Grayson Rural Electric Cooperative Corporation
2014 Load Forecast

Prepared by

East Kentucky Power Cooperative

Load Forecasting Department

Touchstone Energy®
Cooperatives
The power of human connections

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Table of Contents

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 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 Grayson RECC for reasonability. Final projects 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 reported beginning on page 14.

Executive Summary *(continued)*

The load forecast is prepared tri-annually 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 three-year work plans, long-range work plans, and financial forecasts. EKPC uses the forecast in areas of marketing analysis, transmission planning, generation planning, demand-side planning, and financial forecasting.

The complete load forecast for Grayson RECC 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 1994 through 2034.

Table 1-1
Grayson RECC
2014 Load Forecast
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)
1994	123,646	0	31,785	0	14,664	70	170,165	0	7.3	183,581
1995	134,204	0	34,049	0	16,246	71	184,569	0	6.8	198,013
1996	141,136	0	35,127	0	16,819	71	193,154	0	6.3	206,250
1997	141,902	0	35,184	0	18,134	73	195,293	0	6.8	209,648
1998	144,608	0	36,269	0	18,502	73	199,452	0	6.2	212,663
1999	151,055	0	38,784	0	18,389	76	208,304	0	6.7	223,158
2000	160,185	0	41,675	0	18,067	77	220,004	0	5.9	233,898
2001	164,833	0	44,052	0	18,454	77	227,415	0	3.8	236,421
2002	176,446	0	48,462	0	18,404	77	243,390	0	3.8	253,113
2003	174,698	0	47,980	0	19,156	79	241,912	0	4.1	252,309
2004	176,120	0	51,626	0	18,388	80	246,214	0	6.6	263,552
2005	187,260	0	56,561	0	17,532	80	261,433	0	5.9	277,815
2006	178,207	0	56,158	0	15,636	83	250,083	0	5.8	265,607
2007	192,737	0	59,181	0	16,264	84	268,267	0	4.9	282,214
2008	194,355	0	59,492	0	16,288	81	270,216	0	5.4	285,707
2009	184,913	0	56,889	0	18,883	33	260,718	0	5.3	275,446
2010	192,055	0	58,685	0	18,569	54	269,363	0	6.3	287,466
2011	177,675	0	53,818	0	19,513	50	251,055	0	6.7	269,142
2012	173,010	0	42,679	0	28,995	51	244,734	0	5.9	260,204
2013	182,764	0	45,314	0	29,469	51	257,598	0	4.4	269,549
2014	181,980	0	42,237	0	29,743	51	254,010	0	6.0	270,224
2015	183,113	0	43,638	0	30,020	51	256,822	0	6.0	273,215
2016	183,626	0	44,013	0	30,301	51	257,991	0	6.0	274,458
2017	184,075	0	44,627	0	30,584	51	259,337	0	6.0	275,890
2018	184,579	0	45,289	0	30,872	51	260,791	0	6.0	277,437
2019	185,119	0	45,710	0	31,162	51	262,042	0	6.0	278,769
2020	185,719	0	45,871	0	31,456	51	263,097	0	6.0	279,890
2021	186,447	0	46,242	0	31,753	51	264,494	0	6.0	281,376
2022	187,341	0	46,739	0	32,054	51	266,186	0	6.0	283,176
2023	188,310	0	47,303	0	32,359	51	268,023	0	6.0	285,131
2024	189,066	0	47,881	0	32,667	51	269,666	0	6.0	286,878
2025	189,823	0	48,576	0	32,979	52	271,429	0	6.0	288,754
2026	190,490	0	49,364	0	33,294	52	273,199	0	6.0	290,638
2027	191,178	0	49,887	0	33,613	52	274,729	0	6.0	292,265
2028	191,984	0	50,598	0	33,936	52	276,570	0	6.0	294,223
2029	192,775	0	51,316	0	34,263	52	278,406	0	6.0	296,176
2030	193,336	0	51,913	0	34,594	52	279,895	0	6.0	297,761
2031	193,913	0	52,538	0	34,929	52	281,432	0	6.0	299,396
2032	194,249	0	53,052	0	35,268	52	282,621	0	6.0	300,661
2033	194,637	0	53,557	0	35,611	52	283,858	0	6.0	301,976
2034	195,027	0	53,976	0	35,958	52	285,013	0	6.0	303,205

Table 1-1 Continued
Grayson RECC - 2014 Load Forecast
Peaks Summary

	Winter		Summer			
	Noncoincident Peak Demand		Noncoincident Peak Demand		Purchased Power	Load Factor
Season	(MW)	Year	(MW)	Year	(MWh)	(%)
1993 - 94	50.1	1994	36.4	1994	183,581	41.8%
1994 - 95	45.9	1995	42.0	1995	198,013	49.3%
1995 - 96	53.1	1996	40.5	1996	206,250	44.2%
1996 - 97	51.0	1997	43.0	1997	209,648	46.9%
1997 - 98	47.1	1998	44.1	1998	212,663	51.5%
1998 - 99	55.0	1999	50.7	1999	223,158	46.3%
1999 - 00	59.5	2000	46.2	2000	233,898	44.8%
2000 - 01	65.2	2001	51.2	2001	236,421	41.4%
2001 - 02	58.6	2002	52.0	2002	253,113	49.3%
2002 - 03	64.5	2003	50.1	2003	252,309	44.7%
2003 - 04	68.7	2004	50.0	2004	263,552	43.7%
2004 - 05	70.4	2005	57.9	2005	277,815	45.0%
2005 - 06	67.2	2006	56.8	2006	265,607	45.1%
2006 - 07	79.1	2007	58.3	2007	282,214	40.7%
2007 - 08	76.8	2008	54.5	2008	285,707	42.4%
2008 - 09	80.3	2009	52.6	2009	275,446	39.2%
2009 - 10	69.6	2010	58.3	2010	287,466	47.1%
2010 - 11	70.2	2011	56.5	2011	269,142	43.8%
2011 - 12	59.7	2012	57.1	2012	260,204	49.6%
2012 - 13	63.3	2013	52.6	2013	269,549	48.6%
2013 - 14	81.7	2014	53.5	2014	270,224	37.7%
2014 - 15	80.3	2015	54.0	2015	273,215	38.8%
2015- 16	80.5	2016	54.2	2016	274,458	38.8%
2016 - 17	80.8	2017	54.5	2017	275,890	39.0%
2017 - 18	81.0	2018	54.8	2018	277,437	39.1%
2018 - 19	81.2	2019	55.1	2019	278,769	39.2%
2019 - 20	81.3	2020	55.3	2020	279,890	39.2%
2020 - 21	81.5	2021	55.6	2021	281,376	39.4%
2021 - 22	81.6	2022	55.9	2022	283,176	39.6%
2022 - 23	81.8	2023	56.3	2023	285,131	39.8%
2023 - 24	81.9	2024	56.7	2024	286,878	39.9%
2024 - 25	82.0	2025	57.0	2025	288,754	40.2%
2025 - 26	82.1	2026	57.4	2026	290,638	40.4%
2026 - 27	82.4	2027	57.7	2027	292,265	40.5%
2027 - 28	82.5	2028	58.1	2028	294,223	40.6%
2028 - 29	82.7	2029	58.5	2029	296,176	40.9%
2029 - 30	82.9	2030	58.8	2030	297,761	41.0%
2030 - 31	83.1	2031	59.1	2031	299,396	41.2%
2031 - 32	83.1	2032	59.4	2032	300,661	41.3%
2032 - 33	83.2	2033	59.6	2033	301,976	41.5%
2033 - 34	83.2	2034	59.9	2034	303,205	41.6%

Executive Summary *(continued)*
Overall Results

- Total sales are projected to grow by 0.6 percent a year for the period 2014-2034, compared to a 1.4 percent growth projected in the 2012 load forecast for the period 2012-2032. Results shown in Table 1-2 and Figure 1-1.

- Winter peak demands for 2014-2034 indicate an annual growth of 0.2 percent and 0.6 percent, respectively. Annual peaks shown in Figure 1-2.

- Load factor increases from 37.7% to 41.6% for the forecast period. See Figure 1-3.

Executive Summary *(continued)*
Overall Results - Table 1-2 Energy Sales Growth

| Average Growth Rates	Time Period	Residential	Commercial and Industrial ≤ 1000 KVA	Commercial and Industrial > 1000 KVA	Public Street and Highway Lighting	Total
5-Year	2008-2013	-1.2%	-5.3%	12.6%	-8.8%	-1.0%
	2014-2019	0.3%	1.6%	0.9%	0.1%	0.6%
10-Year	2003-2013	0.5%	-0.6%	4.4%	-4.3%	0.6%
	2014-2024	0.4%	1.3%	0.9%	0.1%	0.6%
15-Year	1998-2013	1.6%	1.5%	3.2%	-2.4%	1.7%
	2014-2029	0.4%	1.3%	0.9%	0.1%	0.6%
20-Year	1993-2013	2.1%	1.7%	3.1%	-1.4%	2.1%
	2014-2034	0.3%	1.2%	1.0%	0.1%	0.6%

Figure 1-1
Average Annual Growth in Sales
2014-2034

20 Year Growth Rates - 2014-2034
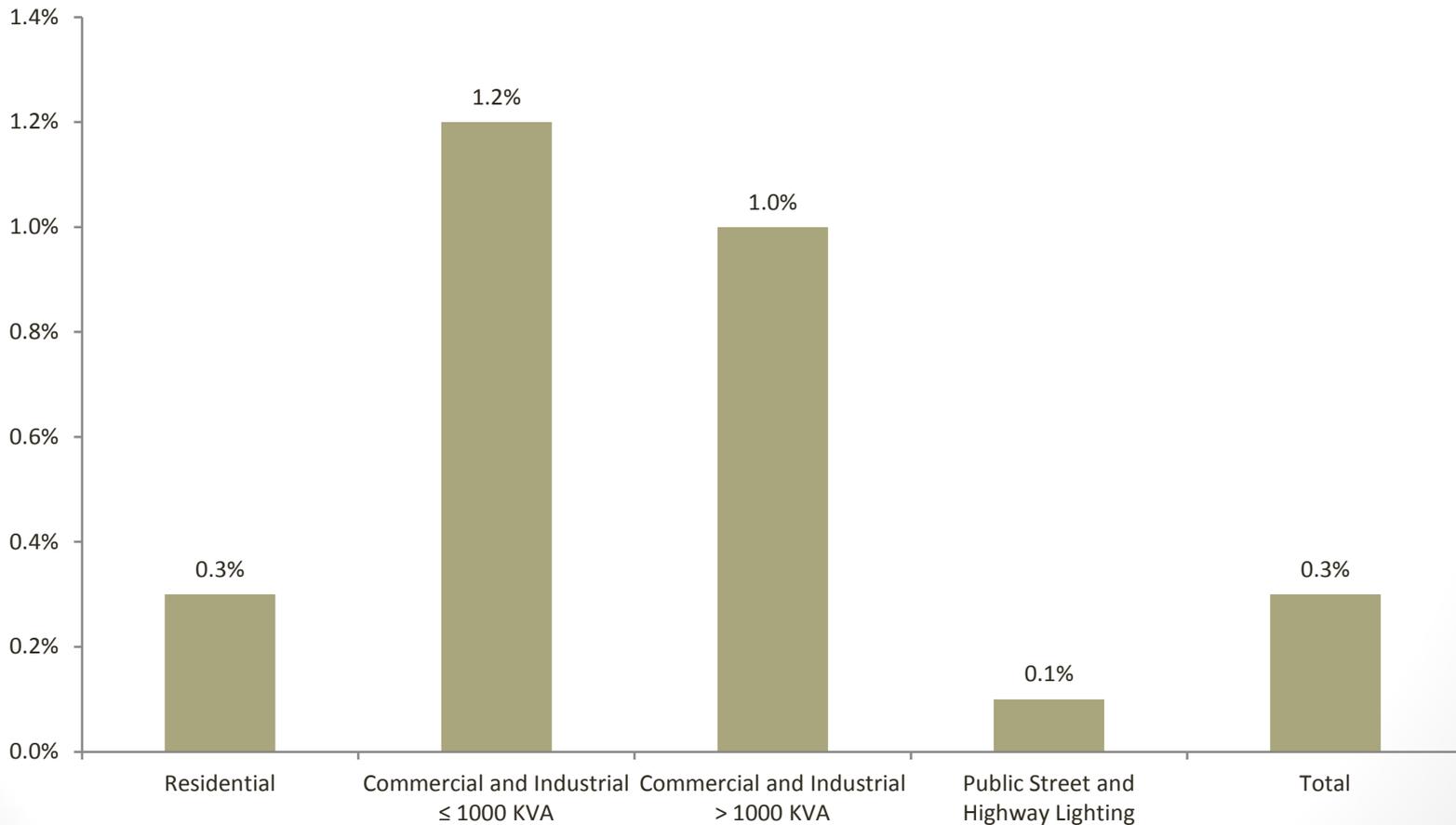
Figure 1-2
Peak Demand Forecast
Winter and Summer

Grayson RECC - Normal Peaks
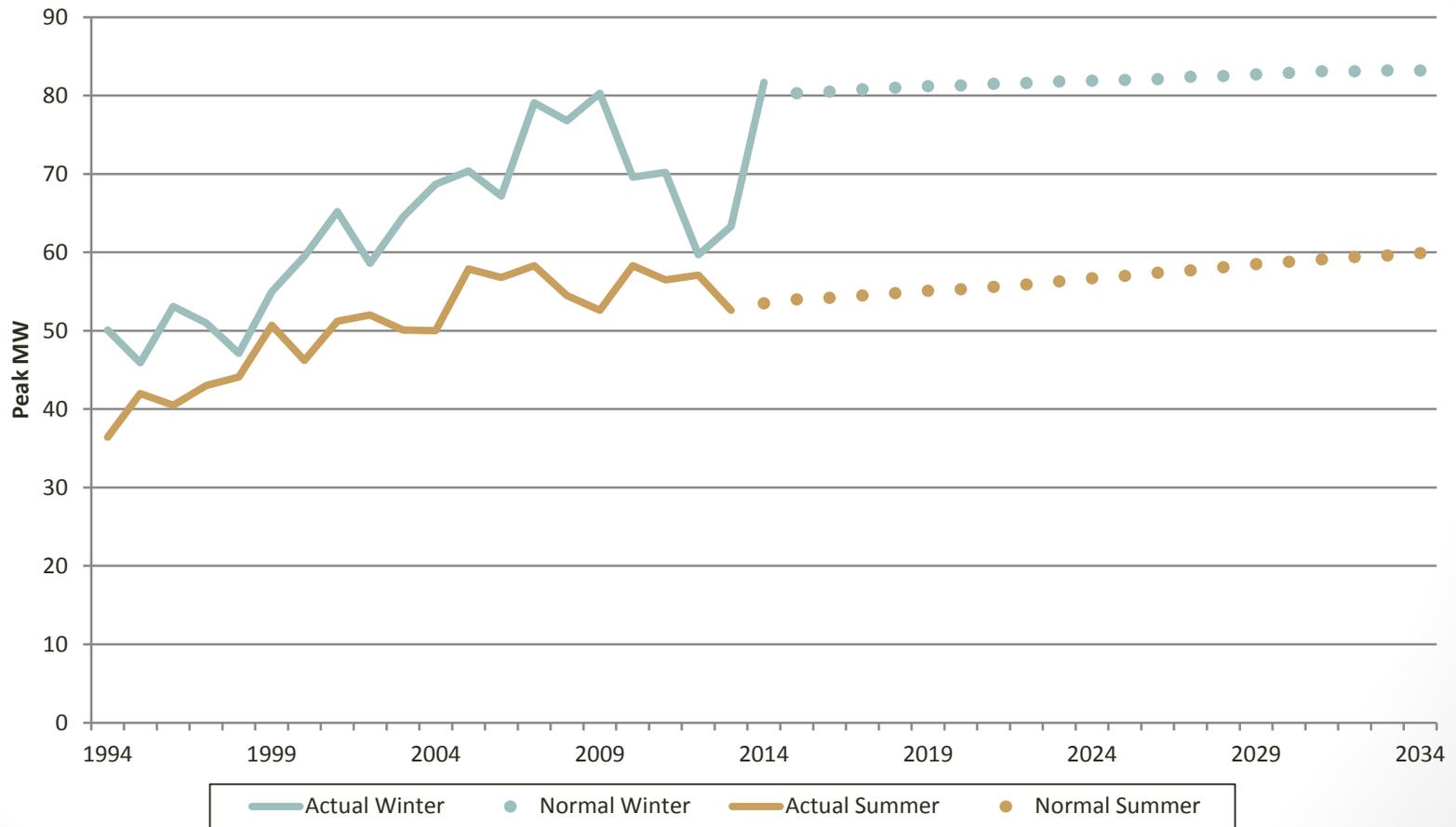
Figure 1-3
Annual System Load Factor
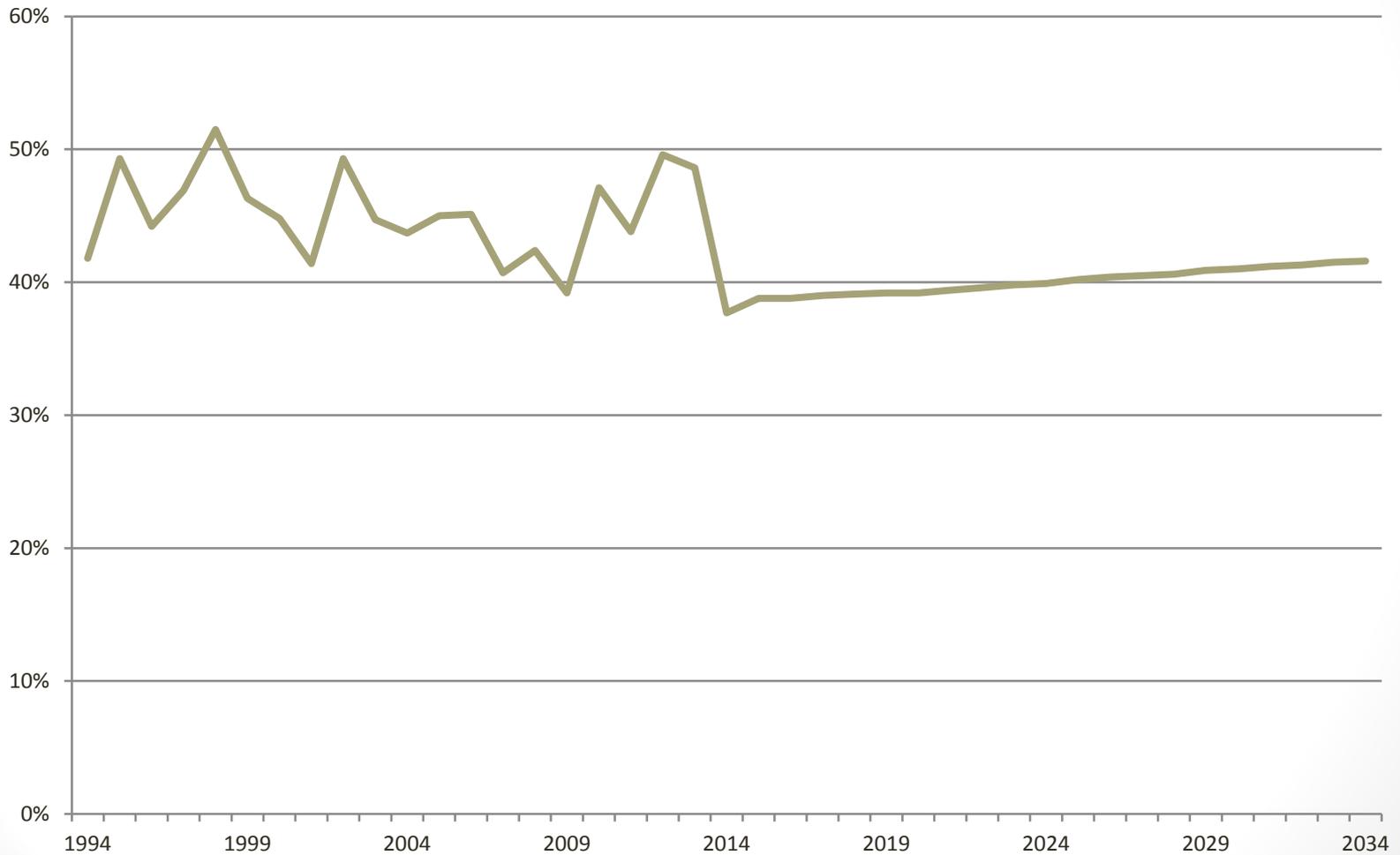
Narrative
Territory

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 2.29 people; approximately 67 percent of all homes are headed by someone age 55 or greater.

Narrative
Counties Served

Gryason RECC provides service to members in 6 counties.
Figure 1-4
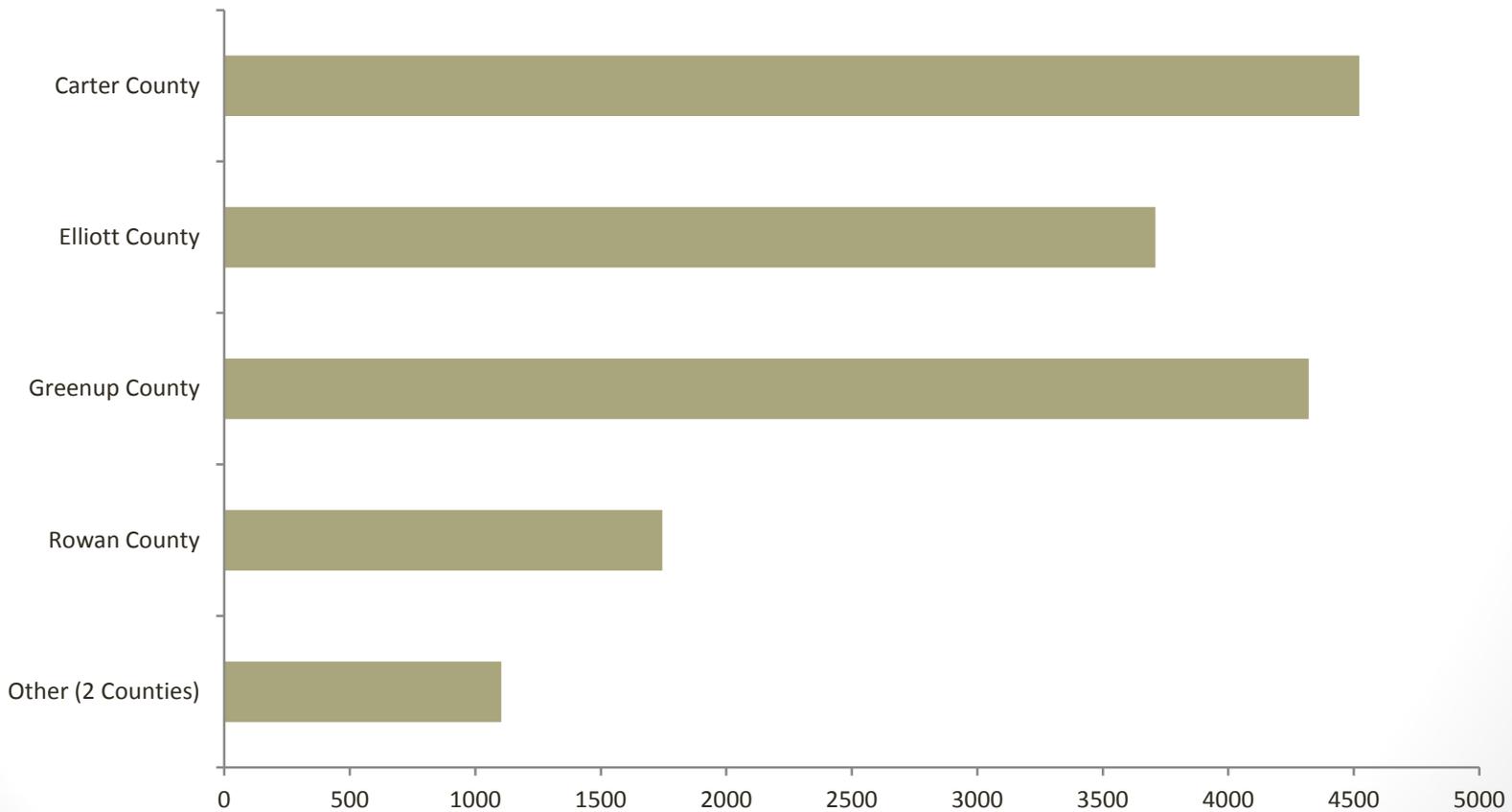
Key Assumptions
Power Cost and Rates

- EKPC's wholesale power cost forecast used in this load forecast comes from the following report; "Ten-Year Financial Forecast, 2013-2022". Approved October 2013.

- Average residential rates will change from 6.964 cents/kWh in 2014 to 10.418 cents/kWh in 2034.

14

Key Assumptions *(continued)*
North Eastern Economic Region History and Forecast

	Population		Households		Total Employment		Total Real Personal Income	
		% Change		% Change		% Change		% Change
1994	257,249		97,110		81,278		$4,824	
1995	258,471	0.5%	98,671	1.6%	83,059	2.2%	$4,848	0.5%
1996	259,625	0.4%	100,259	1.6%	84,539	1.8%	$5,018	3.5%
1997	261,249	0.6%	101,323	1.1%	86,289	2.1%	$5,257	4.8%
1998	262,767	0.6%	102,285	0.9%	88,829	2.9%	$5,481	4.3%
1999	264,160	0.5%	103,244	0.9%	89,319	0.6%	$5,531	0.9%
2000	265,097	0.4%	103,793	0.5%	90,638	1.5%	$5,849	5.8%
2001	265,970	0.3%	104,336	0.5%	90,772	0.1%	$5,970	2.1%
2002	266,503	0.2%	104,759	0.4%	91,894	1.2%	$6,118	2.5%
2003	267,256	0.3%	105,132	0.4%	93,630	1.9%	$6,185	1.1%
2004	267,698	0.2%	105,254	0.1%	93,516	-0.1%	$6,302	1.9%
2005	268,985	0.5%	105,627	0.4%	94,026	0.5%	$6,360	0.9%
2006	270,707	0.6%	105,385	-0.2%	94,632	0.6%	$6,552	3.0%
2007	271,541	0.3%	105,419	0.0%	95,334	0.7%	$6,713	2.4%
2008	272,688	0.4%	106,571	1.1%	94,140	-1.3%	$6,906	2.9%
2009	273,249	0.2%	106,763	0.2%	89,298	-5.1%	$6,922	0.2%
2010	273,774	0.2%	107,292	0.5%	89,515	0.2%	$7,004	1.2%
2011	273,637	-0.1%	106,872	-0.4%	89,000	-0.6%	$7,065	0.9%
2012	272,773	-0.3%	107,972	1.0%	89,249	0.3%	$7,152	1.2%
2013	272,467	-0.1%	108,637	0.6%	88,713	-0.6%	$7,190	0.5%
2014	272,624	0.1%	109,060	0.4%	88,763	0.1%	$7,280	1.2%
2015	273,251	0.2%	109,392	0.3%	90,478	1.9%	$7,508	3.1%
2016	273,920	0.2%	109,953	0.5%	92,201	1.9%	$7,788	3.7%
2017	274,804	0.3%	110,773	0.7%	93,757	1.7%	$8,038	3.2%
2018	275,816	0.4%	111,665	0.8%	95,001	1.3%	$8,280	3.0%
2024	281,050	0.3%	115,147	0.5%	98,085	0.4%	$9,511	2.3%
2034	287,324	0.2%	120,277	0.4%	102,765	0.5%	$11,602	2.0%

EKPC's source for economic forecasts is IHS Global Insight. Total Real Personal Income is reported in millions of 2005 dollars. Growth rates are average annual changes.

Key Assumptions *(continued)*
Appliance Saturations

- 51.6% of customers use electric as a primary fuel for heating, while 20.1% use it as a secondary fuel.
  - 20.8% use electric furnaces and 37.5% use electric heat pumps.
- 76.3% of customers use central air and 34.6% use electric/window units.
- 92.8% of customers use electric water heaters.
- These saturations are not expected to change significantly by 2034.

16

Key Assumptions *(continued)*

Saturation Rates
Non HVAC Appliances

- Electric Range   87%
- Dishwasher   49%
- Freezer   63%
- Clothes Dryer   90%
- Personal Computer   63%

Key Assumptions *(continued)*
Electric Appliance Efficiency – East South Central Region
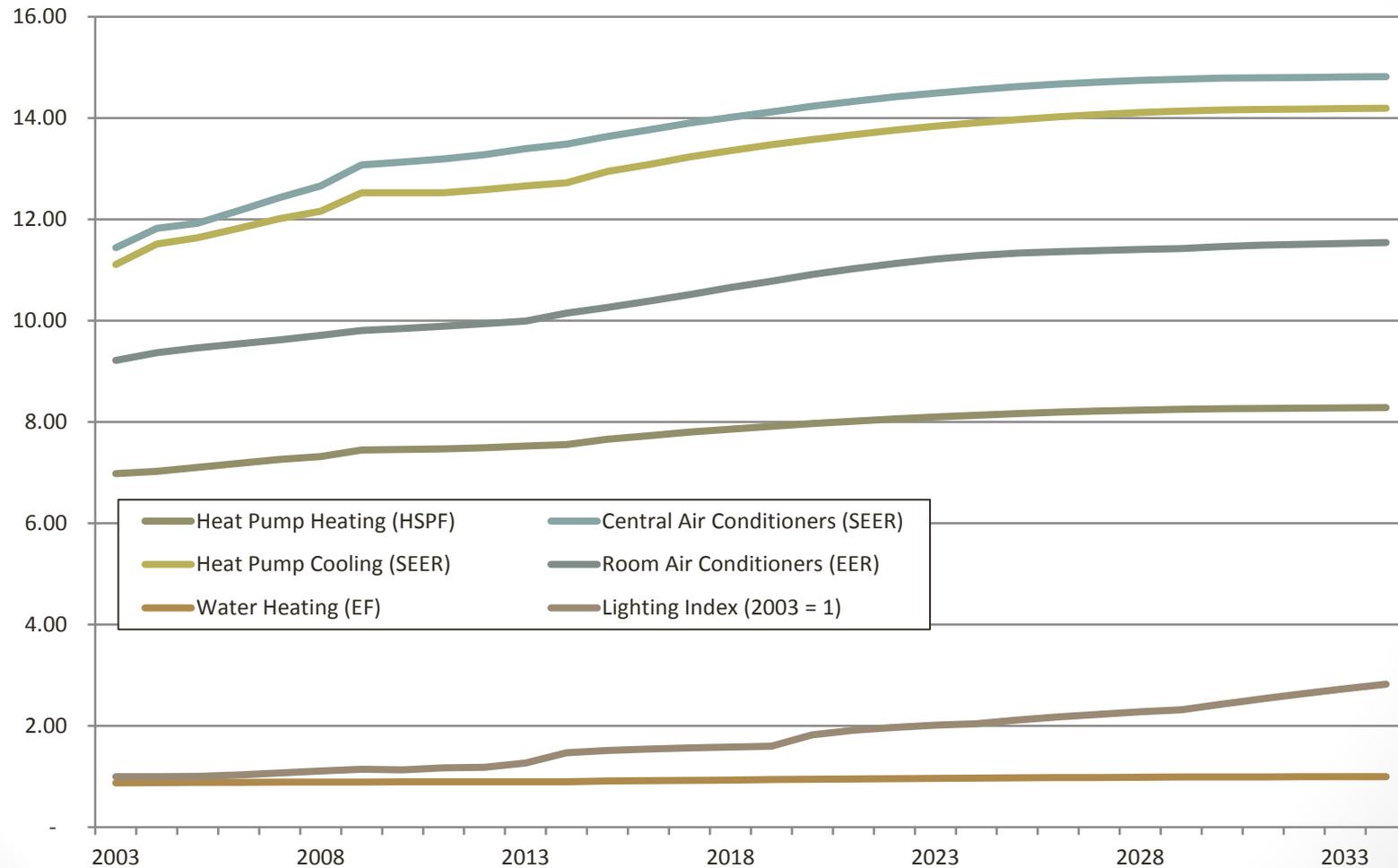
Key Assumptions *(continued)*
Weather

- Weather data is from the Huntington weather station.

- Normal weather, a 30-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 and graphical form for residential and commercial classifications. Table 1-3 through table 1-5 shows historical data for Grayson RECC as reported on RUS Form 736 and RUS Form 5.

A preliminary forecast is prepared during the first quarter depending on when Grayson RECC experiences its winter peak. The first step is modeling the regional economy. Households, employment, population density, real total personal income, 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 1-3 - Grayson RECC Comparative Annual Operating Data

Year	kWh Purchased And Generated	Change	kWh Sold	Change	kWh Loss	% Loss	Billing Peak Demand (MW)	Average Number Of Consumers	Miles Of Line	Consumers Per Mile	Cost Of Purchased Power	Cents / kWh
1999	223,157,678		208,303,880		14,853,798	6.7%	54.1	14,115	2,286	6.2	$7,943,822	3.6
2000	233,898,374	4.8%	220,004,177	5.6%	13,894,197	5.9%	57.1	14,126	2,309	6.1	$8,535,706	3.6
2001	236,421,430	1.1%	227,415,106	3.4%	9,006,324	3.8%	59.3	14,360	2,334	6.2	$9,255,349	3.9
2002	253,113,145	7.1%	243,389,736	7.0%	9,723,409	3.8%	57.5	14,673	2,357	6.2	$9,731,363	3.8
2003	252,309,335	-0.3%	241,913,737	-0.6%	10,395,598	4.1%	61.9	14,827	2,377	6.2	$10,147,008	4.0
2004	263,552,482	4.5%	246,214,313	1.8%	17,338,169	6.6%	67.7	15,113	2,400	6.3	$11,697,993	4.4
2005	277,814,556	5.4%	261,432,545	6.2%	16,382,011	5.9%	64.3	15,302	2,416	6.3	$14,441,797	5.2
2006	265,607,453	-4.4%	250,083,354	-4.3%	15,524,099	5.8%	64.9	15,517	2,437	6.4	$14,834,604	5.6
2007	282,214,145	6.3%	268,266,972	7.3%	13,947,173	4.9%	61.2	15,631	2,453	6.4	$16,786,116	5.9
2008	285,706,749	1.2%	270,216,453	0.7%	15,490,296	5.4%	70.7	15,722	2,466	6.4	$18,338,038	6.4
2009	275,446,485	-3.6%	260,717,915	-3.5%	14,728,570	5.3%	61.9	15,678	2,474	6.3	$17,711,230	6.4
2010	287,466,017	4.4%	269,363,286	3.3%	18,102,731	6.3%	69.3	15,533	2,483	6.3	$18,758,497	6.5
2011	269,141,703	-6.4%	251,055,413	-6.8%	18,086,290	6.7%	54.2	15,470	2,486	6.2	$19,235,241	7.1
2012	260,203,922	-3.3%	244,734,260	-2.5%	15,469,662	5.9%	52.1	15,389	2,485	6.2	$18,938,586	7.3
2013	269,548,753	3.6%	257,598,620	5.3%	11,950,133	4.4%	56.5	15,391	2,480	6.2	$19,639,851	7.3
Average						5.5%						

Table 1-4 - Grayson RECC Comparative Annual Operating Data

Year	Residential kWh Sales	Residential % Change	Residential Seasonal kWh Sales	Residential Seasonal % Change	Commercial / Industrial (1 MW Or Less) kWh Sales	Commercial / Industrial (1 MW Or Less) % Change	Commercial / Industrial (Over 1 MW) kWh Sales	Commercial / Industrial (Over 1 MW) % Change	Public Street / Highway Lighting kWh Sales	Public Street / Highway Lighting % Change	Public Authorities kWh Sales	Public Authorities % Change
1999	151,055,191		0		38,783,839		18,388,800		76,050		0	
2000	160,185,496	6.0%	0		41,674,981	7.5%	18,067,200	-1.7%	76,500	0.6%	0	
2001	164,833,331	2.9%	0		44,051,675	5.7%	18,453,600	2.1%	76,500	0.0%	0	
2002	176,445,772	7.0%	0		48,462,370	10.0%	18,404,344	-0.3%	77,250	1.0%	0	
2003	174,698,419	-1.0%	0		47,979,579	-1.0%	19,156,464	4.1%	79,275	2.6%	0	
2004	176,119,896	0.8%	0		51,625,853	7.6%	18,388,464	-4.0%	80,100	1.0%	0	
2005	187,259,717	6.3%	0		56,560,764	9.6%	17,531,664	-4.7%	80,400	0.4%	0	
2006	178,206,517	-4.8%	0		56,158,367	-0.7%	15,635,670	-10.8%	82,800	3.0%	0	
2007	192,737,369	8.2%	0		59,181,479	5.4%	16,264,464	4.0%	83,660	1.0%	0	
2008	194,354,762	0.8%	0		59,492,338	0.5%	16,288,464	0.1%	80,889	-3.3%	0	
2009	184,913,284	-4.9%	0		56,888,795	-4.4%	18,883,172	15.9%	32,664	-59.6%	0	
2010	192,055,267	3.9%	0		58,684,691	3.2%	18,569,364	-1.7%	53,964	65.2%	0	
2011	177,674,842	-7.5%	0		53,817,718	-8.3%	19,512,564	5.1%	50,289	-6.8%	0	
2012	173,010,180	-2.6%	0		42,678,514	-20.7%	28,994,964	48.6%	50,602	0.6%	0	
2013	182,764,394	5.6%	0		45,314,334	6.2%	29,468,964	1.6%	50,928	0.6%	0	
Average Annual Change												
2 Year	2,544,776	6.6%			-4,251,692	7.2%	4,978,200	-1.7%	320	3.7%	0	0.0%
5 Year	-2,318,074	1.0%			-2,835,601	1.1%	2,636,100	0.3%	-5,992	0.8%	0	0.0%
10 Year	806,598	0.7%			-266,525	0.7%	1,031,250	-0.2%	-2,835	-0.2%	0	0.0%

Table 1-5 - Grayson RECC Comparative Annual Operating Data

Year	Residential Consumers	Residential kwh / Mo.	Residential Seasonal Consumers	Residential Seasonal kwh / Mo.	Commercial / Industrial (1 MW Or Less) Consumers	Commercial / Industrial (1 MW Or Less) kwh / Mo.	Commercial / Industrial (Over 1 MW) Consumers	Commercial / Industrial (Over 1 MW) kwh / Mo.	Public Street / Highway Lighting Consumers	Public Street / Highway Lighting kwh / Mo.	Public Authorities Consumers	Public Authorities kwh / Mo.
1999	12,935	973	0		1,178	2,744	1	1,532,400	1	6,338	0	
2000	12,974	1,029	0		1,150	3,020	1	1,505,600	1	6,375	0	
2001	13,183	1,042	0		1,175	3,124	1	1,537,800	1	6,375	0	
2002	13,470	1,092	0		1,201	3,363	1	1,533,695	1	6,438	0	
2003	13,632	1,068	0		1,193	3,351	1	1,596,372	1	6,606	0	
2004	13,909	1,055	0		1,202	3,579	1	1,532,372	1	6,675	0	
2005	14,067	1,109	0		1,233	3,823	1	1,460,972	1	6,700	0	
2006	14,239	1,043	0		1,276	3,668	1	1,302,973	1	6,900	0	
2007	14,342	1,120	0		1,287	3,832	1	1,355,372	1	6,972	0	
2008	14,422	1,123	0		1,298	3,819	1	1,357,372	1	6,741	0	
2009	14,386	1,071	0		1,290	3,675	1	1,573,598	1	2,722	0	
2010	14,260	1,122	0		1,271	3,848	1	1,547,447	1	4,497	0	
2011	14,225	1,041	0		1,243	3,608	1	1,626,047	1	4,191	0	
2012	14,197	1,016	0		1,189	2,991	2	1,208,124	1	4,217	0	
2013	14,180	1,074	0		1,208	3,126	2	1,227,874	1	4,244	0	
10 Year Avg.	55	1			2	-23	0	-36,850	0	-236		
5 Year Avg.	-48	-10			-18	-139	0	-25,900	0	-499		
2 Year Avg.	-23	17			-18	-241	1	-199,087	0	27		

Annual Changes In Grayson RECC's Residential Class

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Consumers	287	162	277	158	172	103	80	-36	-126	-35	-28	-17
kWh/month	50	-24	-13	54	-66	77	3	-52	51	-81	-25	59

23

Methodology and Results *(continued)*

The preliminary forecast was presented to Grayson RECC staff, and reviewed by the Rural Utilities Service (RUS) Field Representative. 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 Grayson RECC staff.

24

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 in each member system's economic region and the percent of total households served by the member system. Table 1-6 and Figure 1-8 report Grayson RECC's customer forecast.

The residential energy sales were analyzed by means of regression analysis, as a function of residential customers, base 30 heating degree days, base 55 heating degree days, base 65 cooling degree days and EKPC residential rates. Table 1-6 reports Grayson RECC's energy forecast.

Table 1-6
Grayson RECC - 2014 Load Forecast
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
1994	11,439	264	2.4	901	-5	-0.5	123,646	2,193	1.8
1995	11,702	263	2.3	956	55	6.1	134,204	10,558	8.5
1996	11,976	274	2.3	982	26	2.8	141,136	6,933	5.2
1997	12,199	223	1.9	969	-13	-1.3	141,902	765	0.5
1998	12,425	226	1.9	970	1	0.1	144,608	2,707	1.9
1999	12,935	510	4.1	973	3	0.3	151,055	6,447	4.5
2000	12,974	39	0.3	1,029	56	5.7	160,185	9,130	6.0
2001	13,183	209	1.6	1,042	13	1.3	164,833	4,648	2.9
2002	13,470	287	2.2	1,092	50	4.8	176,446	11,612	7.0
2003	13,632	162	1.2	1,068	-24	-2.2	174,698	-1,747	-1.0
2004	13,909	277	2.0	1,055	-13	-1.2	176,120	1,421	0.8
2005	14,067	158	1.1	1,109	54	5.1	187,260	11,140	6.3
2006	14,239	172	1.2	1,043	-66	-6.0	178,207	-9,053	-4.8
2007	14,342	103	0.7	1,120	77	7.4	192,737	14,531	8.2
2008	14,422	80	0.6	1,123	3	0.3	194,355	1,617	0.8
2009	14,386	-36	-0.2	1,071	-52	-4.6	184,913	-9,441	-4.9
2010	14,260	-126	-0.9	1,122	51	4.8	192,055	7,142	3.9
2011	14,225	-35	-0.2	1,041	-81	-7.3	177,675	-14,380	-7.5
2012	14,197	-28	-0.2	1,016	-25	-2.4	173,010	-4,665	-2.6
2013	14,180	-17	-0.1	1,074	59	5.8	182,764	9,754	5.6
2014	14,197	17	0.1	1,068	-6	-0.6	181,980	-784	-0.4
2015	14,214	17	0.1	1,074	5	0.5	183,113	1,134	0.6
2016	14,245	30	0.2	1,074	1	0.1	183,626	513	0.3
2017	14,275	30	0.2	1,075	0	0.0	184,075	449	0.2
2018	14,313	39	0.3	1,075	0	0.0	184,579	505	0.3
2019	14,358	45	0.3	1,074	0	0.0	185,119	540	0.3
2020	14,398	40	0.3	1,075	1	0.0	185,719	600	0.3
2021	14,433	35	0.2	1,077	2	0.1	186,447	728	0.4
2022	14,465	32	0.2	1,079	3	0.3	187,341	894	0.5
2023	14,498	33	0.2	1,082	3	0.3	188,310	969	0.5
2024	14,532	34	0.2	1,084	2	0.2	189,066	756	0.4
2025	14,572	40	0.3	1,086	1	0.1	189,823	757	0.4
2026	14,607	35	0.2	1,087	1	0.1	190,490	667	0.4
2027	14,629	22	0.2	1,089	2	0.2	191,178	688	0.4
2028	14,652	23	0.2	1,092	3	0.3	191,984	807	0.4
2029	14,677	25	0.2	1,095	3	0.2	192,775	790	0.4
2030	14,703	26	0.2	1,096	1	0.1	193,336	562	0.3
2031	14,730	27	0.2	1,097	1	0.1	193,913	577	0.3
2032	14,755	25	0.2	1,097	0	0.0	194,249	336	0.2
2033	14,783	28	0.2	1,097	0	0.0	194,637	388	0.2
2034	14,808	25	0.2	1,098	0	0.0	195,027	389	0.2

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.

27

Table 1-7
Grayson RECC - 2014 Load Forecast
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
1994	969	-11	-1.1	33	0	-0.4	31,785	-483	-1.5
1995	995	26	2.7	34	1	4.3	34,049	2,264	7.1
1996	1,004	9	0.9	35	1	2.2	35,127	1,078	3.2
1997	1,013	9	0.9	35	0	-0.7	35,184	58	0.2
1998	1,132	119	11.7	32	-3	-7.8	36,269	1,085	3.1
1999	1,178	46	4.1	33	1	2.8	38,784	2,515	6.9
2000	1,150	-28	-2.4	36	3	10.1	41,675	2,891	7.5
2001	1,175	25	2.2	37	1	3.5	44,052	2,377	5.7
2002	1,201	26	2.2	40	3	7.6	48,462	4,411	10.0
2003	1,193	-8	-0.7	40	0	-0.3	47,980	-482	-1.0
2004	1,202	9	0.8	43	3	6.8	51,626	3,648	7.6
2005	1,233	31	2.6	46	3	6.9	56,561	4,935	9.6
2006	1,276	43	3.5	44	-2	-4.1	56,158	-402	-0.7
2007	1,287	11	0.9	46	2	4.5	59,181	3,023	5.4
2008	1,298	11	0.9	46	0	-0.3	59,492	311	0.5
2009	1,290	-8	-0.6	44	-2	-3.8	56,889	-2,604	-4.4
2010	1,271	-19	-1.5	46	2	4.7	58,685	1,796	3.2
2011	1,243	-28	-2.2	43	-3	-6.5	53,818	-4,867	-8.3
2012	1,189	-54	-4.3	36	-7	-16.3	42,679	-11,139	-20.7
2013	1,208	19	1.6	38	2	5.6	45,314	2,635	6.2
2014	1,214	6	0.5	35	-3	-7.9	42,237	-3,077	-6.8
2015	1,224	9	0.8	36	1	2.9	43,638	1,401	3.3
2016	1,236	12	1.0	36	0	0.0	44,013	376	0.9
2017	1,247	11	0.9	36	0	0.0	44,627	613	1.4
2018	1,256	9	0.7	36	0	0.0	45,289	662	1.5
2019	1,264	9	0.7	36	0	0.0	45,710	421	0.9
2020	1,271	7	0.5	36	0	0.0	45,871	161	0.4
2021	1,279	8	0.6	36	0	0.0	46,242	372	0.8
2022	1,287	8	0.6	36	0	0.0	46,739	496	1.1
2023	1,295	8	0.6	37	1	2.8	47,303	564	1.2
2024	1,311	15	1.2	37	0	0.0	47,881	579	1.2
2025	1,319	8	0.6	37	0	0.0	48,576	694	1.5
2026	1,329	9	0.7	37	0	0.0	49,364	788	1.6
2027	1,338	10	0.7	37	0	0.0	49,887	523	1.1
2028	1,350	12	0.9	37	0	0.0	50,598	711	1.4
2029	1,364	13	1.0	38	1	2.7	51,316	718	1.4
2030	1,372	9	0.6	38	0	0.0	51,913	597	1.2
2031	1,385	12	0.9	38	0	0.0	52,538	625	1.2
2032	1,397	12	0.9	38	0	0.0	53,052	514	1.0
2033	1,407	10	0.7	38	0	0.0	53,557	505	1.0
2034	1,417	10	0.7	38	0	0.0	53,976	419	0.8

28

Methodology and Results *(continued)*
Large Commercial Forecast

Large commercial customers are those with loads 1 MW or greater. Grayson RECC currently has 2 customers in this class and is projected to stay that way through 2034. Large commercial results are reported in Table 1-8.

Table 1-8
Grayson RECC - 2014 Load Forecast
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
1994	1	0	0.0	14,664	-1,193	-7.5	14,664	-1,193	-7.5
1995	1	0	0.0	16,246	1,582	10.8	16,246	1,582	10.8
1996	1	0	0.0	16,819	574	3.5	16,819	574	3.5
1997	1	0	0.0	18,134	1,315	7.8	18,134	1,315	7.8
1998	1	0	0.0	18,502	367	2.0	18,502	367	2.0
1999	1	0	0.0	18,389	-113	-0.6	18,389	-113	-0.6
2000	1	0	0.0	18,067	-322	-1.7	18,067	-322	-1.7
2001	1	0	0.0	18,454	386	2.1	18,454	386	2.1
2002	1	0	0.0	18,404	-49	-0.3	18,404	-49	-0.3
2003	1	0	0.0	19,156	752	4.1	19,156	752	4.1
2004	1	0	0.0	18,388	-768	-4.0	18,388	-768	-4.0
2005	1	0	0.0	17,532	-857	-4.7	17,532	-857	-4.7
2006	1	0	0.0	15,636	-1,896	-10.8	15,636	-1,896	-10.8
2007	1	0	0.0	16,264	629	4.0	16,264	629	4.0
2008	1	0	0.0	16,288	24	0.1	16,288	24	0.1
2009	1	0	0.0	18,883	2,595	15.9	18,883	2,595	15.9
2010	1	0	0.0	18,569	-314	-1.7	18,569	-314	-1.7
2011	1	0	0.0	19,513	944	5.1	19,513	944	5.1
2012	2	1	100.0	14,498	-5,015	-2.6	28,995	9,482	48.6
2013	2	0	0.0	14,735	237	1.6	29,469	474	1.6
2014	2	0	0.0	14,872	137	0.9	29,743	274	0.9
2015	2	0	0.0	15,010	139	0.9	30,020	277	0.9
2016	2	0	0.0	15,150	140	0.9	30,301	280	0.9
2017	2	0	0.0	15,292	142	0.9	30,584	284	0.9
2018	2	0	0.0	15,436	144	0.9	30,872	287	0.9
2019	2	0	0.0	15,581	145	0.9	31,162	290	0.9
2020	2	0	0.0	15,728	147	0.9	31,456	294	0.9
2021	2	0	0.0	15,877	149	0.9	31,753	297	0.9
2022	2	0	0.0	16,027	150	0.9	32,054	301	0.9
2023	2	0	0.0	16,179	152	0.9	32,359	304	0.9
2024	2	0	0.0	16,333	154	1.0	32,667	308	1.0
2025	2	0	0.0	16,489	156	1.0	32,979	312	1.0
2026	2	0	0.0	16,647	158	1.0	33,294	315	1.0
2027	2	0	0.0	16,807	160	1.0	33,613	319	1.0
2028	2	0	0.0	16,968	162	1.0	33,936	323	1.0
2029	2	0	0.0	17,132	163	1.0	34,263	327	1.0
2030	2	0	0.0	17,297	165	1.0	34,594	331	1.0
2031	2	0	0.0	17,465	167	1.0	34,929	335	1.0
2032	2	0	0.0	17,634	169	1.0	35,268	339	1.0
2033	2	0	0.0	17,806	172	1.0	35,611	343	1.0
2034	2	0	0.0	17,979	174	1.0	35,958	347	1.0

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 1-9.

Table 1-9
Grayson RECC - 2014 Load Forecast
Public Street / Highway Lighting

	Customers			Use Per Customer				Class Sales	
	Annual Average	Annual Change	% Change	Monthly Average (kWh)	Change (kWh)	% Change	Total (MWh)	Annual Change (MWh)	% Change
1994	1	0	0.0	5,850	188	3.3	70	2	3.3
1995	1	0	0.0	5,911	61	1.0	71	1	1.0
1996	1	0	0.0	5,932	21	0.3	71	0	0.3
1997	1	0	0.0	6,075	143	2.4	73	2	2.4
1998	1	0	0.0	6,088	13	0.2	73	0	0.2
1999	1	0	0.0	6,338	250	4.1	76	3	4.1
2000	1	0	0.0	6,375	38	0.6	77	0	0.6
2001	1	0	0.0	6,375	0	0.0	77	0	0.0
2002	1	0	0.0	6,438	63	1.0	77	1	1.0
2003	1	0	0.0	6,606	169	2.6	79	2	2.6
2004	1	0	0.0	6,675	69	1.0	80	1	1.0
2005	1	0	0.0	6,700	25	0.4	80	0	0.4
2006	1	0	0.0	6,900	200	3.0	83	2	3.0
2007	1	0	0.0	6,972	72	1.0	84	1	1.0
2008	1	0	0.0	6,741	-231	-3.3	81	-3	-3.3
2009	1	0	0.0	2,722	-4,019	-59.6	33	-48	-59.6
2010	1	0	0.0	4,497	1,775	65.2	54	21	65.2
2011	1	0	0.0	4,191	-306	-6.8	50	-4	-6.8
2012	1	0	0.0	4,217	26	0.6	51	0	0.6
2013	1	0	0.0	4,244	27	0.6	51	0	0.6
2014	1	0	0.0	4,248	4	0.1	51	0	0.1
2015	1	0	0.0	4,252	4	0.1	51	0	0.1
2016	1	0	0.0	4,257	4	0.1	51	0	0.1
2017	1	0	0.0	4,261	4	0.1	51	0	0.1
2018	1	0	0.0	4,265	4	0.1	51	0	0.1
2019	1	0	0.0	4,270	4	0.1	51	0	0.1
2020	1	0	0.0	4,274	4	0.1	51	0	0.1
2021	1	0	0.0	4,278	4	0.1	51	0	0.1
2022	1	0	0.0	4,282	4	0.1	51	0	0.1
2023	1	0	0.0	4,287	4	0.1	51	0	0.1
2024	1	0	0.0	4,291	4	0.1	51	0	0.1
2025	1	0	0.0	4,295	4	0.1	52	0	0.1
2026	1	0	0.0	4,300	4	0.1	52	0	0.1
2027	1	0	0.0	4,304	4	0.1	52	0	0.1
2028	1	0	0.0	4,308	4	0.1	52	0	0.1
2029	1	0	0.0	4,312	4	0.1	52	0	0.1
2030	1	0	0.0	4,317	4	0.1	52	0	0.1
2031	1	0	0.0	4,321	4	0.1	52	0	0.1
2032	1	0	0.0	4,325	4	0.1	52	0	0.1
2033	1	0	0.0	4,330	4	0.1	52	0	0.1
2034	1	0	0.0	4,334	4	0.1	52	0	0.1

Methodology and Results *(continued)*
Peak Day Weather Scenarios

Extreme temperatures can dramatically influence Grayson RECC's peak demands. Table 1-10 and Figure 1-9 reports the impact of extreme weather on system demands.

Table 1-10: Seasonal Peaks by Weather Scenario

Winter Peak Day Minimum Temperatures				
	Mild	Normal	**Extreme**	
Degrees	10	-2	-9	-14	-21
Probability	*99%*	*50%*	*20%*	*10%*	*3%*
Occurs Once Every		**2 Years**	**5 Years**	**10 Years**	**30 Years**

Noncoincident Winter Peak Demand - MW				
Season	Mild	Normal	Extreme		
2014 - 15	72	80	85	89	94
2015- 16	72	81	85	89	94
2016 - 17	72	81	86	89	94
2017 - 18	73	81	86	89	94
2018 - 19	73	81	86	90	95
2019 - 20	73	81	86	90	95
2020 - 21	73	82	86	90	95
2021 - 22	73	82	87	90	95
2022 - 23	73	82	87	90	95
2023 - 24	73	82	87	90	95
2024 - 25	73	82	87	91	96
2025 - 26	74	82	87	91	96
2026 - 27	74	82	87	91	96
2027 - 28	74	83	88	91	96
2028 - 29	74	83	88	91	96
2029 - 30	74	83	88	92	97
2030 - 31	74	83	88	92	97
2031 - 32	74	83	88	92	97
2032 - 33	74	83	88	92	97
2033 - 34	75	83	88	92	97

Summer Peak Day Maximum Temperatures			
	Normal	**Extreme**	
Degrees	95	98	100	103
Probability	*50%*	*20%*	*10%*	*3%*
	2 Years	**5 Years**	**10 Years**	**30 Years**

Noncoincident Summer Peak Demand - MW			
Year	Normal	Extreme		
2014	53	57	59	62
2015	54	57	59	62
2016	54	57	59	62
2017	54	58	60	63
2018	55	58	60	63
2019	55	58	60	63
2020	55	58	61	64
2021	56	59	61	64
2022	56	59	61	64
2023	56	59	62	65
2024	57	60	62	65
2025	57	60	62	66
2026	57	61	63	66
2027	58	61	63	66
2028	58	61	64	67
2029	58	62	64	67
2030	59	62	64	68
2031	59	62	65	68
2032	59	63	65	68
2033	60	63	65	69
2034	60	63	65	69

Grayson RECC - Normal Peaks and T&D Planning Peaks