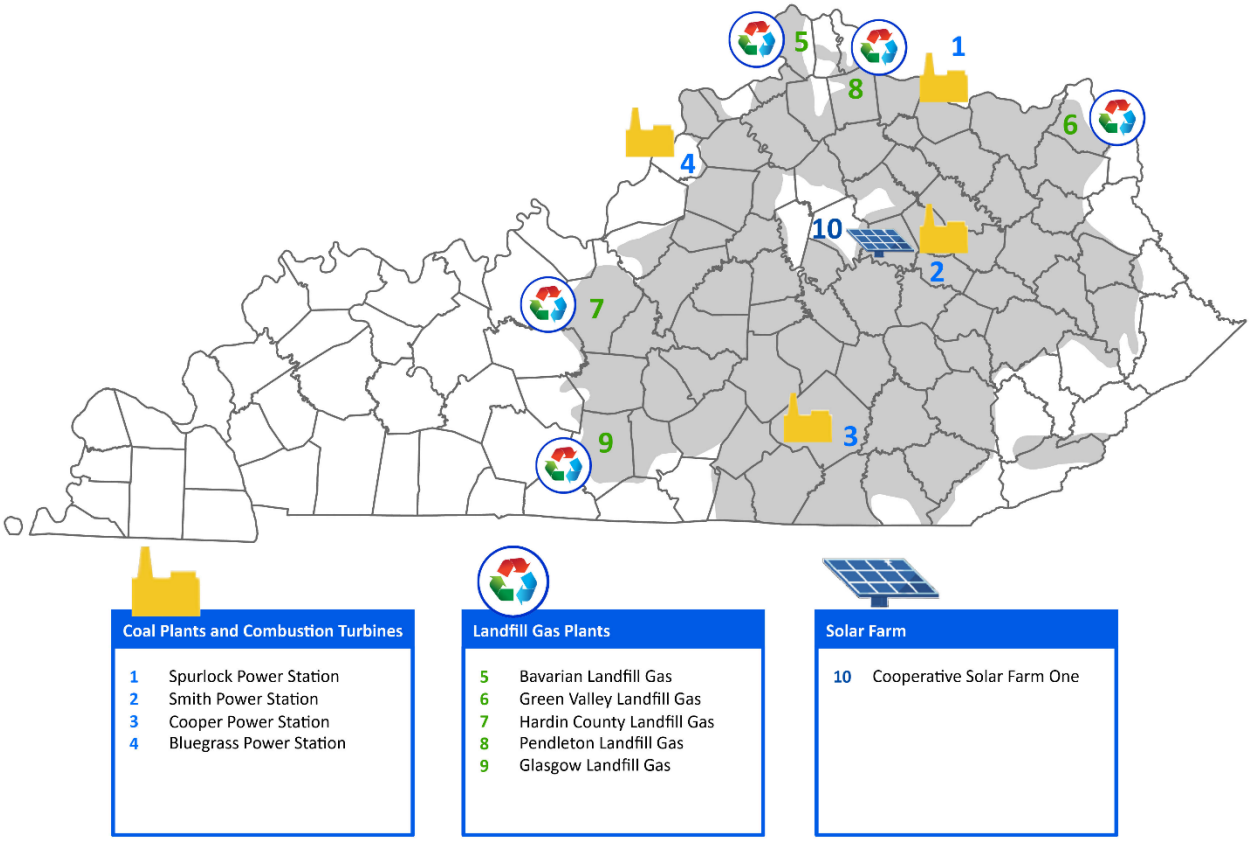
- Big Sandy RECC
- Blue Grass Energy Cooperative
- Clark Energy Cooperative
- Cumberland Valley Electric
- Farmers RECC
- Fleming-Mason Energy Cooperative
- Grayson RECC
- Inter-County Energy Cooperative
- Jackson Energy Cooperative
- Licking Valley RECC
- Nolin RECC
- Owen Electric Cooperative
- Salt River Electric Cooperative
- Shelby Energy Cooperative
- South Kentucky RECC
- Taylor County RECC

EKPC owns a generation fleet of 3,265 MW, including coal, natural gas, oil, solar and landfill gas units. An additional 170 MW of hydropower is purchased from the Southeastern Power Administration (SEPA). EKPC operates within PJM, which has over 180,000 MW of generation capacity. EKPC's all-time peak demand of 3,754 MW occurred on January 17, 2024.

Generation includes (net winter rating):

- Spurlock – 1,346 MW
- Cooper – 341 MW
- Smith Combustion Turbine Units – 989 MW
- Bluegrass Combustion Turbine Units – 567 MW
- Cooperative Solar 1 – 8.5 MW
- SEPA, hydropower – 170 MW
- Landfill Gas Plants
  - Bavarian Landfill– 4.6 MW
  - Green Valley Landfill – 2.3 MW
  - Hardin County Landfill – 2.3 MW
  - Pendleton Landfill – 3.0 MW
  - Glasgow Landfill – 0.9 MW

EKPC owns and operates a 2,995-circuit mile network of high voltage transmission lines consisting of 69 kV, 138 kV, 161 kV, and 345 kV lines, and all the related substations. EKPC is a member of the SERC Reliability Corporation (SERC). EKPC maintains 77 normally closed free-flowing interconnections with its neighboring utilities.



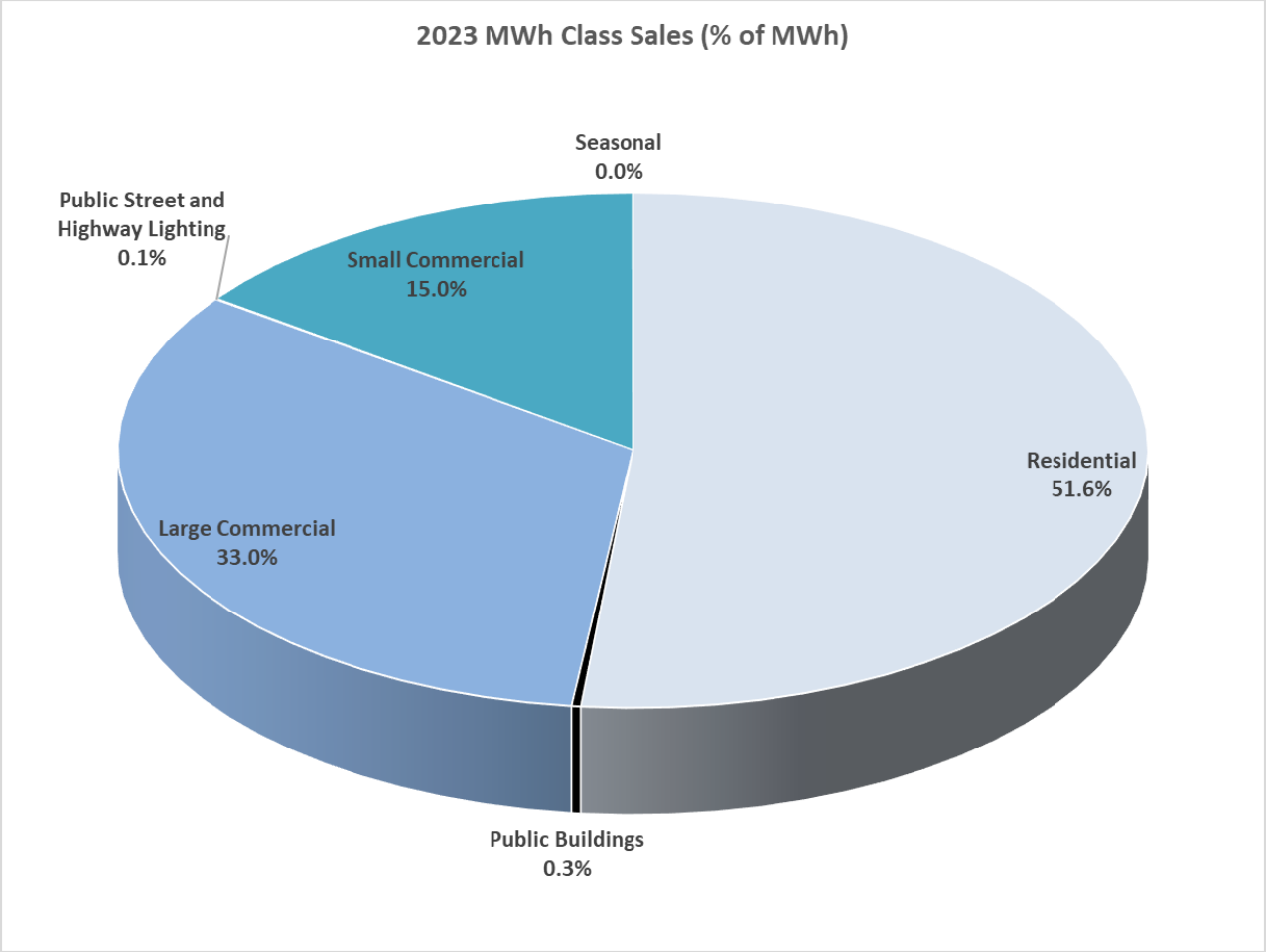
2.1 Owner-Members' Service Territory

In 2023 EKPC owner-members served approximately 569,000 retail consumers (approximately 1,100,000 member population) in 89 counties in Kentucky and 4 counties in Tennessee, including portions of the Louisville, Cincinnati, Elizabethtown, Lexington, Huntington, and Bowling Green Metropolitan Statistical Areas (MSA). EKPC owner-members serve most of the rural areas, while investor-owned and municipal utilities serve most of the cities and towns. Interstates 64, 65, 71, and 75 and several limited-access parkways pass through the area. EKPC owner-members' fixed service territory boundaries are on file with the Kentucky Public Service Commission.

The service territory is diverse. Areas around Lexington and Louisville have a significant amount of manufacturing. The region near Cincinnati contains a growing number of retail trade, transportation, and service jobs. Coal mining has seen strong decreases due to regulatory changes as well as decreased natural gas prices, the most notable impacts being in the eastern and southeastern regions of EKPC's service area. Tourism is an important aspect of the southern and southwestern service area, with Lake Cumberland and Mammoth Cave National Park contributing to jobs in the service and retail trade industries. Kentucky as a whole expects to see growth in the health care sector due to the aging population.

2.2 Consumer Overview

The owner-members' collective consumer base is comprised predominantly of residential consumers, 93 percent. In 2023, 52 percent of EKPC's owner-member retail sales were to the residential class. The 2022 End-Use Survey results indicate electricity is the primary method for water heating, 85 percent, and home heating, 62 percent. Additionally, 96 percent of residential consumers have an AC system. The availability of natural gas is limited in most of the service territory.



Over the past 10 years, residential consumer use averaged 1,139 kWh per month. The forecast projects a slight increase to 1,159 kWh per month during the forecast period, driven by economic growth and increased electric device use partially offset by appliance efficiency improvements.

Section 3.0
Description of the Forecasting Method

3.1 Forecast Process

EKPC's load forecast was prepared pursuant to the Work Plan. Factors considered when preparing the forecast include regional economic growth, electric appliance saturation and efficiency trends, and weather. The EKPC Power Supply Analytics Department works with the staff of each owner-member to prepare its forecast and then aggregates the 16 owner-member forecasts, adds forecasts of EKPC facility use and transmission losses, and subtracts planned demand side management and energy efficiency to create EKPC's system forecast. For the first time, EKPC's 2024 load forecast also includes a projection of EV charging requirements at the EKPC level, developed in collaboration with GDS Associates (GDS).

Owner-members will use the load forecast for long-term planning, including construction work plans and financial forecasts. EKPC will use the load forecast for transmission and generation planning, demand side management and energy efficiency programs, and financial planning.

The general steps followed in developing the load forecast include:

1. Develop regional economic projections: EKPC subscribes to IHS Global Inc., an entity of S&P Global (IHS), to analyze regional economic performance. IHS provides county-level projections for population, employment, income and other variables. EKPC further analyzes the data to appropriately reflect the owner-members' individual service territories.
2. Analyze and construct models: EKPC prepares a preliminary forecast for each of its owner-members for each classification as reported on the Rural Utility Services (RUS) Form 7, which contains retail sales data for owner-members. These classes include: residential, seasonal, small commercial, public buildings, large commercial, and public street and highway lighting. EKPC's sales to owner-members are then determined by adding owner-

member office use and distribution losses to total retail sales. Seasonal peak demands are developed using historical normalized peaks and modeled growth.

3. Incorporate input from the owner-members: EKPC meets with each owner-member to discuss the preliminary forecast. Owner-member staff at these meetings includes the President/CEO and other key individuals.
4. Revise the forecasts: The preliminary forecast is revised based on mutual agreement of EKPC staff and owner-member's President/CEO and staff. This final forecast is approved by the Board of Directors of each owner-member.
5. Develop the system load forecast: The EKPC forecast is the summation of the forecasts of its 16 owner-members with demand side management, energy efficiency, transmission losses, EVs, and EKPC facilities' use incorporated.
6. EKPC's forecast is reviewed and approved by its Board of Directors and submitted to RUS.

There is close collaboration and coordination between EKPC and its owner-members in this process. This working relationship is essential because EKPC has no retail consumers. Input from owner-members relating to industrial development, subdivision growth, and other specific service area information is crucial to the creation of accurate forecasts. Review meetings provide opportunities to critique the assumptions and the overall results of the preliminary forecast. The resulting load forecast reflects a combination of EKPC's structured forecast methodology combined with the judgment and experience of the owner-member staff.

3.2 Forecast Model Structure and Inputs

Consumer and energy models for each class are used to develop load forecasts for each owner-member. The regional economy, consumer and sales trends, appliance saturations, energy efficiency and demand side management impacts, and weather impacts are modeled and analyzed during the forecast study.

Regional Economic Model: EKPC has divided its owner-members' service area into seven economic regions with economic activity projected for each. Some natural regions exist within the EKPC territory. For example, the Central Economic Region defined by EKPC fits closely within

the Lexington Standard Metropolitan Statistical Area (SMSA). The U.S. Bureau of Economic Analysis (BEA) defines SMSAs as areas of interrelated economic activity that go beyond a single county's boundaries. The North Region includes Kentucky counties that border Cincinnati.

Regional forecasts for population, income, and employment are developed and used as variables in consumer or energy models as appropriate. EKPC combines county-level forecasts from IHS into regional economic forecasts based roughly on owner-member service territory boundaries. Owner-members and counties are assigned to regions as follows:

- Central Region:
  Owner-members: Blue Grass Energy Cooperative
  Counties: Anderson, Bourbon, Clark, Fayette, Franklin, Harrison, Jessamine, Madison, Mercer, Scott, and Woodford
- East Region:
  Owner-members: Big Sandy RECC, Cumberland Valley Electric, Jackson Energy Cooperative and Licking Valley RECC
  Counties: Bell, Breathitt, Clay, Estill, Floyd, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lee, Leslie, Letcher, Magoffin, Martin, Morgan, Owsley, Perry, Pike, Rockcastle, Whitley, and Wolfe
- North Region:
  Owner-members: Owen Electric Cooperative
  Counties: Boone, Bracken, Campbell, Carroll, Gallatin, Grant, Kenton, Owen, and Pendleton
- North Central Region:
  Owner-members: Nolin RECC, Salt River Electric Cooperative, and Shelby Energy Cooperative
  Counties: Bullitt, Hardin, Henry, LaRue, Meade, Nelson, Oldham, Shelby, Spencer, Trimble, and Washington
- North East Region:
  Owner-members: Clark Energy Cooperative, Fleming-Mason Energy Cooperative, and Grayson RECC
  Counties: Bath, Boyd, Carter, Elliott, Fleming, Greenup, Lawrence, Lewis, Mason, Menifee, Montgomery, Nicholas, Powell, Robertson, and Rowan
- South Region:
  Owner-members: Inter-County Energy Cooperative, South Kentucky RECC, and Taylor County RECC

Counties: Adair, Boyle, Casey, Clinton, Garrard, Green, Lincoln, Marion, McCreary, Pulaski, Russell, Taylor, and Wayne

- South Central Region:

  Owner-member: Farmers RECC

  Counties: Allen, Barren, Butler, Cumberland, Edmonson, Grayson, Hart, Metcalfe, Monroe, Simpson, and Warren

EKPC utilized a geographic information system from Environmental Systems Research Institute (ESRI) to incorporate owner-members' territories. The county-level economic data provided by IHS is segmented into owner-members' service territories using the mapping of county and service territory boundaries. Economic data that closely represents individual owner-members' territories results in more accurate forecasts.

The load forecast is based on IHS's county-level economic forecasts (IHS Global Inc., an Entity of S&P Global, Market Intelligence, Dataset: Economic Forecast Released March 2024: "US Regional").

County-level historical and projected data provided to EKPC by IHS include:

- North American Industry Classification System (NAICS) Employment
  - Total Non-farm, Non-Manufacturing, Service Providing Private, Construction, Manufacturing, Transportation, Trade & Utilities, Information, Financial Activities, Professional & Business Services, Educational & Health Services, Leisure & Hospitality, Other Services, Government, Federal Government, State & Local Government, Military
- Personal Income
- Real Personal Income
- Population
- Households

These county-level projections combine into regional economic activity. EKPC interpolates a monthly series from IHS's annual county-level projections to include as independent variables in the load forecasting models. Projections of regional economic activity are important determinants of consumer and sales growth.

Consumer and Sales Models: Residential, seasonal energy sales, and the public building class are forecasted using regression analysis. At the owner-member level, energy use per consumer is projected using a statistically adjusted end-use (SAE) model. This method of modeling incorporates end-use forecasts and is used to separate the monthly and annual forecasts into end-use components. SAE models offer the structure of end-use models while also using the strength of time-series analysis. This method, like end-use modeling, requires detailed information about appliance saturation, appliance use, appliance efficiencies, household characteristics, weather characteristics, and demographic and economic data. The SAE approach segments the average household use into end-use components as follows:

$$Use_{y,m} = Heat_{y,m} + Cool_{y,m} + Water\ Heat_{y,m} + Other_{y,m}$$

Where, y=year

m=month

Each component is defined in terms of its end-use structure. For example, the cool index may be defined as a function of appliance saturation, efficiency of the appliance, and usage of the appliance. Annual end-use indices and a usage variable are constructed and used to develop a variable to be used in least squares regression in the model. These variables are constructed for heating, cooling, water heating, and an 'Other' variable, which includes lighting and other miscellaneous usages.

$$CoolIndex_y = \sum_{Type} Wgt^{Type} * \frac{\left(CoolShare_y^{Type} / Eff_y^{Type} \right)}{\left(CoolShare_{by}^{Type} / Eff_{by}^{Type} \right)}$$

$$CoolUse_{y,m} = \left(\frac{CDD_{y,m}}{NormCDD_{by}} \right) * \left(\frac{HHSize_y}{HHSize_{by}} \right) * \left(\frac{Income_y}{Income_{by}} \right) * \left(\frac{Price_{y,m}}{Price_{by}} \right)^{-.30}$$

Where, by=base year; HH Size =Household square footage

$$Cool_{y,m} = CoolIndex_y * CoolUse_{y,m}$$

The Cool, Heat, Water Heat, and Other variables are then used in a least squares regression, which results in estimates for annual and monthly use per household.

The number of residential consumers is also projected with regression analysis using economic variables such as population or households. The owner-member results are summed to determine total consumers and total class sales. Residential, seasonal, and public building energy use per consumer is calculated by dividing the energy sales forecast by the forecast number of consumers. Seasonal sales are only reported by one owner-member. Accounts include seasonal residences, such as vacation homes and weekend retreats. Public building sales are reported by two owner-members and include schools, churches, and community buildings.

Owner-members classify commercial and industrial accounts into two groups. Consumers 1,000 KVA or less are classified as small commercial consumers and consumers over 1,000 KVA are classified as large commercial/industrial consumers. Small commercial energy sales forecast results from regression analysis. The number of small commercial consumers is forecasted by means of regression analysis on various regional economic data. Exogenous variables include employment by sector and economic activity. Energy use per consumer is calculated by dividing the energy sales forecast by the number of consumers.

In the short term, large commercial sales projections rely on the input of the owner-members. Owner-members, having knowledge of their key accounts and the presence of industrial parks, project usage for existing large loads, and advise of new consumers or consumers that are leaving. Additional input from EKPC's Economic Development staff may also be included. In the long-term, energy projections use economic variables as model drivers. EKPC projects new large loads based on history and the economy of the service territory using regression analysis. Historical industrial growth is analyzed to distribute consumer projections among the 16 owner-members. Demand of 1.5 MW and 70 percent load factor is assumed for these new loads. This methodology for forecasting new large commercial consumers and energy provides a robust and defensible projection at the owner-member level as well as the system level.

Public street and highway lighting sales is a relatively small class reported by eleven owner-members. Consumers are correlated with residential consumers. Energy has been decreasing due to upgrading light bulbs to high-efficiency light-emitting diode light bulbs (LEDs).

Demand Side Management, Energy Efficiency Appliance Saturations: EKPC and its 16 owner-members promote the cost-effective use of energy by offering conservation, energy efficiency and other programs to the retail consumer. These programs were designed to meet the needs of the consumer and to delay the need for additional generating capacity. EKPC considers the programs' impacts as part of its overall supply portfolio. Projections of appliance efficiencies are sourced from the Energy Information Administration (EIA) Annual Energy Outlook. EKPC is a member of Itron's Energy Forecasting Group which further analyzes the EIA projections for the East South Central U.S. Census Division and incorporates it into the SAE framework. States included in this division are: Alabama, Kentucky, Mississippi, and Tennessee. These projections, combined with EKPC's End-Use Survey saturations, are used in the models. Every 2-3 years since 1981, EKPC has surveyed its owner-members' residential consumers to gather information on electric appliance saturation, household characteristics, resident demographics, and other factors affecting electricity demand and usage. EKPC projects these saturations for each owner-member as a function of time. The most recent survey was conducted in 2022. Increased appliance efficiency and lighting improvements will have a dampening effect on residential retail sales.

Electricity Rates: The wholesale power costs are based on EKPC projections. Each owner-member provides a projection of the distribution adder for the retail rate assumption used in the individual owner-member models.

Weather: Normal weather is based on historic 20-year values (2003-2023). Owner-members are assigned to weather stations as follows:

- Blue Grass Airport (LEX) in Lexington, KY:
  Owner-members: Blue Grass Energy Cooperative, Clark Energy Cooperative, and Inter-County Energy Cooperative

- Bowling Green/Warren County Regional Airport (BWG) in Bowling Green, KY:
  Owner-members: Farmers RECC and Taylor County RECC
- Cincinnati/Northern Kentucky International Airport (CVG) in Covington, KY:
  Owner-members: Fleming-Mason Energy and Owen Electric Cooperative
- Huntington Tri-State Airport (HTS) in Huntington, WV:
  Owner-member: Grayson RECC
- Jackson County Kentucky Mesonet:
  Owner-member: Jackson Energy Cooperative
- Julian Carroll Airport (JKL) in Jackson, KY:
  Owner-members: Big Sandy RECC, Cumberland Valley Electric, and Licking Valley RECC
- Louisville International Airport (SDF) in Louisville, KY:
  Owner-members: Nolin RECC, Salt River Electric, and Shelby Energy Cooperative
- Pulaski County Airport (SME) in Somerset, KY:
  Owner-member: South Kentucky RECC.

EVs: The EV stock and energy forecasts were developed by GDS. EKPC then used a government agency resource for developing the load profile. All methodologies are described below.

EV Stock (GDS)

The EV stock is a projection of number of EVs that will be owned in each owner-member service territory over time. GDS developed this element of the forecast using information from each owner-member's load forecast (number of consumers), the US Census, the EIA Annual Energy Outlook 2023, and the Bureau of Transportation Statistics. GDS first estimated the total number of vehicles owned by residential consumers for each EKPC owner-member and then estimated EV adoption for new vehicles and replacement of existing vehicles. The overall trend in EV adoption and assumptions about vehicle useful lives are assumed consistent between EKPC's owner-members whereas number of vehicles per household and consumer growth are specific to each owner-member.

EV Energy Sales (GDS)

Determination of total energy sales from EV is based on the EV stock forecast and analysis of the potential electrical consumption for those vehicles over time. EIA data on the share of passenger cars and light duty vehicles (LDV) (pickup trucks, minivans, and SUVs) is used to differentiate the stock. GDS then developed, from its in-house databases, estimates for typical miles driven per year and annual energy consumption per mile driven for charging, with both assumptions differentiated by passenger cars and LDV. The product of stock, miles driven, and kWh per mile results in cumulative EV energy sales for each owner-member.

Load Profile Development (EKPC)

The Alternative Fuels Data Center (AFDC), sponsored by the Department of Energy (DOE), provides typical charging profiles through its EVI-Pro-Lite load profile tool. EKPC used profiles for Lexington-Fayette KY using appropriate assumptions for EKPC consumers:

- ambient temperature by season
- miles driven per day per vehicle
- percentage of all-electric vs plug-in hybrid electric vehicles
- percentage of EV by type (sedans vs. SUVs)
- availability and use of workplace and at-home charging
- access to level 1 and level 2 charging
- charging strategy (timing of charging)

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Section 4.0
Key Assumptions

4.1 Regional Economy Summary

IHS provided the following analysis:

[redacted]

IHS provided the following outlook:

[redacted]

Source for 4.1: IHS Global Inc., an Entity of S&P Global, Market Intelligence, State Analysis – Kentucky (released February 2024).

Overview of Key Economic Variables

See below additional detail using regions as defined in Section 3.2. Population, household, and employment growth are important variables that affect the load forecast.

The source data EKPC used in creating the below charts is IHS Global Inc., an Entity of S&P Global, Market Intelligence, Dataset: Economic Forecast Released March 2024: "US Regional."

[redacted]

[redacted]

[redacted]

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4.2 Results by Region

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[redacted]

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[redacted]

[redacted]

[redacted]

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4.3 Energy and Peak Adjustments

EKPC's owner-member residential sales account for more than 50 percent of all retail sales. To understand the load characteristics of homes, every two to three years since 1981, EKPC has surveyed the owner-members' residential consumers. The most recent survey was conducted in 2022. EKPC gathers appliance, heating and cooling, and demographic data. Appliance holdings of survey respondents are analyzed in order to better understand electricity consumption and to project future appliance saturations.

EKPC, along with its owner-members, conducts a thorough review of the DSM/EE plan every three years in conjunction with EKPC's Integrated Resource Plan (IRP) filing as required by the Kentucky Public Service Commission. EKPC evaluates new potential programs through a multi-step process which includes a technical potential study, stakeholder engagement, and subject matter experts. The results of the DSM/EE plan are incorporated in EKPC's 2024 Load Forecast.

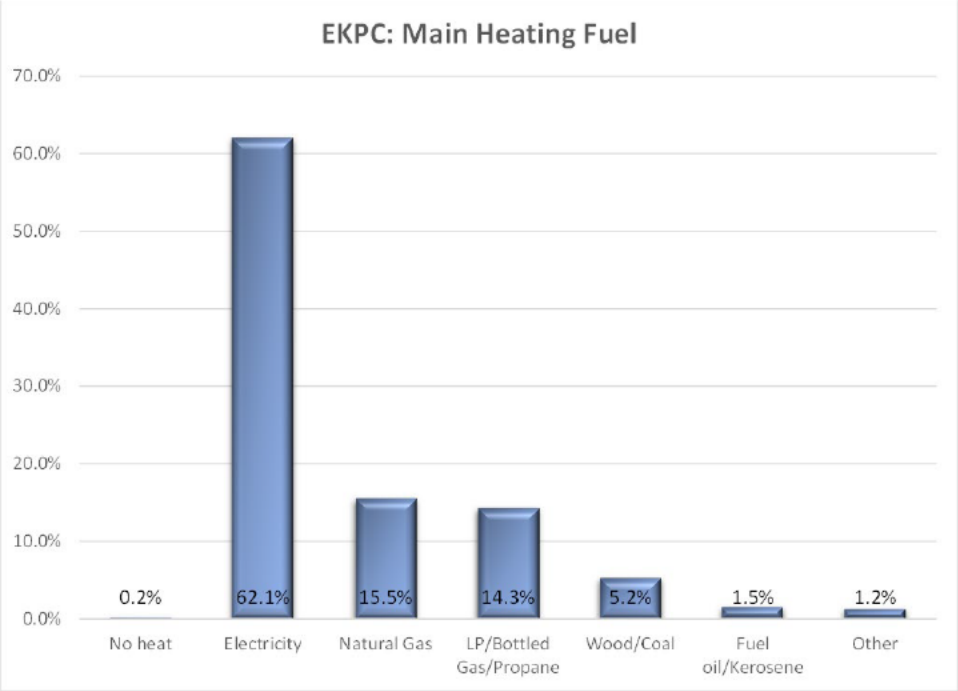
Additional Effect of Demand Side Management and Energy Efficiency Programs

Year	Energy (MWh)	Winter Peak (MW)	Summer Peak (MW)
2025	-5,232	-7	-24
2026	-18,177	-13	-29
2027	-31,129	-19	-33
2028	-44,127	-25	-37
2029	-56,761	-31	-41
2030	-69,792	-38	-45
2031	-82,852	-44	-49
2032	-96,103	-50	-54
2033	-108,663	-56	-58
2034	-121,091	-60	-56
2035	-133,857	-66	-60
2036	-147,802	-72	-64
2037	-160,175	-78	-67
2038	-173,082	-83	-71
2039	-185,729	-89	-74

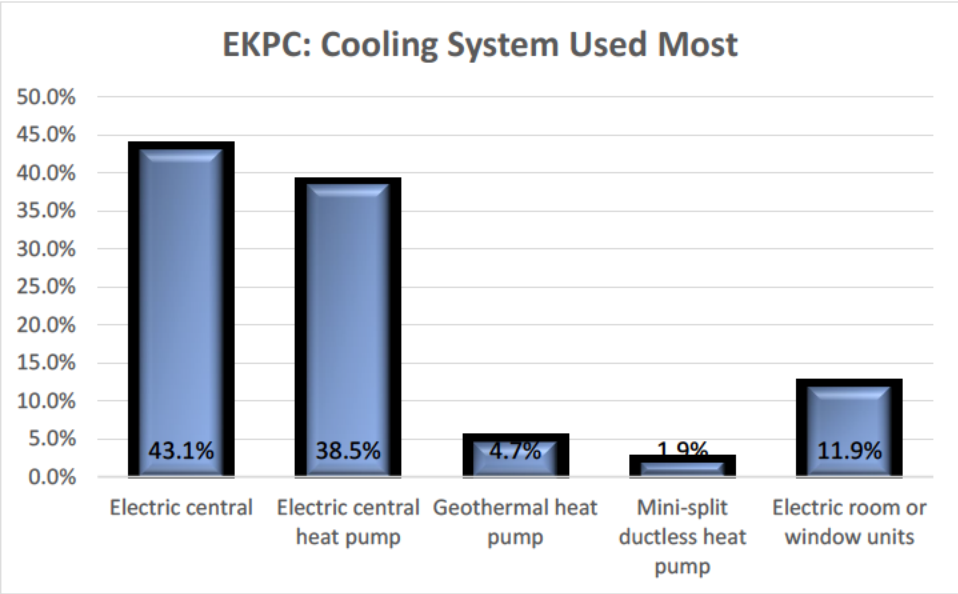
Note: To avoid double counting, additional effects do not include energy efficiency measures installed prior to 2025. These are assumed to be embedded in the historical data.

4.4 Residential Appliance Saturations

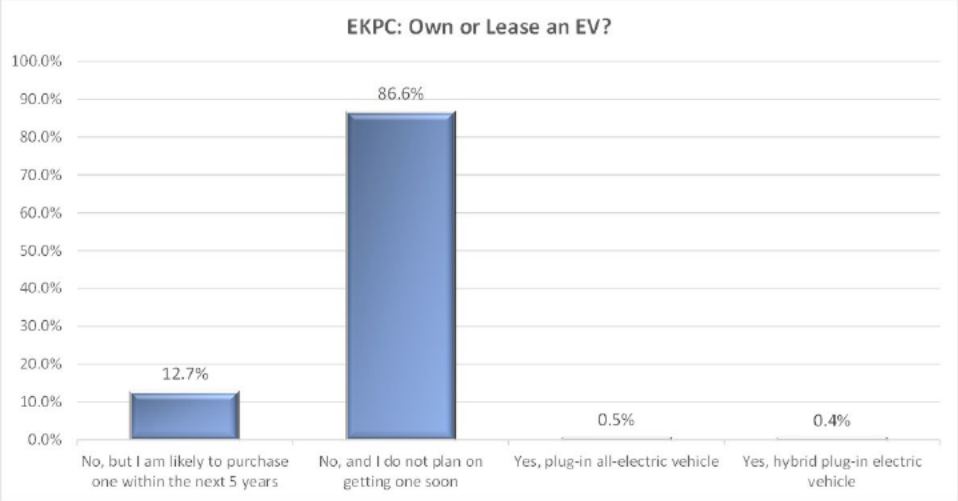
Survey Results – Main Heating Fuel: Due to limited availability of natural gas in EKPC's territory, more than 60 percent of residential consumers use electricity as the main heating fuel for their homes.



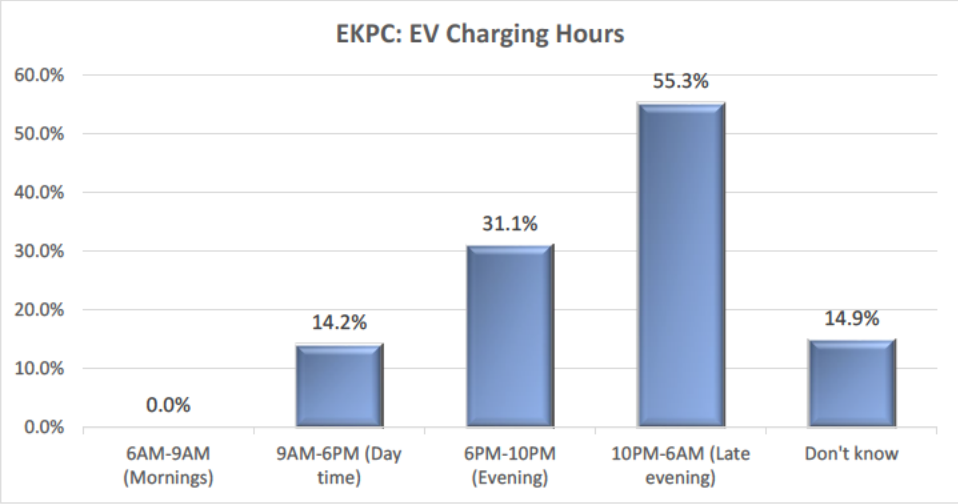
Survey Results – Cooling System: Approximately 96 percent of residential consumers have an AC system. Residential consumers with cooling systems primarily use electric central air conditioning or electric central heat pump systems.



Survey Results – EV: Residential consumers were asked if they owned/leased or are likely to purchase a plug-in electric vehicle. Fewer than 1 percent of residential consumers currently own an EV, and nearly 13 percent are considering one. Nearly 87 percent do not plan on getting an EV soon.



Survey Results – EV Charging Hours: Residential consumers that own or lease an EV charge their vehicles primarily between 10:00 PM and 6:00 AM.



4.5 Energy Efficiency Programs

Existing Programs

- Button-Up Weatherization Program (Residential)
- CARES Low-Income Weatherization (Residential)
- Heat Pump Retrofit Program (Residential)
- Touchstone Energy Program (Residential)
- Direct Load Control of Air Conditioners and Water Heaters: Switches and Bring Your Own Thermostat (BYOT) (Residential)
- EV Off-Peak Charging Program (Residential)

New Programs

- High Efficiency Heat Pump Program (Residential)
- Backup Generator Control Program (Residential)
- Advanced Lighting Program (Commercial)
- Thermostat Program (Commercial & Industrial)

Button-Up Weatherization Program is designed to incentivize end-use members with poor energy-performing homes to improve the energy efficiency of the home's shell and ductwork. The Button-up program is an important program to assist end-use members with high bills caused by excessive heat losses. The Button-Up Program offers an incentive for reducing the heat loss of a home. The incentive is paid based on heat loss reduction measured in British thermal units per hour (Btuh). The Button-Up program encourages homeowners to improve the thermal envelope of their home through improved insulation, upgraded windows/doors, and air-sealing. The program offers a separate incentive for duct sealing.

Community Assistance Resources for Energy Savings (CARES) Low Income Program provides an incentive to enhance the weatherization and energy efficiency services provided to its end-use members by the Kentucky Community Action Agency's (CAA) network of not-for-profit community action agencies or by Kentucky's non-profit affordable housing organizations (AHO). EKPC and its owner-members provide an incentive to the CAA or AHO implementing the project on behalf of the end-use member. EKPC's program has two primary objectives. First, EKPC's incentive will enable the CAA or AHO to install more measures in each home. Second, the additional incentive from EKPC will assist CAA or AHO in weatherizing more homes.

Heat Pump Retrofit Program provides incentives for end-use members to replace their existing resistance heat source (electric furnace, ceiling cable heat, baseboard heat, or electric thermal storage) with a more efficient heat pump. Most high bill complaints are from end-use members with homes that are heated with electric resistive heat instead of a heat pump. Installing an electric heat pump lowers electric bills significantly for those end-use members. The program provides incentives for both ducted systems and mini-split systems. At this time, the program provides incentives for two efficiency levels of ducted heat pump systems: DOE minimum standard heat pumps and ENERGY STAR® standard heat pumps. In recent years, EKPC and the owner-members have seen a sizable increase in mini-split heat pump systems. This heat pump technology is highly efficient. This program provides incentives to install mini-split heat pump systems that replace resistance heat units. These installations must be ENERGY STAR® rated.

Touchstone Energy® Home Program is designed to encourage new homes to be built to higher standards for thermal integrity and equipment efficiency, as well as to choose a geothermal or an air source heat pump rather than less efficient forms of heating and cooling. This program provides guidance during the building process to guarantee a home that is >25-30 percent more efficient than the Kentucky standard built home. The typical home built in rural Kentucky scores a 105 on the Home Energy Rating System (HERS) Index. The HERS testing and rating system is the industry accepted standard for evaluating the energy efficiency of a new home. Therefore, EKPC and the owner-members will provide the incentive for a home that either scores a HERS of 75 or better for the Performance Path or completes a Prescriptive Path check list of energy saving measures that assure the home performs equivalently to a 75 HERS tested home. Plans are submitted to the owner-member staff before the home is built, a pre-drywall inspection is made, and a blower door test is administered after the home is built to verify that the home meets the standard. To qualify as a Touchstone Energy® Home under EKPC's program, the participating home must be located in the service territory of a participating owner-member and must meet the program guidelines following one of the two available paths of approval. All homes must receive a pre-drywall inspection and pass EKPC’s pre-drywall checklist. Homes must also receive

a final inspection and pass a whole house air leakage and duct leakage test. All homes must be heated with an Air Source or Geothermal Heat Pump. In order to meet the prescriptive path requirements, the heat pump must meet or exceed current ENERGY STAR® requirements. Water heaters must be an electric storage tank water heater that meets or exceeds current Energy and Water Conservation standards established by the DOE.

Direct Load Control Program is designed to reduce peak demands to provide load relief to the grid. The objective of the program is to reduce peak demand and energy usage through the installation of thermostats or load control switches controlling air conditioners or heat pumps and load control devices managing water heaters. EKPC controls central air conditioners and heat pumps during extreme peak hours during the summer. Water heater control provides load relief in the winter months as well as in the summer months. EKPC will not install new switches. All new enrollments will be Wi-Fi enabled thermostats provided by the end-use member under the "Bring Your Own Thermostat" (BYOT) option. Existing switches on air conditioners, heat pumps, and water heaters will continue to be controlled and incentives for those units will continue to be paid for the life of the technology. Peak demand reduction is accomplished by cycling equipment on and off according to a predetermined control strategy. Central air conditioning and heat pump units are cycled on and off, while water heater loads are curtailed. For BYOT units, the cycling is accomplished by raising the thermostat setting for the duration of the control event. The typical control duration is four hours for switches and three hours for BYOT units.

Residential EV Off-Peak Charging Program is designed to reduce the growth in peak demand resulting from the adoption of EVs, thereby allowing EKPC to utilize its system more efficiently. EKPC provides a monthly incentive for all registered EV charging energy (kWh) that occurs during the off-peak hours. The program includes energy reporting from EVs or compatible EV supply equipment (EVSE). Prior to joining the program, the owner-members may inspect the end-use member's electrical equipment to ensure compatibility with the energy software program, but

the owner-members shall not be responsible for the installation, repair, or maintenance of the electrical equipment or the EV.

High Efficiency Heat Pump (HEHP) Program offers two incentive levels to end-use members for choosing to install either an air source heat pump (ASHP) that meets or exceeds the current ENERGY STAR® Program requirements product specification for heat pump equipment established by the Environmental Protection Agency (EPA), or by installing a heat pump that has received the EPA cold climate air source heat pump (ccASHP) designation. Heat pump technology has also become available in the area of domestic hot water. The HEHP Program also provides an incentive for end-use members to choose a HEHP water heater over the standard conventional tank or instantaneous water heater.

Backup Generator Control Program incentivizes residential end-use members who own backup generators to participate in EKPC's demand side management initiatives. Generators must meet certain eligibility criteria, including a minimum capacity of 14 kW, the ability to operate for at least 30 continuous hours, carry the entire load of the residence at any time of the year, and the capability for remote control by EKPC. In return, participants will receive an annual availability incentive of $350 and a performance incentive of $100 if the generator is dispatched by EKPC for 25 or more hours. Generators may be dispatched during peak demand periods and in emergency scenarios to alleviate strain on the grid. Participants will receive advance notice when possible, and dispatch events will be limited to 50 hours per year to ensure the long-term reliability of the generators.

Commercial Advanced Lighting Program promotes energy efficiency by incentivizing non-residential end-use members to install high-efficiency LED lighting. This program is available to businesses within EKPC's service territory whose facilities did not exceed 3,000,000 kWh of energy usage in the previous calendar year. This program employs a prescriptive approach, ensuring participants have a clear understanding of the specific incentives available for each type of lighting upgrade.

Commercial & Industrial Thermostat Program is designed to promote energy efficiency by encouraging commercial and industrial end-use members to upgrade to self-learning thermostats. These thermostats are capable of automatically adjusting temperature settings to optimize energy use, leading to significant reductions in heating and cooling costs. The program is available to non-residential end-use members within the service areas of participating EKPC owner-member cooperatives. To qualify, businesses must have a ducted air-source air conditioner or heat pump with a capacity of at least 2 tons, controlled by a single non-self-learning thermostat. Zoned systems are not eligible for the incentive.

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Section 5.0
Results by Consumer Class

Residential Class Consumers and Sales

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	491,708	2,078	0.4	1,210	34	2.9	7,142,350	232,497	3.4
2015	494,254	2,546	0.5	1,143	-67	-5.5	6,781,622	-360,728	-5.1
2016	497,781	3,527	0.7	1,146	3	0.2	6,847,090	65,468	1.0
2017	500,233	2,452	0.5	1,083	-63	-5.5	6,502,113	-344,977	-5.0
2018	505,322	5,089	1.0	1,208	125	11.5	7,324,079	821,967	12.6
2019	508,561	3,239	0.6	1,153	-55	-4.5	7,036,916	-287,163	-3.9
2020	514,083	5,522	1.1	1,121	-32	-2.8	6,915,401	-121,515	-1.7
2021	521,184	7,101	1.4	1,140	19	1.7	7,127,199	211,798	3.1
2022	525,887	4,703	0.9	1,144	4	0.4	7,218,271	91,072	1.3
2023	530,007	4,120	0.8	1,038	-106	-9.3	6,598,806	-619,465	-8.6
2024	535,417	5,410	1.0	1,121	83	8.0	7,199,620	600,814	9.1
2025	540,708	5,291	1.0	1,129	9	0.8	7,328,725	129,105	1.8
2026	545,388	4,680	0.9	1,138	9	0.8	7,450,913	122,188	1.7
2027	549,754	4,366	0.8	1,143	4	0.4	7,538,607	87,693	1.2
2028	553,699	3,945	0.7	1,149	6	0.6	7,635,773	97,166	1.3
2029	557,374	3,675	0.7	1,147	-2	-0.2	7,673,920	38,147	0.5
2030	561,036	3,662	0.7	1,150	2	0.2	7,740,202	66,282	0.9
2031	564,681	3,645	0.6	1,153	3	0.3	7,810,438	70,236	0.9
2032	568,157	3,476	0.6	1,159	7	0.6	7,904,478	94,041	1.2
2033	571,557	3,400	0.6	1,158	-1	-0.1	7,944,540	40,062	0.5
2034	574,842	3,285	0.6	1,161	3	0.3	8,011,516	66,976	0.8
2035	577,962	3,120	0.5	1,167	5	0.5	8,091,467	79,951	1.0
2036	581,045	3,083	0.5	1,176	10	0.8	8,202,158	110,691	1.4
2037	584,167	3,122	0.5	1,179	2	0.2	8,263,737	61,578	0.8
2038	587,200	3,033	0.5	1,185	6	0.5	8,350,371	86,635	1.0
2039	590,097	2,897	0.5	1,192	7	0.6	8,441,425	91,053	1.1

Notes:

- **Totals may not equal sum of components due to rounding.**
- **In 2018, there was a reclassification of approximately 500 consumers from the Small Commercial Class to the Residential Class.**

Seasonal Class Consumers and Sales

	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

Notes:

- **Totals may not equal sum of components due to rounding.**

Public Buildings Class Consumers and Sales

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	1,117	8	0.7	2,966	169	6.1	39,753	2,537	6.8
2015	1,132	15	1.3	2,871	-95	-3.2	38,996	-757	-1.9
2016	1,137	5	0.4	2,758	-113	-3.9	37,627	-1,369	-3.5
2017	1,156	19	1.7	2,637	-121	-4.4	36,578	-1,049	-2.8
2018	1,165	9	0.8	2,943	306	11.6	41,142	4,563	12.5
2019	1,166	1	0.1	2,847	-96	-3.3	39,829	-1,313	-3.2
2020	1,174	8	0.7	2,427	-420	-14.7	34,187	-5,642	-14.2
2021	1,184	10	0.9	2,690	263	10.8	38,218	4,030	11.8
2022	1,187	3	0.3	2,669	-21	-0.8	38,012	-205	-0.5
2023	1,197	10	0.8	2,585	-84	-3.1	37,126	-886	-2.3
2024	1,209	12	1.0	2,608	23	0.9	37,832	706	1.9
2025	1,224	15	1.2	2,622	14	0.5	38,507	675	1.8
2026	1,233	9	0.7	2,605	-17	-0.7	38,536	30	0.1
2027	1,243	10	0.8	2,582	-22	-0.9	38,518	-18	0.0
2028	1,252	9	0.7	2,565	-17	-0.7	38,536	18	0.0
2029	1,263	11	0.9	2,546	-19	-0.8	38,582	46	0.1
2030	1,273	10	0.8	2,524	-21	-0.8	38,561	-21	-0.1
2031	1,282	9	0.7	2,506	-18	-0.7	38,554	-7	0.0
2032	1,292	10	0.8	2,489	-17	-0.7	38,584	30	0.1
2033	1,303	11	0.9	2,471	-17	-0.7	38,644	60	0.2
2034	1,312	9	0.7	2,454	-17	-0.7	38,640	-4	0.0
2035	1,322	10	0.8	2,436	-18	-0.7	38,645	5	0.0
2036	1,331	9	0.7	2,422	-14	-0.6	38,691	45	0.1
2037	1,342	11	0.8	2,408	-14	-0.6	38,783	92	0.2
2038	1,352	10	0.7	2,392	-16	-0.7	38,813	30	0.1
2039	1,361	9	0.7	2,379	-14	-0.6	38,847	34	0.1

Note: Totals may not equal sum of components due to rounding.

Small Commercial Class Consumers and Sales

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	33,687	395	1.2	57	-1	-1.7	1,919,198	1,468	0.1
2015	34,122	435	1.3	57	0	0.0	1,958,109	38,912	2.0
2016	34,258	136	0.4	57	0	0.0	1,951,787	-6,322	-0.3
2017	34,481	223	0.7	55	-2	-3.5	1,896,475	-55,312	-2.8
2018	34,208	-273	-0.8	57	2	3.6	1,962,505	66,030	3.5
2019	34,514	306	0.9	56	-1	-1.8	1,925,821	-36,684	-1.9
2020	34,742	228	0.7	52	-4	-7.1	1,791,061	-134,760	-7.0
2021	35,263	521	1.5	54	2	3.8	1,889,497	98,436	5.5
2022	36,169	906	2.6	54	0	0.0	1,940,673	51,176	2.7
2023	36,937	768	2.1	52	-2	-3.7	1,915,931	-24,742	-1.3
2024	37,401	464	1.3	53	1	1.9	1,982,768	66,837	3.5
2025	37,810	409	1.1	53	0	0.0	1,999,850	17,081	0.9
2026	38,184	374	1.0	53	0	0.0	2,012,587	12,738	0.6
2027	38,511	327	0.9	52	-1	-1.9	2,015,909	3,322	0.2
2028	38,825	314	0.8	52	0	0.0	2,025,042	9,132	0.5
2029	39,115	290	0.7	52	0	0.0	2,022,464	-2,577	-0.1
2030	39,398	283	0.7	51	-1	-1.9	2,020,842	-1,623	-0.1
2031	39,676	278	0.7	51	0	0.0	2,020,446	-396	0.0
2032	39,943	267	0.7	51	0	0.0	2,026,511	6,066	0.3
2033	40,207	264	0.7	50	-1	-2.0	2,022,136	-4,376	-0.2
2034	40,465	258	0.6	50	0	0.0	2,023,307	1,171	0.1
2035	40,712	247	0.6	50	0	0.0	2,025,779	2,471	0.1
2036	40,956	244	0.6	50	0	0.0	2,035,241	9,462	0.5
2037	41,205	249	0.6	49	-1	-2.0	2,036,240	1,000	0.0
2038	41,454	249	0.6	49	0	0.0	2,043,942	7,701	0.4
2039	41,696	242	0.6	49	0	0.0	2,051,572	7,631	0.4

Notes:

- **Totals may not equal sum of components due to rounding.**
- **In 2018, there was a reclassification of approximately 500 consumers from the Small Commercial Class to the Residential Class.**

Large Commercial Class Consumers and Sales

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	136	1	0.7	23,870	1,515	6.8	3,246,287	228,362	7.6
2015	129	-7	-5.1	23,099	-771	-3.2	2,979,716	-266,571	-8.2
2016	138	9	7.0	23,888	789	3.4	3,296,495	316,779	10.6
2017	149	11	8.0	22,788	-1,100	-4.6	3,395,430	98,935	3.0
2018	153	4	2.7	22,390	-398	-1.7	3,425,613	30,183	0.9
2019	156	3	2.0	21,246	-1,144	-5.1	3,314,391	-111,222	-3.2
2020	165	9	5.8	19,707	-1,539	-7.2	3,251,726	-62,665	-1.9
2021	173	8	4.8	19,463	-244	-1.2	3,367,170	115,444	3.6
2022	184	11	6.4	20,222	759	3.9	3,720,863	353,692	10.5
2023	194	10	5.4	21,774	1,552	7.7	4,224,079	503,216	13.5
2024	202	8	4.1	22,247	473	2.2	4,493,900	269,822	6.4
2025	213	11	5.4	23,754	1,506	6.8	5,059,501	565,600	12.6
2026	217	4	1.9	25,628	1,874	7.9	5,561,242	501,741	9.9
2027	220	3	1.4	26,061	433	1.7	5,733,336	172,094	3.1
2028	225	5	2.3	25,796	-265	-1.0	5,804,062	70,726	1.2
2029	229	4	1.8	25,840	45	0.2	5,917,462	113,400	2.0
2030	231	2	0.9	25,698	-143	-0.6	5,936,225	18,762	0.3
2031	235	4	1.7	25,419	-279	-1.1	5,973,393	37,168	0.6
2032	240	5	2.1	25,105	-314	-1.2	6,025,132	51,739	0.9
2033	243	3	1.3	24,888	-216	-0.9	6,047,860	22,728	0.4
2034	246	3	1.2	24,699	-189	-0.8	6,075,940	28,080	0.5
2035	250	4	1.6	24,453	-246	-1.0	6,113,131	37,191	0.6
2036	257	7	2.8	24,059	-394	-1.6	6,183,108	69,977	1.1
2037	260	3	1.2	23,867	-191	-0.8	6,205,528	22,420	0.4
2038	265	5	1.9	23,591	-276	-1.2	6,251,672	46,144	0.7
2039	268	3	1.1	23,431	-161	-0.7	6,279,417	27,744	0.4

Note: Totals may not equal sum of components due to rounding.

Public Street and Highway Lighting Class Consumers and Sales

	Consumers			*Use Per Consumer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2014	408	-4	-1.0	24	0	1.7	9,916	72	0.7
2015	411	3	0.7	24	0	-1.0	9,890	-26	-0.3
2016	404	-7	-1.7	25	1	2.2	9,940	50	0.5
2017	381	-23	-5.7	24	0	-0.5	9,325	-615	-6.2
2018	390	9	2.4	23	-2	-7.9	8,796	-530	-5.7
2019	408	18	4.6	21	-1	-4.7	8,770	-25	-0.3
2020	432	24	5.9	20	-1	-5.5	8,771	1	0.0
2021	448	16	3.7	18	-2	-9.3	8,249	-523	-6.0
2022	450	2	0.4	17	-1	-7.9	7,633	-616	-7.5
2023	465	15	3.3	17	0	-1.1	7,799	166	2.2
2024	469	4	0.9	17	0	-0.1	7,856	58	0.7
2025	471	2	0.4	17	0	-0.3	7,869	13	0.2
2026	474	3	0.6	17	0	-0.5	7,881	12	0.2
2027	478	4	0.8	17	0	-0.7	7,892	11	0.1
2028	481	3	0.6	16	0	-0.5	7,902	10	0.1
2029	484	3	0.6	16	0	-0.5	7,912	9	0.1
2030	488	4	0.8	16	0	-0.7	7,920	9	0.1
2031	491	3	0.6	16	0	-0.5	7,929	8	0.1
2032	494	3	0.6	16	0	-0.5	7,937	8	0.1
2033	497	3	0.6	16	0	-0.5	7,945	8	0.1
2034	500	3	0.6	16	0	-0.5	7,952	7	0.1
2035	502	2	0.4	16	0	-0.3	7,959	7	0.1
2036	505	3	0.6	16	0	-0.5	7,967	8	0.1
2037	508	3	0.6	16	0	-0.5	7,975	8	0.1
2038	512	4	0.8	16	0	-0.7	7,983	8	0.1
2039	515	3	0.6	16	0	-0.5	7,992	8	0.1

Note: Totals may not equal sum of components due to rounding.

Section 6.0
Results by Owner-Member

		Consumers		Total Energy Sales	
Owner-Member	**Economic Region**	**Portion of System Total**	**Growth Rate 2025 - 2039**	**Portion of System Total**	**Growth Rate 2025 - 2039**
Big Sandy RECC	East	2.1%	0.2%	2.0%	0.2%
Blue Grass Energy	Central	11.3%	0.8%	9.7%	1.0%
Clark Energy	North East	4.8%	0.5%	3.1%	0.4%
Cumberland Valley Electric	East	4.0%	0.2%	3.6%	0.6%
Farmers RECC	South Central	4.6%	0.5%	3.4%	1.0%
Fleming-Mason Energy	North East	4.5%	0.6%	6.4%	0.5%
Grayson RECC	North East	2.6%	0.1%	1.6%	0.7%
Inter-County Energy	South	4.7%	0.3%	4.8%	1.2%
Jackson Energy	East	9.0%	0.4%	7.7%	0.8%
Licking Valley RECC	East	3.0%	0.1%	2.7%	2.3%
Nolin RECC	North Central	6.8%	0.8%	5.7%	1.4%
Owen Electric	North	12.2%	1.2%	21.9%	1.0%
Salt River Electric	North Central	10.1%	0.9%	9.1%	1.3%
Shelby Energy	North Central	3.2%	0.8%	5.9%	3.1%
South Kentucky RECC	South	12.1%	0.4%	8.5%	0.8%
Taylor County RECC	South	4.9%	0.7%	4.0%	1.3%

Note:
System totals may not sum to 100 percent due to rounding.
DSM/EE and EV projections are included in the EKPC system forecast and not broken down by owner-member.

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Section 7.0
Weather, EV, and Economic Scenarios

EKPC's high and low energy and demand scenarios are summarized below. Sensitivities are considered for different economic, weather, and EV scenarios.

High Case - Economic Optimistic:

Compared to the base case forecast, the high case assumes an optimistic economic forecast with both industrial (large commercial) and non-industrial growth exceeding base assumptions.

- Industrial/Large Commercial: 90 MW of additional industrial load at a 70 percent load factor (first half in 2025, second half in 2026).
- All other consumer classes: consumer counts growing 50 percent faster than the base case beginning in 2024. For this scenario, the faster growth rate is applied by consumer class and by year (for example residential consumer growth changes from 1.0 percent to 1.5 percent in 2025 and from 0.8 percent to 1.2 percent in 2027).

High Case – Extreme Weather

The high case for energy assumes extreme weather based on the 30-year historical maximum degree days. The high case for demand is based on a 1 in 30 weather event. The LEX weather station, which is central to Kentucky, is used for identifying normal degree days, and mild and extreme temperatures.

High Case – EVs

The high case assumes stronger EV adoption and more miles/year/vehicle than the base case.

Low Case - Economic Pessimistic:

Compared to the base case forecast, the low case assumes a pessimistic economic forecast with both industrial (large commercial) and non-industrial growth falling below base assumptions.

- Industrial/Large Commercial: loss of 90 MW of industrial load at a 70 percent load factor (first half in 2025, second half in 2026).

- All other consumer classes: consumer counts growing 50 percent slower than the base case beginning in 2024. For this scenario, the slower growth rate is applied by consumer class and by year (for example residential consumer growth changes from 1.0 percent to 0.5 percent in 2025 and from 0.8 percent to 0.4 percent in 2027).

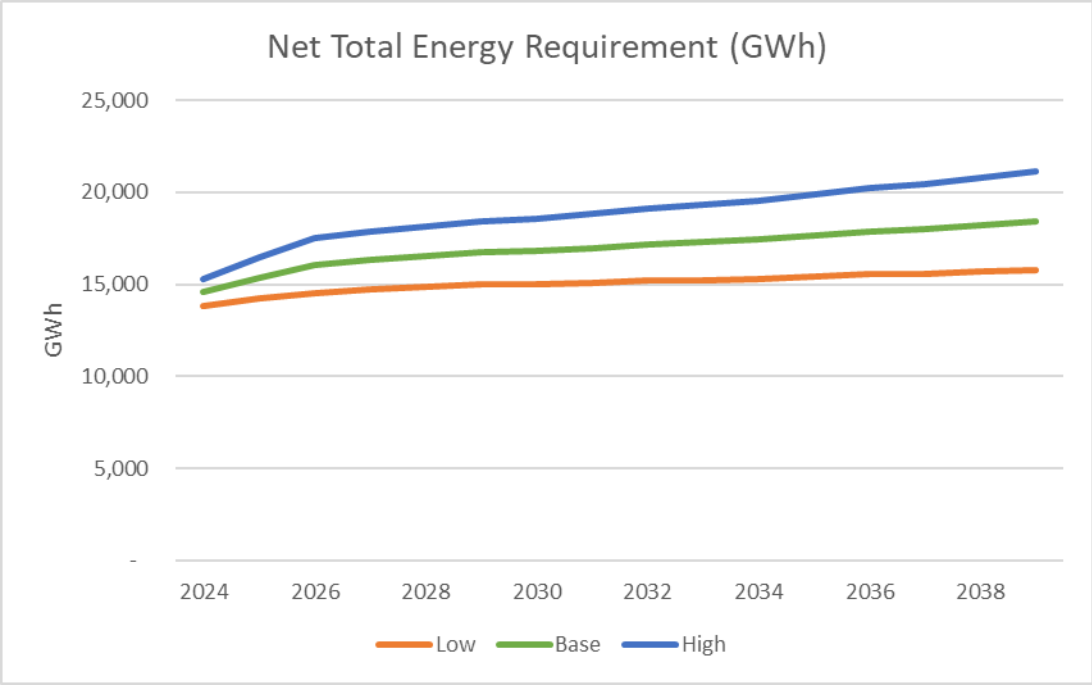
Low Case – Mild Weather

The low case for energy assumes mild weather based on the 30-year historical minimum degree days. The low case for demand is based on a 1 in 30 weather event. The LEX weather station, which is central to Kentucky, is used for identifying normal degree days, and mild and extreme temperatures.

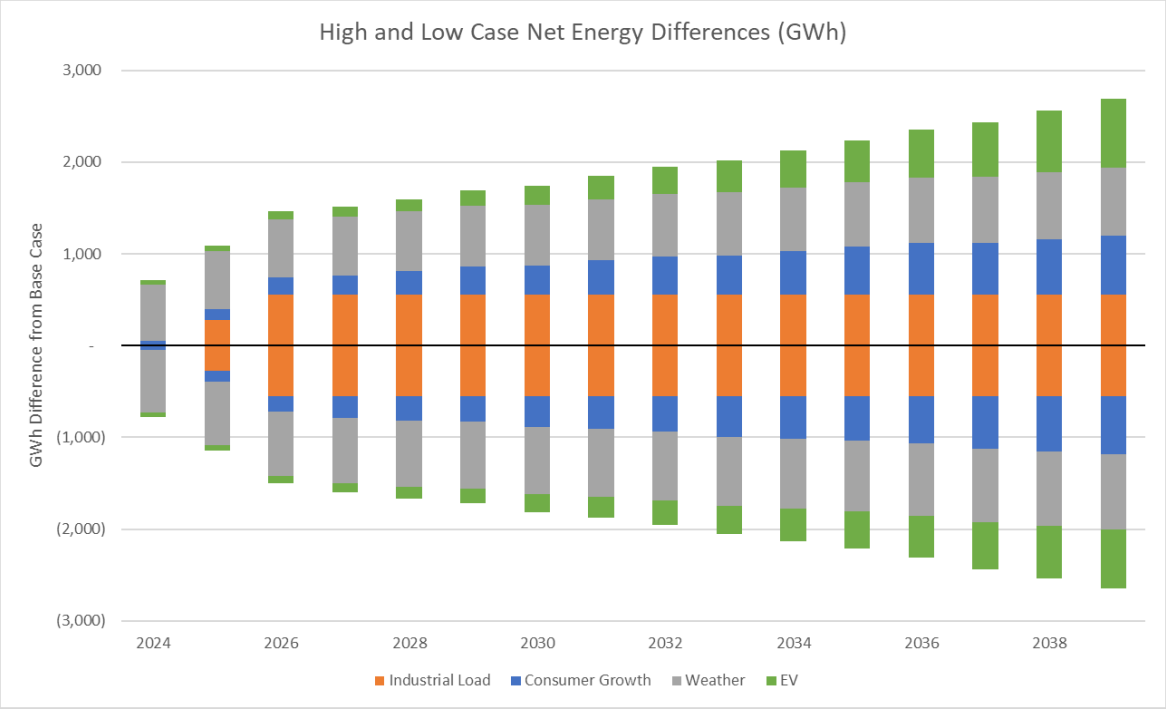
Low Case – EVs

The low case assumes lower EV adoption and fewer miles/year/vehicle than the base case.

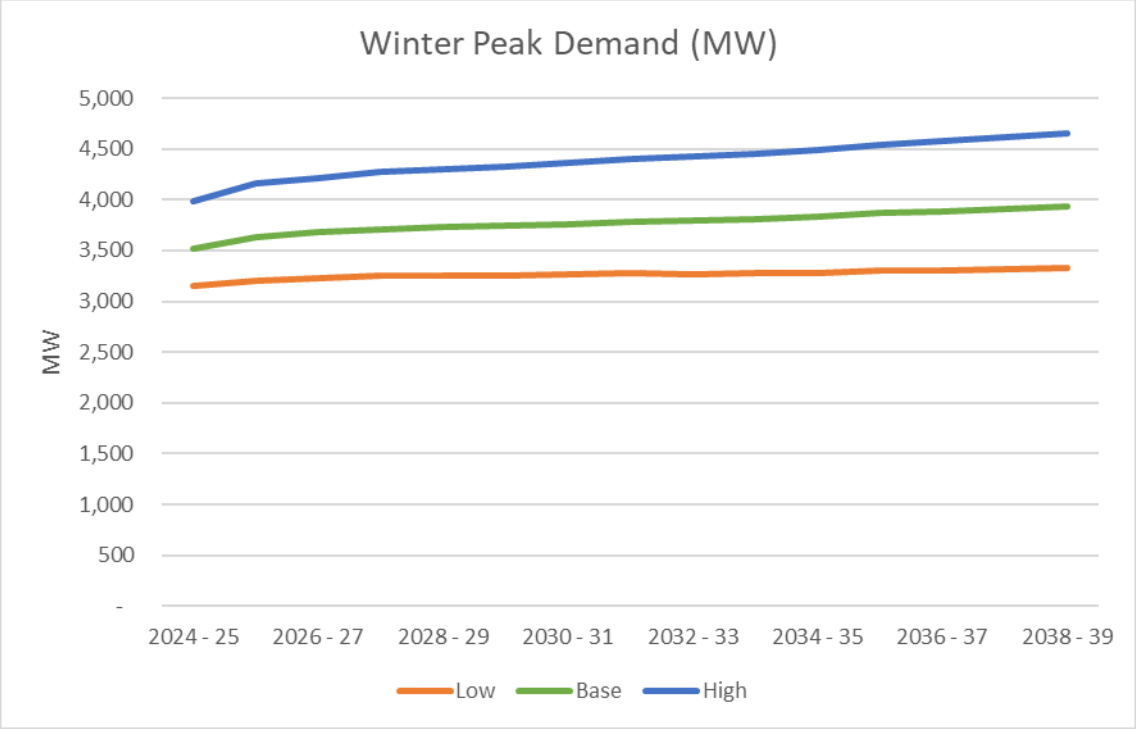
Net Total Energy Requirements (GWh) by Scenario



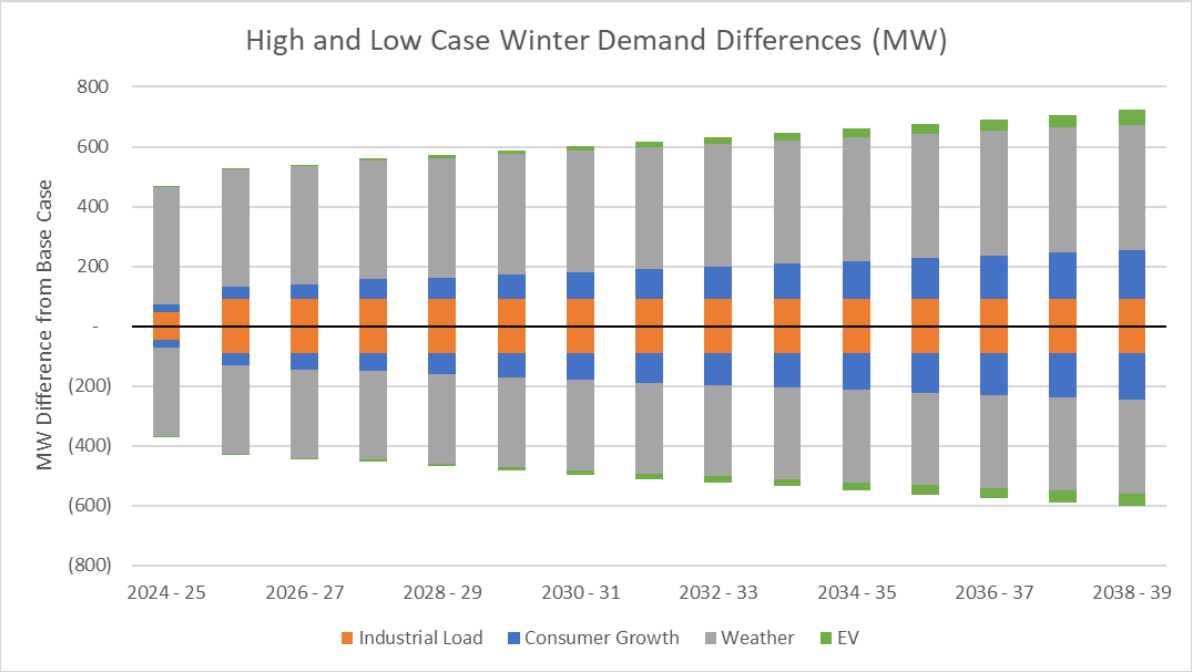
Net Total Energy Requirements (GWh)			
Year	**Low**	**Base**	**High**
2024	13,818	14,597	15,309
2025	14,213	15,356	16,442
2026	14,531	16,033	17,493
2027	14,727	16,325	17,833
2028	14,871	16,535	18,130
2029	15,002	16,716	18,403
2030	15,024	16,836	18,579
2031	15,109	16,985	18,830
2032	15,232	17,186	19,135
2033	15,235	17,292	19,306
2034	15,309	17,442	19,567
2035	15,407	17,622	19,861
2036	15,566	17,880	20,237
2037	15,590	18,030	20,464
2038	15,703	18,244	20,802
2039	15,802	18,447	21,135



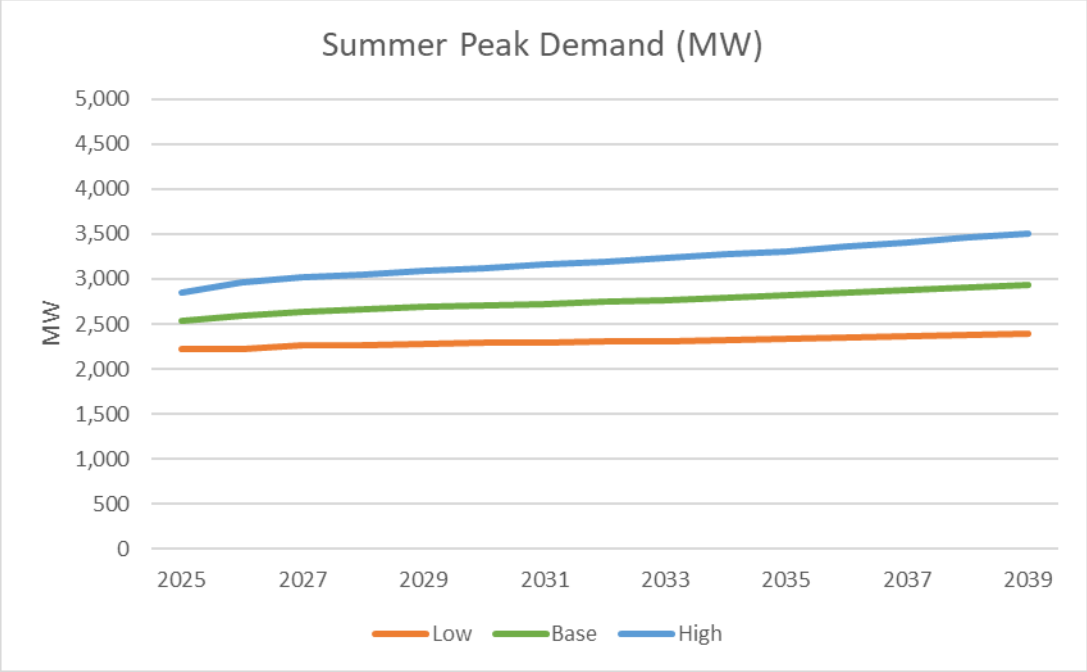
Net Winter Peak Demand (MW) by Scenario



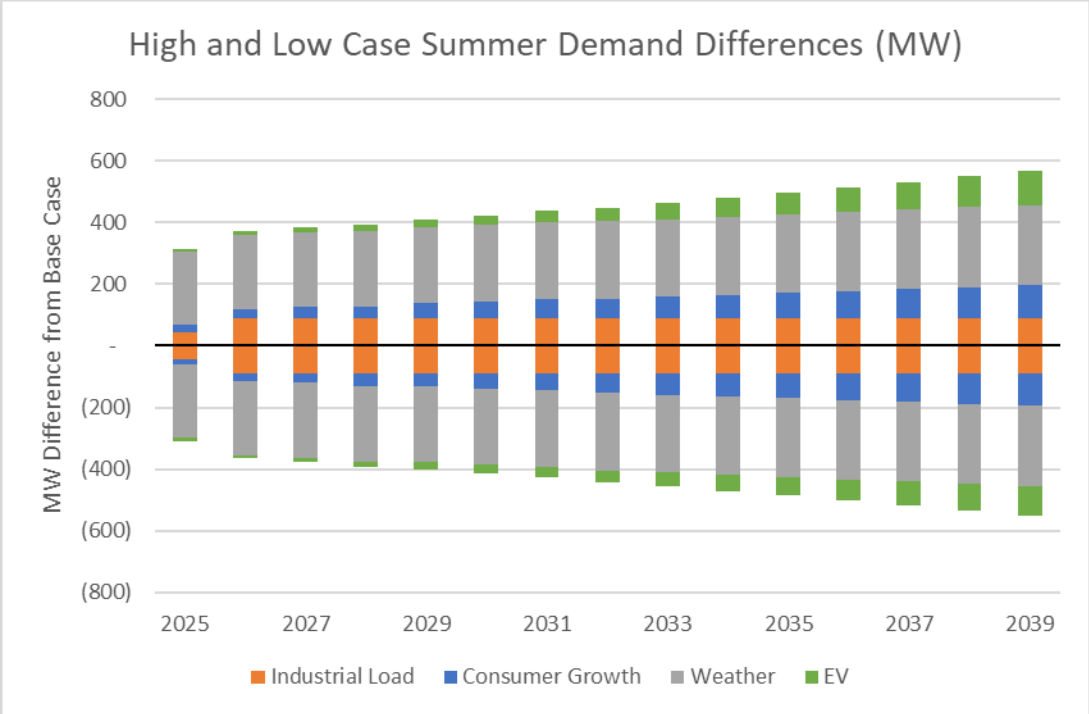
Winter Peak MW			
Year	**Low**	**Base**	**High**
2024 - 25	3,148	3,517	3,984
2025 - 26	3,197	3,627	4,155
2026 - 27	3,231	3,677	4,217
2027 - 28	3,258	3,712	4,272
2028 - 29	3,258	3,727	4,298
2029 - 30	3,259	3,743	4,331
2030 - 31	3,262	3,760	4,362
2031 - 32	3,277	3,788	4,406
2032 - 33	3,270	3,793	4,425
2033 - 34	3,275	3,811	4,458
2034 - 35	3,283	3,832	4,493
2035 - 36	3,307	3,870	4,546
2036 - 37	3,307	3,882	4,574
2037 - 38	3,319	3,908	4,615
2038 - 39	3,331	3,933	4,655


High and Low Case Winter Demand Differences (MW)
MW Difference from Base Case
800
600
400
200
-
(200)
(400)
(600)
(800)
2024 - 25
2026 - 27
2028 - 29
2030 - 31
2032 - 33
2034 - 35
2036 - 37
2038 - 39
Industrial Load
Consumer Growth
Weather
EV

Net Summer Peak Demand (MW) by Scenario



Summer Peak (MW)			
Year	**Low**	**Base**	**High**
2025	2,222	2,530	2,845
2026	2,223	2,588	2,960
2027	2,263	2,641	3,024
2028	2,269	2,664	3,054
2029	2,286	2,688	3,096
2030	2,289	2,703	3,124
2031	2,297	2,723	3,160
2032	2,305	2,749	3,196
2033	2,308	2,766	3,228
2034	2,321	2,792	3,271
2035	2,332	2,818	3,312
2036	2,351	2,853	3,365
2037	2,361	2,878	3,408
2038	2,377	2,910	3,459
2039	2,391	2,941	3,509


High and Low Case Summer Demand Differences (MW)
MW Difference from Base Case
800
600
400
200
-
(200)
(400)
(600)
(800)
2025
2027
2029
2031
2033
2035
2037
2039
Industrial Load
Consumer Growth
Weather
EV