Shelby Energy Cooperative, Inc.

2020 Load Forecast
November 2020
Prepared by: EKPC's Load Forecasting Department

Shelby Energy Cooperative
A Touchstone Energy Cooperative

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Table of Contents

	Page Number
Introduction and Executive Summary	3
Narrative	9
Key Assumptions	13
Methodology and Results	17
- Residential Forecast	20
- Residential Seasonal Forecast	22
- Small Commercial	24
- Large Commercial	26
- Public Street & Highway Lighting	28
- Peak Day Weather Scenarios	30

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 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 national and local economy, population and housing trends, service area industrial development, electric price, 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 reported beginning on page 13.

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 three-year 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 Shelby Energy is reported in Table 1-1 on pages 5 and 6. Residential and commercial sales, total purchases, winter and summer peak demands, and load factor are presented for the years 2010 through 2040.

Table 1-1
MWh Summary

Year	Residential Sales (MWh)	Seasonal Sales (MWh)	Small Comm. Sales (MWh)	Public Buildings (MWh)	Large Comm. Sales (MWh)	Public Street / Highway Lighting Sales (MWh)	Total Sales (MWh)	Office Use (MWh)	% Loss	Purchased Power (MWh)
2010	251,446	0	61,710	0	155,118	185	468,458	0	4.2	489,186
2011	248,173	0	54,853	0	149,799	277	453,102	0	2.6	465,402
2012	220,786	227	66,785	0	162,324	252	450,374	0	3.7	467,695
2013	233,504	300	66,932	0	164,308	162	465,207	0	3.4	481,531
2014	241,615	370	81,069	0	159,527	192	482,774	0	3.5	500,440
2015	229,816	354	85,496	0	164,344	193	480,203	0	3.6	498,300
2016	232,772	416	90,937	0	174,816	186	499,126	0	3.3	516,351
2017	224,148	534	88,841	0	171,067	170	484,761	0	3.2	500,696
2018	247,767	621	89,086	0	166,965	159	504,599	0	3.9	524,856
2019	242,995	663	89,400	0	164,702	145	497,905	0	3.5	516,055
2020	246,103	673	82,936	0	150,378	145	480,234	0	3.5	497,679
2021	252,228	744	96,965	0	145,855	145	495,937	0	3.5	513,952
2022	255,529	787	98,905	0	149,606	145	504,972	0	3.5	523,315
2023	258,151	830	100,883	0	162,772	145	522,781	0	3.5	541,772
2024	260,704	875	102,800	0	165,555	145	530,079	0	3.5	549,335
2025	263,895	921	104,753	0	167,198	145	536,911	0	3.5	556,415
2026	267,201	970	106,743	0	168,104	145	543,162	0	3.5	562,893
2027	270,915	1,024	108,771	0	168,659	145	549,514	0	3.5	569,476
2028	274,448	1,079	110,838	0	168,923	145	555,432	0	3.5	575,609
2029	277,919	1,126	112,944	0	169,305	145	561,439	0	3.5	581,834
2030	282,117	1,172	115,090	0	169,763	145	568,286	0	3.5	588,930
2031	286,684	1,222	117,276	0	170,085	145	575,412	0	3.5	596,315
2032	291,499	1,274	119,505	0	179,489	145	591,912	0	3.5	613,414
2033	295,586	1,325	121,775	0	179,921	145	598,752	0	3.5	620,502
2034	300,339	1,374	124,089	0	180,468	145	606,415	0	3.5	628,444
2035	305,517	1,427	126,447	0	180,946	145	614,481	0	3.5	636,803
2036	311,824	1,487	128,849	0	181,507	145	623,812	0	3.5	646,472
2037	316,707	1,534	131,297	0	182,007	145	631,690	0	3.5	654,637
2038	322,568	1,587	133,792	0	182,606	145	640,697	0	3.5	663,972
2039	328,340	1,641	136,334	0	183,240	145	649,699	0	3.5	673,300
2040	334,738	1,699	138,924	0	183,906	145	659,412	0	3.5	683,366

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

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 (%)	Temperature at time of Winter Peak	Temperature at time of Summer Peak
2009 - 10	102.0	2010	95.9	2010	489,186	54.7%	11° F	102° F
2010 - 11	108.4	2011	99.0	2011	465,402	49.0%	14° F	97° F
2011 - 12	96.5	2012	97.8	2012	467,695	54.4%	17° F	104° F
2012 - 13	100.7	2013	89.9	2013	481,531	54.6%	11° F	94° F
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	497,679	53.5%	16° F	95° F
2020 - 21	123.8	2021	98.6	2021	513,952	47.4%		
2021 - 22	125.7	2022	100.1	2022	523,315	47.5%		
2022 - 23	128.6	2023	103.1	2023	541,772	48.1%		
2023 - 24	130.5	2024	104.6	2024	549,335	47.9%		
2024 - 25	132.5	2025	106.2	2025	556,415	47.9%		
2025 - 26	134.3	2026	107.6	2026	562,893	47.8%		
2026 - 27	136.2	2027	109.1	2027	569,476	47.7%		
2027 - 28	138.1	2028	110.7	2028	575,609	47.5%		
2028 - 29	140.0	2029	112.2	2029	581,834	47.4%		
2029 - 30	141.9	2030	113.7	2030	588,930	47.4%		
2030 - 31	143.9	2031	115.3	2031	596,315	47.3%		
2031 - 32	146.9	2032	118.4	2032	613,414	47.5%		
2032 - 33	149.0	2033	120.1	2033	620,502	47.6%		
2033 - 34	151.0	2034	121.7	2034	628,444	47.5%		
2034 - 35	153.1	2035	123.4	2035	636,803	47.5%		
2035 - 36	155.2	2036	125.1	2036	646,472	47.4%		
2036 - 37	157.4	2037	126.8	2037	654,637	47.5%		
2037 - 38	159.6	2038	128.6	2038	663,972	47.5%		
2038 - 39	161.8	2039	130.4	2039	673,300	47.5%		
2039 - 40	164.0	2040	132.2	2040	683,366	47.4%		

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Executive Summary *(continued)*

Overall Results

- Total sales are projected to grow by 1.6 percent a year for the period 2020-2040, compared to a 1.2 percent growth projected in the 2018 load forecast for the period 2018-2038. Results shown in Table 1-2.

- Winter peak demands are projected to increase 1.5 percent over the 19 year forecast (2021-2040). Summer peak demands for the same period indicate growth of 1.6 percent.

- Load factor decreases from 47.7% to 45.4% through the forecast period.

Executive Summary *(continued)*

Overall Results – Table 1-2

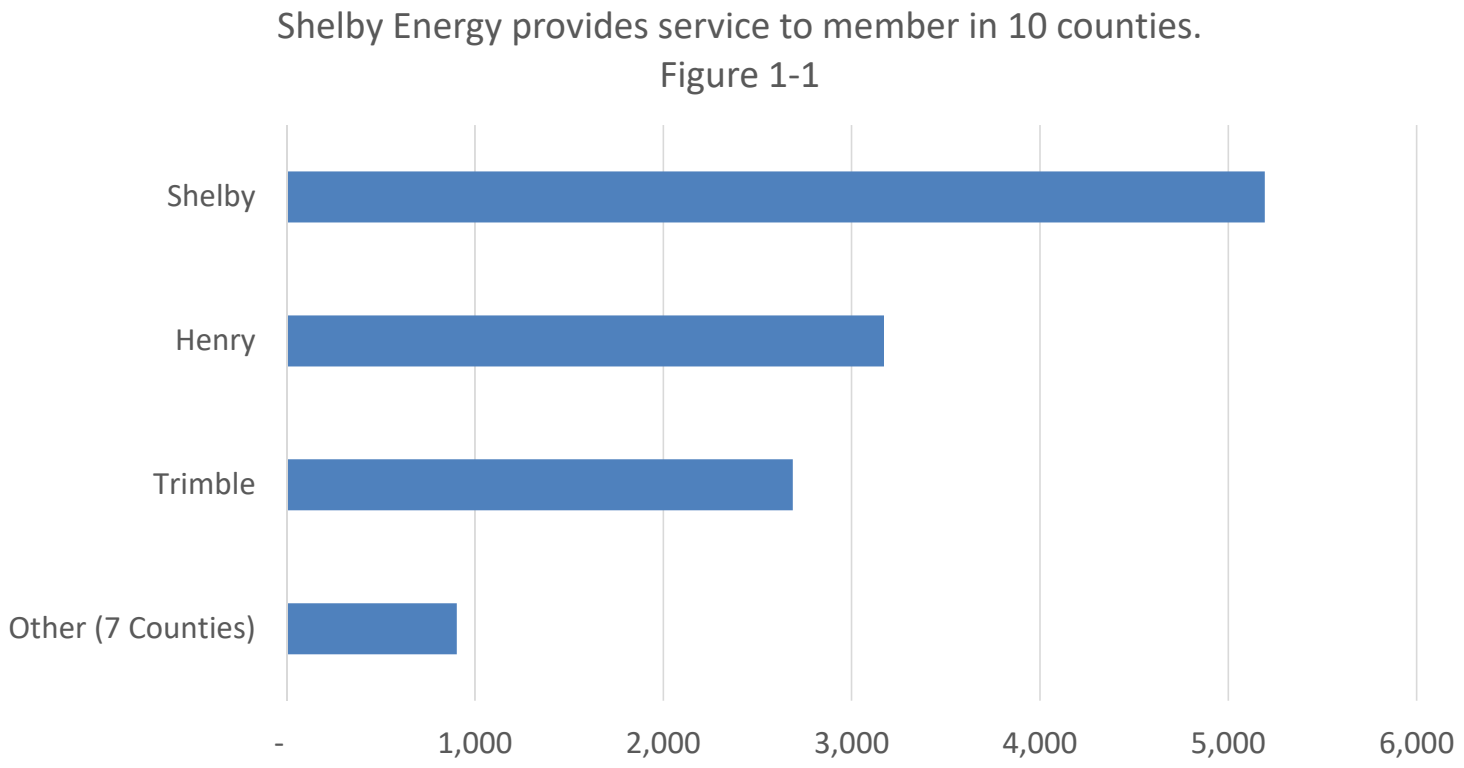
	Time Period	Residential	Seasonal Residential	Small Commercial	Large Commercial	Public Street / Highway Lighting	Total Sales
5-Year	2014-2019	0.1%	12.3%	2.0%	0.6%	-5.5%	0.6%
	2020-2025	1.4%	6.5%	4.8%	2.1%	0.0%	2.3%
10-Year	2009-2019	0.6%		3.6%	1.6%	0.2%	1.4%
	2020-2030	1.4%	5.7%	3.3%	1.2%	0.0%	1.7%
15-Year	2004-2019	1.0%		2.6%	0.3%	0.8%	1.1%
	2020-2035	1.5%	5.1%	2.9%	1.2%	0.0%	1.7%
20-Year	1999-2019	1.7%	4.5%	2.7%	0.7%	3.9%	1.5%
	2020-2040	1.5%	4.7%	2.6%	1.0%	0.0%	1.6%

Narrative

Shelby Energy Cooperative 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).

Narrative *(continued)*

Counties Served



EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Narrative *(continued)*

Three of the principal counties served by Shelby Energy are mostly rural with a high percentage of people relying on agricultural enterprises for income. Agricultural products include tobacco, equine, dairy, corn, soybeans, wheat, beef cattle and swine. Equine and beef cattle are the prime sources of agricultural income.

Shelby County has grown significantly in the commercial and industrial classification. Approximately 35 percent of the Cooperative's energy sales are from large industrial consumers in the Shelby County area.

Shelby County is centrally located and has interstate highway and rail ties to major automotive manufacturing facilities in Indiana, Ohio, Tennessee, and Kentucky. A diversity of industries have chosen the area due to its central location. Attracting small and medium-sized plants with a varied range of product lines has helped develop additional financial stability.

Future expansion of these industrial parks will occur primarily in Shelby Energy's territory as defined by certified territorial agreements established in 1972. The industrial jobs will generate a greater need for residences and consumer services provided by commercial establishments.

Narrative *(continued)*

A near “natural unemployment rate” in Shelby County continues to challenge further industrial growth. A limited number of skilled laborers are available from Shelby and surrounding counties. The local technical school and community college near Shelbyville provides additional training for the available work force. The current housing should adequately support the work force needed for existing industries to expand and new industries to continue to locate in the area. Most jobs created in the county may be attributed to the expansion of existing industry.

The other counties serve as “bedroom” communities to surrounding metropolitan areas. Commercial and industrial growth is expected to be limited in these counties. Henry County continues working with their economic development group that is experiencing some success in attracting commercial and industrial activity to its communities. Access to interstate highway and rail service are two of Henry County’s key assets. Henry County also has a semi-skilled to non-skilled workforce that has yet to be fully developed and utilized in light and heavy industry.

Shelby Energy has an average household size of 2.34 people and 74% of all homes are headed by someone age 55 or greater.

Key Assumptions

Economic History and Forecast
Table 1-3

	Time Period	Population	Households	Total Employment	Total Real Personal Income
5 Year Growth Rates	2014-2019	1.0%	1.0%	1.7%	4.8%
	2020-2025	1.1%	1.3%	2.8%	5.0%
10 Year Growth Rates	2009-2019	0.9%	0.9%	0.6%	4.1%
	2020-2030	0.9%	1.1%	1.7%	5.2%
15 Year Growth Rates	2004-2019	1.1%	1.0%	0.5%	3.8%
	2020-2035	0.8%	1.0%	1.3%	4.9%
20 Year Growth Rates	1999-2019	1.3%	1.2%	0.8%	4.5%
	2020-2040	0.7%	0.9%	1.1%	4.7%

- *EKPC's source for economic forecasts is IHS Global Insight. Total Real Personal Income is reported in millions of 2005 dollars. Growth rates shown are Compound Annual Growth Rates.*

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Key Assumptions *(continued)*
Appliance Saturations

- 60% of customers use electric as a primary fuel for heating, while 16% use it as a secondary fuel.
  - 16% use electric furnaces and 55% use electric heat pumps.
- 93% of customers use central air and 8% use electric/window units.
- 83% of customers use electric water heaters.
- These saturations are not expected to change significantly by 2040.

Key Assumptions *(continued)*

Saturation Rates – Percent of Homes with One or More Non-HVAC Appliances

- Electric Range 92%
- Freezer 60%
- Smart TV 69%

Appliance Efficiency Projections

- Energy Information Association (EIA) projects appliance efficiencies each year.
- Similar to last year's projections, heating and cooling equipment show slow but steady increase.
- Water heater efficiency is remaining relatively flat.

Key Assumptions *(continued)*

Weather

- Weather data is from the Louisville weather station.

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

Methodology and Results

Introduction

This section briefly describes the methodology used to develop the load forecast and presents results in tabular form for residential and commercial classifications. Table 1-4 shows historical data for Shelby Energy as reported on RUS Form 7.

Typically, a preliminary forecast is prepared during the first quarter depending on when Shelby Energy experiences its winter peak. The first step is modeling the regional economy. Employment and real gross county product are among the areas analyzed. The regional model results are used in combination with the historical billing information, appliance saturation data, appliance efficiency data, and weather data to develop the long range forecast.

Table 1-4 Shelby Energy 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
2010	489,186,171	9.3%	468,458,261	8.4%	20,727,910	4.2%	105.8	52.8%	15,311	2,096	7.3	$30,381,181	6.2
2011	465,401,860	-4.9%	453,101,660	-3.3%	12,300,200	2.6%	169.3	31.4%	15,315	2,097	7.3	$31,570,882	6.8
2012	467,695,359	0.5%	450,373,613	-0.6%	17,321,746	3.7%	92.7	57.6%	15,360	2,104	7.3	$32,333,801	6.9
2013	481,530,544	3.0%	465,206,589	3.3%	16,323,955	3.4%	96.8	56.8%	15,457	2,109	7.3	$33,538,636	7.0
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	57.3%	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
Average						3.5%							

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Methodology and Results *(continued)*

Introduction

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 insights from Shelby Energy staff.

Methodology and Results *(continued)*

Residential Forecast

Residential customers are analyzed by means of regression analysis with resulting coefficients used to prepare customer projections. Regressions for residential customers are typically a function of regional economic and demographic variables. Two variables that are very significant are the numbers of households by county and the percent of total households served by the member cooperative. Table 1-5 reports Shelby Energy's customer forecast.

The residential energy sales were analyzed by means of regression analysis, as a function of residential customers, base 60 heating degree days, base 65 cooling degree days and projected residential rates. Table 1-5 reports Shelby Energy's energy forecast.

Table 1-5
Residential Summary

	Customers			*Use Per Customer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	14,902	17	0.1	1,406	127	10.0	251,446	23,042	10.1
2011	14,904	2	0.0	1,388	-18	-1.3	248,173	-3,273	-1.3
2012	14,903	-1	0.0	1,235	-153	-11.0	220,786	-27,386	-11.0
2013	14,969	66	0.4	1,300	65	5.3	233,504	12,718	5.8
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	16,223	256	1.6	1,264	-4	-0.3	246,103	3,108	1.3
2021	16,499	276	1.7	1,274	10	0.8	252,228	6,124	2.5
2022	16,759	260	1.6	1,271	-3	-0.3	255,529	3,301	1.3
2023	17,014	255	1.5	1,264	-6	-0.5	258,151	2,622	1.0
2024	17,269	255	1.5	1,258	-6	-0.5	260,704	2,553	1.0
2025	17,528	259	1.5	1,255	-3	-0.3	263,895	3,191	1.2
2026	17,773	245	1.4	1,253	-2	-0.1	267,201	3,306	1.3
2027	18,022	249	1.4	1,253	0	0.0	270,915	3,714	1.4
2028	18,274	252	1.4	1,252	-1	-0.1	274,448	3,533	1.3
2029	18,530	256	1.4	1,250	-2	-0.1	277,919	3,472	1.3
2030	18,790	260	1.4	1,251	1	0.1	282,117	4,198	1.5
2031	19,053	263	1.4	1,254	3	0.2	286,684	4,567	1.6
2032	19,319	266	1.4	1,257	4	0.3	291,499	4,815	1.7
2033	19,590	271	1.4	1,257	0	0.0	295,586	4,086	1.4
2034	19,864	274	1.4	1,260	3	0.2	300,339	4,753	1.6
2035	20,142	278	1.4	1,264	4	0.3	305,517	5,178	1.7
2036	20,424	282	1.4	1,272	8	0.7	311,824	6,307	2.1
2037	20,710	286	1.4	1,274	2	0.2	316,707	4,883	1.6
2038	21,000	290	1.4	1,280	6	0.4	322,568	5,861	1.9
2039	21,294	294	1.4	1,285	5	0.4	328,340	5,771	1.8
2040	21,592	298	1.4	1,292	7	0.5	334,738	6,399	1.9

Note: 2012 reflects reclass from Residential to Residential Seasonal.

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Methodology and Results *(continued)*

Seasonal Residential Forecast

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

Table 1-6
Seasonal Residential Summary

	Customers			Use Per Customer			Class Sales		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	0								
2011	0								
2012	67	67		282	282		227	227	
2013	94	27	40.3	266	-16	-5.6	300	73	32.4
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	160	10	6.7	351	-18	-4.8	673	10	1.6
2021	170	10	6.3	365	14	4.1	744	71	10.6
2022	180	10	5.9	364	-1	-0.2	787	43	5.7
2023	191	11	6.1	362	-2	-0.6	830	43	5.5
2024	203	12	6.3	359	-3	-0.8	875	45	5.5
2025	214	11	5.4	359	-1	-0.2	921	46	5.2
2026	225	11	5.1	359	1	0.2	970	49	5.3
2027	238	13	5.8	358	-1	-0.3	1,024	53	5.5
2028	251	13	5.5	358	0	-0.1	1,079	55	5.4
2029	262	11	4.4	358	0	0.0	1,126	47	4.4
2030	273	11	4.2	358	0	-0.1	1,172	46	4.1
2031	284	11	4.0	358	1	0.2	1,222	50	4.2
2032	295	11	3.9	360	1	0.4	1,274	52	4.3
2033	307	12	4.1	360	0	-0.1	1,325	51	4.0
2034	317	10	3.3	361	2	0.4	1,374	49	3.7
2035	329	12	3.8	361	0	0.0	1,427	53	3.8
2036	340	11	3.3	364	3	0.8	1,487	60	4.2
2037	350	10	2.9	365	1	0.2	1,534	47	3.2
2038	361	11	3.1	366	1	0.3	1,587	53	3.5
2039	372	11	3.0	368	1	0.3	1,641	54	3.4
2040	383	11	3.0	370	2	0.6	1,699	58	3.6

Methodology and Results *(continued)*

Small Commercial Forecast

Small commercial sales are projected using two equations: a customer equation and a small commercial sales equation. Both are determined through regression analysis and utilize inputs relating to the economy, electric price, and the residential customer forecast. Small commercial projections are reported in Table 1-7.

Table 1-7
Small Commercial Summary

	Customers			*Use Per Customer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	371	3	0.8	166	-5	-2.8	61,710	-1,257	-2.0
2011	372	1	0.3	147	-19	-11.4	54,853	-6,858	-11.1
2012	350	-22	-5.9	191	43	29.4	66,785	11,932	21.8
2013	355	5	1.4	189	-2	-1.2	66,932	147	0.2
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	560	11	2.0	148	-15	-9.1	82,936	-6,465	-7.2
2021	570	10	1.8	170	22	14.9	96,965	14,030	16.9
2022	580	10	1.8	171	0	0.2	98,905	1,939	2.0
2023	590	10	1.7	171	0	0.3	100,883	1,978	2.0
2024	601	11	1.9	171	0	0.0	102,800	1,917	1.9
2025	612	11	1.8	171	0	0.1	104,753	1,953	1.9
2026	623	11	1.8	171	0	0.1	106,743	1,990	1.9
2027	634	11	1.8	172	0	0.1	108,771	2,028	1.9
2028	645	11	1.7	172	0	0.2	110,838	2,067	1.9
2029	657	12	1.9	172	0	0.0	112,944	2,106	1.9
2030	669	12	1.8	172	0	0.1	115,090	2,146	1.9
2031	681	12	1.8	172	0	0.1	117,276	2,187	1.9
2032	693	12	1.8	172	0	0.1	119,505	2,228	1.9
2033	706	13	1.9	172	0	0.0	121,775	2,271	1.9
2034	718	12	1.7	173	0	0.2	124,089	2,314	1.9
2035	731	13	1.8	173	0	0.1	126,447	2,358	1.9
2036	744	13	1.8	173	0	0.1	128,849	2,402	1.9
2037	758	14	1.9	173	0	0.0	131,297	2,448	1.9
2038	771	13	1.7	174	0	0.2	133,792	2,495	1.9
2039	785	14	1.8	174	0	0.1	136,334	2,542	1.9
2040	799	14	1.8	174	0	0.1	138,924	2,590	1.9

Methodology and Results *(continued)*

Large Commercial Forecast

Large commercial customers are those with loads 1 MW or greater. Shelby Energy currently has 10 customers in this class and is projected to increase to 12 customers by 2040. Large commercial results are reported in Table 1-8.

Table 1-8
Large Commercial Summary

	Customers			*Use Per Customer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Annual Average (MWh)	Change (MWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	8	0	0.0	19,390	1,794	10.2	155,118	14,355	10.2
2011	8	0	0.0	18,725	-665	-3.4	149,799	-5,318	-3.4
2012	8	0	0.0	20,290	1,566	8.4	162,324	12,524	8.4
2013	8	0	0.0	20,539	248	1.2	164,308	1,985	1.2
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	13,671	-2,800	-17.0	150,378	-14,325	-8.7
2021	10	-1	-9.1	14,585	915	6.7	145,855	-4,523	-3.0
2022	10	0	0.0	14,961	375	2.6	149,606	3,752	2.6
2023	11	1	10.0	14,797	-163	-1.1	162,772	13,166	8.8
2024	11	0	0.0	15,050	253	1.7	165,555	2,783	1.7
2025	11	0	0.0	15,200	149	1.0	167,198	1,643	1.0
2026	11	0	0.0	15,282	82	0.5	168,104	906	0.5
2027	11	0	0.0	15,333	51	0.3	168,659	556	0.3
2028	11	0	0.0	15,357	24	0.2	168,923	264	0.2
2029	11	0	0.0	15,391	35	0.2	169,305	383	0.2
2030	11	0	0.0	15,433	42	0.3	169,763	457	0.3
2031	11	0	0.0	15,462	29	0.2	170,085	322	0.2
2032	12	1	9.1	14,957	-505	-3.3	179,489	9,404	5.5
2033	12	0	0.0	14,993	36	0.2	179,921	432	0.2
2034	12	0	0.0	15,039	46	0.3	180,468	548	0.3
2035	12	0	0.0	15,079	40	0.3	180,946	478	0.3
2036	12	0	0.0	15,126	47	0.3	181,507	561	0.3
2037	12	0	0.0	15,167	42	0.3	182,007	500	0.3
2038	12	0	0.0	15,217	50	0.3	182,606	599	0.3
2039	12	0	0.0	15,270	53	0.3	183,240	634	0.3
2040	12	0	0.0	15,325	55	0.4	183,906	665	0.4

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

	Customers			*Use Per Customer*			*Class Sales*		
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
2010	30	0	0.0	513	118	29.7	185	42	29.7
2011	31	1	3.3	744	231	44.9	277	92	49.8
2012	32	1	3.2	656	-88	-11.8	252	-25	-8.9
2013	31	-1	-3.1	435	-221	-33.7	162	-90	-35.7
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	365	-1	-0.2	145	0	-0.2
2021	33	0	0.0	365	0	0.0	145	0	0.0
2022	33	0	0.0	365	0	0.0	145	0	0.0
2023	33	0	0.0	365	0	0.0	145	0	0.0
2024	33	0	0.0	365	0	0.0	145	0	0.0
2025	33	0	0.0	365	0	0.0	145	0	0.0
2026	33	0	0.0	365	0	0.0	145	0	0.0
2027	33	0	0.0	365	0	0.0	145	0	0.0
2028	33	0	0.0	365	0	0.0	145	0	0.0
2029	33	0	0.0	365	0	0.0	145	0	0.0
2030	33	0	0.0	365	0	0.0	145	0	0.0
2031	33	0	0.0	365	0	0.0	145	0	0.0
2032	33	0	0.0	365	0	0.0	145	0	0.0
2033	33	0	0.0	365	0	0.0	145	0	0.0
2034	33	0	0.0	365	0	0.0	145	0	0.0
2035	33	0	0.0	365	0	0.0	145	0	0.0
2036	33	0	0.0	365	0	0.0	145	0	0.0
2037	33	0	0.0	365	0	0.0	145	0	0.0
2038	33	0	0.0	365	0	0.0	145	0	0.0
2039	33	0	0.0	365	0	0.0	145	0	0.0
2040	33	0	0.0	365	0	0.0	145	0	0.0

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative

Methodology and Results *(continued)*

Peak Day Weather Scenarios

Extreme temperatures can dramatically influence Shelby Energy's peak demands. Table 1-10 reports the impact of extreme weather on system demands.

Table 1-10: Seasonal Peaks by Weather Scenario – Including Direct Serves

Winter Peak Day Minimum Temperatures				
	Normal	Extreme		
Degrees	2	-5	-9	-14
Occurs Once in ..	2 Years	5 Years	10 Years	30 Years
Non-Coincident Winter Peak Demand - MW				
Season	Normal	Extreme		
2020 - 21	124	129	132	136
2021 - 22	126	131	134	138
2022 - 23	129	134	137	141
2023 - 24	131	136	139	143
2024 - 25	132	138	141	146
2025 - 26	134	140	143	148
2026 - 27	136	142	145	150
2027 - 28	138	144	147	152
2028 - 29	140	146	150	154
2029 - 30	142	148	152	156
2030 - 31	144	150	154	158
2031 - 32	147	153	157	161
2032 - 33	149	155	159	164
2033 - 34	151	158	161	166
2034 - 35	153	160	163	168
2035 - 36	155	162	166	171
2036 - 37	157	164	168	173
2037 - 38	160	166	170	175
2038 - 39	162	169	173	178
2039 - 40	164	171	175	180

Summer Peak Day Maximum Temperatures				
	Normal	Extreme		
Degrees	98	101	103	105
Occurs Once in ...	2 Years	5 Years	10 Years	30 Years
Non-Coincident Summer Peak Demand - MW				
Year	Normal	Extreme		
2021	99	102	105	108
2022	100	104	107	109
2023	103	107	110	112
2024	105	109	111	114
2025	106	110	113	116
2026	108	112	115	117
2027	109	113	116	119
2028	111	115	118	121
2029	112	117	119	122
2030	114	118	121	124
2031	115	120	123	126
2032	118	123	126	129
2033	120	125	128	131
2034	122	126	130	133
2035	123	128	131	134
2036	125	130	133	136
2037	127	132	135	138
2038	129	133	137	140
2039	130	135	139	142
2040	132	137	141	144