



# BEC 2014-2029 LOAD FORECAST

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**2014-2029 Load Forecast Narrative**

The Beartooth Electric Cooperative (BEC) Load Forecast (LF) is the result of a process that is driven by our mission of providing safe, reliable, fiscally responsible power to our members. To achieve its mission, the Board of Trustees and management create and periodically update a Load Forecast. The key components of a LF examine the historical kWh (energy) consumption, kW (demand) requirements, load factor, and system losses for a 10 year historical period and projects a 15 year expected change in same. This LF will be incorporated in the system’s 4 year Work Plan, and the cooperative’s continuing mission outlined above. This 2014 – 2029 LF aids the board in achieving BEC’s mission to continue service excellence and system reliability given the resources provided, and with implementation of best management practices.

**Load Forecast Organization**

This LF is organized as follows:

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**2014-2029 LF Goals**

Load forecast goals as follows:

- Examine historical kWh consumption per meter per class and reasonably determine 5, 10 and 15 year projections
- Examine historical kW, noting this demand is very weather sensitive and making adjustments accordingly to provide reliable and uninterrupted capacity
- Review the math “results” and make necessary management assumptions to align results with work plan and forecasting

**Executive Summary**

**Key Data Analysis:**

	reference page	Total Meters				Proj. Average % </>			Proj. Compound % </>		
		2014	2019	2024	2029	2019	2024	2029	2019	2024	2029
<i>Projected Meters</i>	8, 19	5866	6156	6549	6923	0.99%	1.163%	1.201%	0.970%	1.107%	1.111%
<i>Projected mWh Sales</i>	19	71183	68303	71671	76126	-0.81%	0.069%	0.463%	-0.823%	0.068%	0.449%
<i>kWh/Meter/Month</i>		1011	925	912	916	-1.71%	-0.981%	-0.626%	-1.775%	-1.027%	-0.655%
<i>Calculated kW</i>	19	15826	16244	17045	18104	0.53%	0.770%	0.960%	0.523%	0.745%	0.901%
<i>Projected kW 4-yr Work Plan</i>	6	17219	19011			2.08%			2.000%		
<i>Projected System Loss</i>	21	14.26%	14%	14%	14%						

Allocation of Projections by Class																
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<i>Number of Meters</i>																
Residential	5,404	5,448	5,492	5,535	5,579	5,623	5,688	5,752	5,817	5,881	5,946	6,014	6,083	6,151	6,220	6,288
Irrigation	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
Small Commercial	357	370	383	397	410	423	436	449	462	475	488	493	499	505	510	516
Large Commercial	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<i>kWh/Meter/Month</i>																
Residential	767	748	730	712	693	675	671	668	665	661	658	658	658	658	658	658
Irrigation	2,475	2,439	2,403	2,366	2,330	2,294	2,230	2,166	2,102	2,038	1,974	2,038	2,102	2,166	2,229	2,293
Small Commercial	1,754	1,699	1,645	1,590	1,535	1,480	1,554	1,627	1,701	1,774	1,847	1,847	1,847	1,846	1,846	1,845
Large Commercial	163,833	163,833	163,833	163,833	163,833	163,833	171,142	178,450	185,758	193,067	200,375	200,717	201,058	201,400	201,742	202,083

- The LF is very conservative, and along the lines of economic and demographic projects from various sources in the body of this report. The highlighted Key Data Analysis points show a very small growth over the next 15 years in meters, and a slightly improving, but still negative consumption per meter.

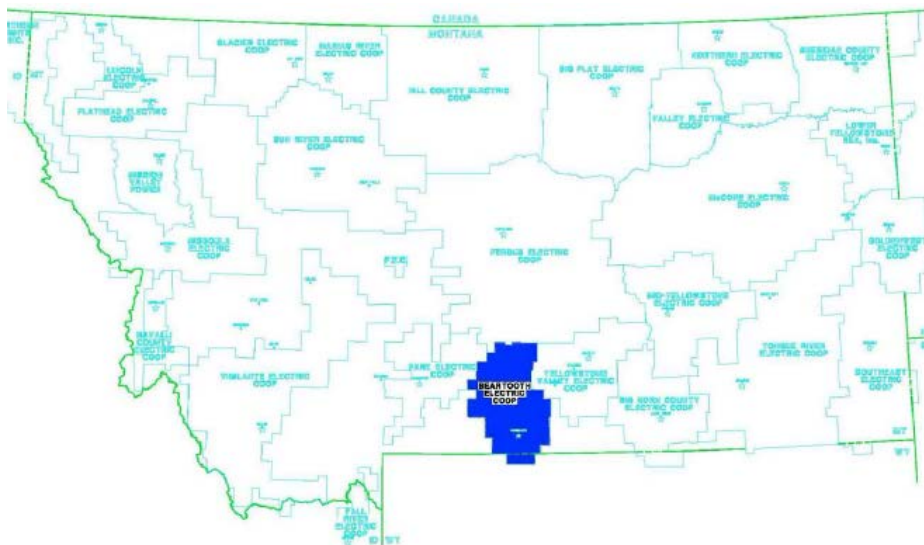
- Because demand can be “calculated” from consumption, assuming a load factor, the growth of  $\frac{1}{2}\%$  and  $\frac{3}{4}\%$  would seem logical. However, it should be noted the system peak during a winter storm in 2013 pushed demand to 16,900 kW. This confirms math cannot always predict reality. When it gets cold enough, consumers will disregard rate elasticity and conservation and just seek warmer temperatures. The system has to be built to satisfy this consumer behavior. Thus the 4 year Work Plan uses projected (2%) rather than calculated (.53%) growth in demand.
- Also noted are the increased system losses. Historically BEC has not included transmission losses, thus the historical picture is distorted. If a kWh is purchased and not sold, it is lost. The 2013 values and future projections include this corrected loss.

## System Area Description

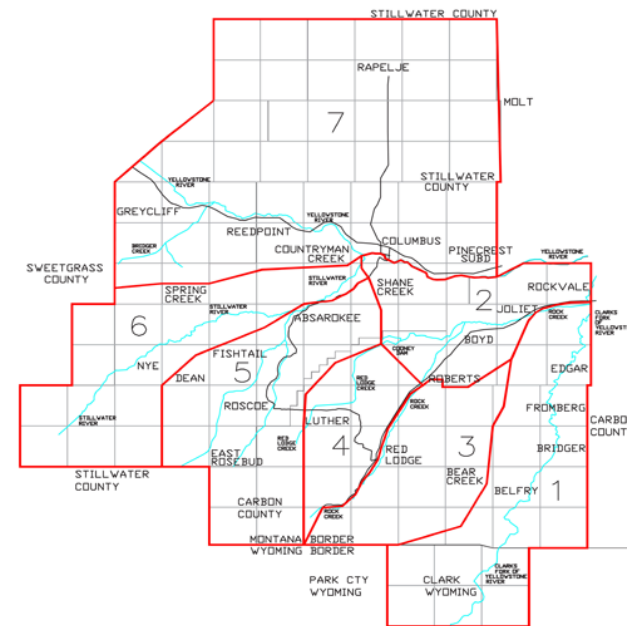
### Location:

Beartooth Electric Cooperative, Inc. was incorporated in 1938. The cooperative started in 1939 when the State of Montana approved the conversion of the Stillwater Rural Electrification Association in Absarokee, Montana to Beartooth Electric Cooperative, Inc. In 1940, the co-op awarded a contract to begin erecting power lines. At about the same time, BEC purchased the site of its first substation in Absarokee. BEC energized the substation and lines the following year. Four months later, a substation near Edgar, Montana was added. In 1942, BEC acquired the electric distribution system in the Town of Roberts and moved the headquarter's office from Absarokee to Red Lodge, Montana.

BEC serves the rural areas of Stillwater, Carbon, and Sweet Grass counties in Montana and Park County, in Wyoming. In 2013 BEC supplied electricity to 5,753 meters over 1,775 miles of line supported by 10 substations and crews in two primary locations.



**BEARTOOTH ELECTRIC COOPERATIVE  
SERVICE AREA MAP**



***Geography:***

The service area lies in the Clarks Fork, Rock Creek, Stillwater and Yellowstone River valleys between the Beartooth and Pryor mountain uplifts. The elevations in these river valleys range from approximately 3,300 feet to approximately 6,500 feet with the southern boundaries largely bounded by rugged mountains. The area between these river valleys consist of dissected upland bench with prominent ridges and escarpments. Exposed formations in the area consist exclusively of rocks of sedimentary origin, i.e. sandstone, shale, mudstone, and interblended limestone of the Cretaceous or younger age. Mountain building during late Cretaceous and early Tertiary resulted in the uplift of massive fault blocks that created the Pryor and Beartooth mountains as well as stresses in sedimentary bedrock that led to lateral displacement along faults.

The Beartooth mountains are composed of Precambrian granite and crystalline metamorphic rocks dated at approximately 4 billion years old, making these rocks some of the oldest on Earth. The Stillwater igneous complex within the mountains is the location of the largest known deposits of platinum and chromium and the second largest deposits of nickel found in the U.S.<sup>1</sup>

The remoteness of the region contributed to their obscurity until the 1870s. The Crow tribe of Native Americans used the valleys of the mountains for hunting game animals and for winter shelter from the harsh winds of the plains. Though trappers entered the region in the 1830s, formal exploration by the U.S. Government did not occur until 1878. Since then, almost 400 species of plants have been discovered and the Beartooths are considered to be the most biologically unique mountain range in North America. The region is also home to one of the populations of Grizzly Bears outside of Alaska and Canada. Black bears, mountain goats, bighorn sheep, elk, moose, wolverine, mountain lion, and lynx are also found here.<sup>2</sup>

The Pryor Mountains are a mountain range in Carbon and Big Horn counties of Montana. They are located on the Crow Indian Reservation and the Custer National Forest, and portions of them are on private land. They lie south of Billings, Montana, and north of Lovell, Wyoming.

The mountains are named for Sergeant Nathaniel Hale Pryor, a member of the Lewis and Clark Expedition who vainly pursued horses stolen from the expedition in the area. The Crow Nation, a Native American tribe which lived nearby, called the mountains Baahpuuo Isawaxaawuua ("Hitting Rock Mountains") because of the abundance of flint there (which was chipped into arrowheads).

According to Crow Nation folklore, Little People (a race of 18-inch high, dwarf-like people with spiritual powers) lived in these mountains.<sup>3</sup>

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<sup>1</sup> [http://en.wikipedia.org/wiki/Beartooth\\_Mountains](http://en.wikipedia.org/wiki/Beartooth_Mountains)

<sup>2</sup> [en.wikipedia.org/wiki/Beartooth\\_Mountains](http://en.wikipedia.org/wiki/Beartooth_Mountains)

<sup>3</sup> [http://en.wikipedia.org/wiki/Pryor\\_Mountains](http://en.wikipedia.org/wiki/Pryor_Mountains)

***Climate:***

Weather has a significant effect on the load forecast for the co-op. An unusually cold winter can effect kW consumption as shown in the December 2013 winter storm setting a peak of 16,900 kW as compared to the prior year of 14,668 kW, a 15% change. Elevations in the service territory range from 9,000 feet, down to 3,000 feet. Therefore, the climate can differ considerably area to area, as can the heating degree days (HDD).

Degree days are essentially a simplified representation of outside air-temperature data. They are widely used in the energy industry for calculations relating to the effect of outside air temperature on building energy consumption. "*Heating degree days*", or "*HDD*", are a measure of how much (in degrees), and for how long (in days), outside air temperature was *lower* than a specific "*base temperature*" (or "*balance point*"). They are used for calculations relating to the energy consumption required to *heat* buildings.<sup>4</sup>

Average precipitation in Carbon County, Mt is 16.98 inches<sup>5</sup>, dropping to 11.15 in Park County, WY.<sup>6</sup> Snowfall in Carbon County, MT averages 74.37<sup>7</sup> and drops to 43.03 in Park County, WY.<sup>8</sup> The dramatic differences within the service territory adds to the challenge of predicting adequate demand (kW) to meet the needs of members during that “worst case” scenario.

“And it does snow a lot in Red Lodge. But the proximity of the Beartooth Mountains seems to moderate the climate, so that the temperature may be 20 degrees different than at Billings, 50 miles to the northeast. Many of those cold days are accompanied by glorious sunshine and clear skies. Red Lodge seems to be especially blessed by clear skies in the Winter; many days the clouds gather around the tops of the mountains while Red Lodge is enjoying the sun. And Red Lodge does participate in the famous Chinooks, when the temperature can rise 20 to 40 degrees over several hours.”<sup>9</sup>

In 2011, the co-op’s noncoincident peak demand (kW) was 16,550 dropping to 14,602 in 2012 and again rising to 16,900 in 2013. ***In determining a reasonable peak demand for Work Plan purposes, management at BEC chose to add to the known demand of 2011 and build from that at 2% per year.***

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<sup>4</sup> <http://www.degreedays.net/>

<sup>5</sup> <http://www.usa.com/carbon-county-mt-weather.htm>

<sup>6</sup> <http://www.usa.com/park-county-wy-weather.htm>

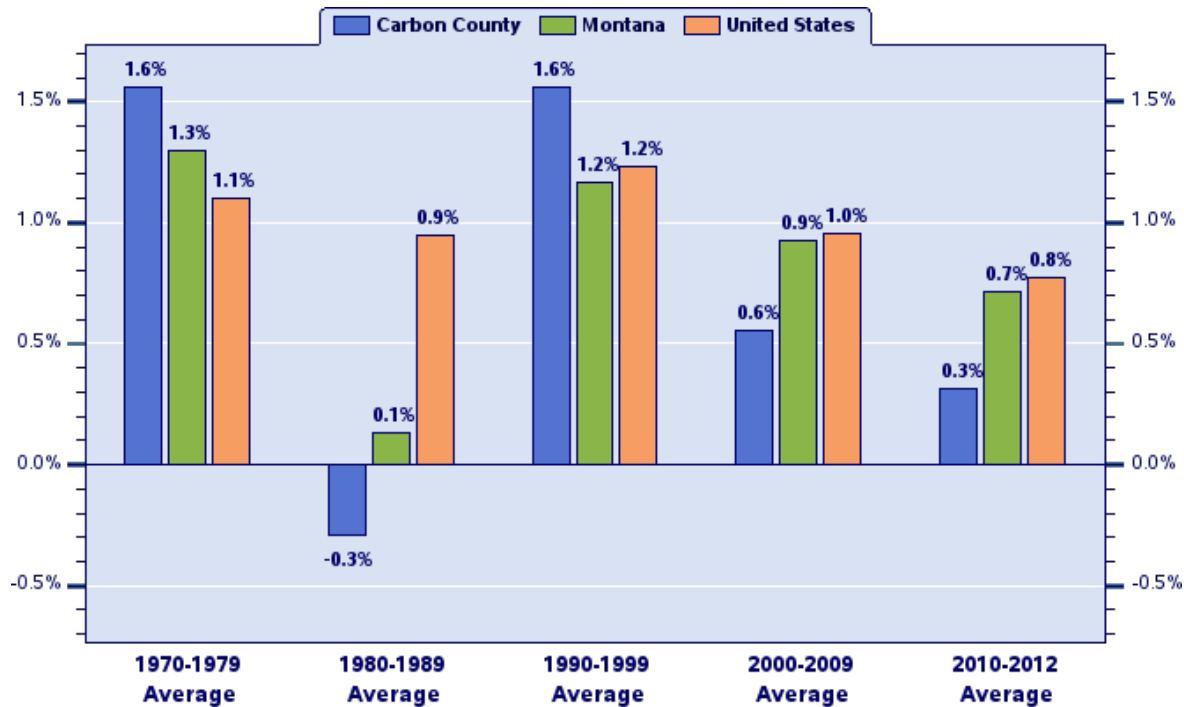
<sup>7</sup> <http://www.usa.com/carbon-county-mt-weather.htm>

<sup>8</sup> <http://www.usa.com/park-county-wy-weather.htm>

<sup>9</sup> [http://www.imt.net/~gplains/rl\\_info/rl\\_clim.htm](http://www.imt.net/~gplains/rl_info/rl_clim.htm)

**Population:**

At the US Census of 2010, it was confirmed that 989,415 people were living in Montana, an increase of 9.7% from the findings of 2000. The Montana population surpassed 1 million for the first time in 2012, and it now stands at 1,013,097.<sup>10</sup> Carbon County, where BEC is headquartered showed an increase in 2000-2009 of .6% and in 2010-2012 a drop to .3%.<sup>11</sup>



Source: Montana.REAProject.org (1-7-2014)  
Data: Regional Income Division, BEA (11-21-2013)

<sup>10</sup> <http://worldpopulationreview.com/states/montana-population/>

<sup>11</sup> <http://montana.reaproject.org/analysis/comparative-trends-analysis/population/tools/300009/300000/>



**Montana County Population Projections 2003-2024**

<b>Population Projections</b>						
	<b>Carbon</b>	<b>Sweet Grass</b>	<b>Stillwater</b>		<b>Total</b>	<b>BEC</b>
2003	9,747	3,591	8,451	▼	21,789	5,008
2004	9,796	3,676	8,435	▼	21,907	5,146
2005	9,921	3,675	8,481	▼	22,077	5,297
2006	9,916	3,697	8,659	▼	22,272	5,388
2007	9,973	3,778	8,867	▼	22,618	5,480
2008	9,965	3,755	8,945	▼	22,665	5,609
2009	10,033	3,731	9,077	▼	22,841	5,653
2010	10,079	3,622	9,110	▼	22,811	5,680
2011	9,973	3,725	9,245	▼	22,943	5,680
2012	9,886	3,813	9,360	▼	23,059	5,754
2013	9,805	3,897	9,457	▼	23,159	5,831
2014	9,727	3,970	9,532	▼	23,229	5,866
2015	9,663	4,031	9,596	▼	23,290	5,924
2016	9,608	4,085	9,650	▼	23,343	5,982
2017	9,560	4,134	9,691	▼	23,385	6,040
2018	9,515	4,173	9,719	▼	23,407	6,098
2019	9,479	4,210	9,741	▼	23,430	6,156
2020	9,443	4,241	9,751	▼	23,435	6,235
2021	9,418	4,266	9,747	▼	23,431	6,313
2022	9,402	4,285	9,729	▼	23,416	6,392
2023	9,385	4,301	9,694	▼	23,380	6,470
2024	9,363	4,312	9,643	▼	23,318	6,549
10 Yr. Compound Rate of Growth	-0.38%	0.83%	0.12%		0.04%	1.11%
5 Yr. Compound Rate of Growth	-0.52%	1.18%	0.43%		0.17%	0.97%

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<sup>12</sup> [http://ceic.mt.gov/Population/PopProjections\\_AllCountiesPage.aspx](http://ceic.mt.gov/Population/PopProjections_AllCountiesPage.aspx)

***Economic Conditions:***

The Montana economy has been impacted by the global economic recession that started in December 2007 and ended in June 2009. Throughout the recession, the Montana economy outperformed the U.S. economy, with lower unemployment, smaller job losses, and stronger personal income growth than the national average. Montana has been gaining jobs since the start of 2011, and jobs in the private sector have been increasing since mid-2010. From 2007 to 2010, the national recession caused payroll employment in Montana to decline 4% (compared to 5.6% nationally), leaving a large number of Montana workers unemployed. Job growth exiting the recession is expected to be slower than before the recession, with payroll employment growth from 2011 to 2021 expected to average 1.4% to 1.5% annually compared to 2.2% per year from 2000 to 2007.<sup>13</sup>

Though the economy outperformed the U.S. one must be mindful of the income disparity between median U.S. and Montana as represented in the table below:

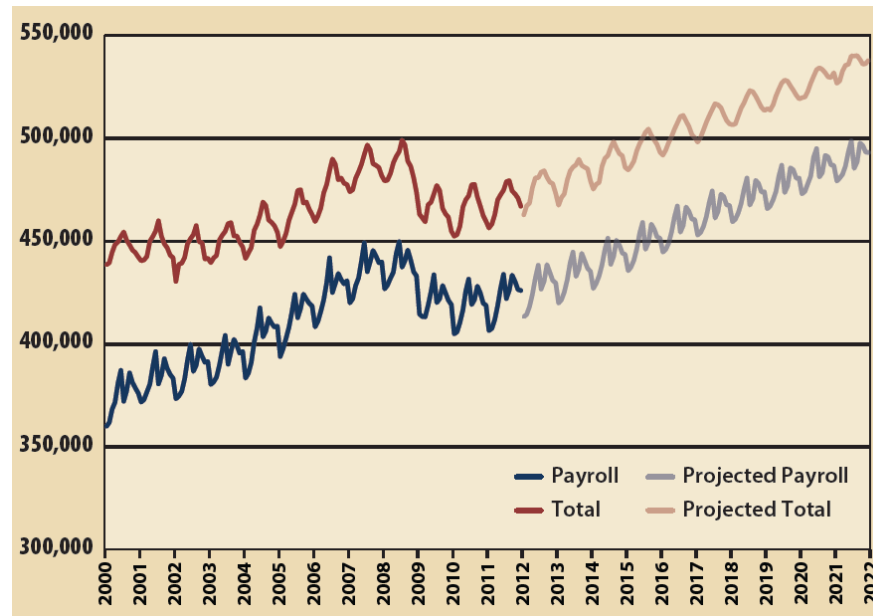
<b>Median Household Income Statistics</b>		
	2008-2012	% </> to U.S. Median
<b>United States</b>	\$ 53,046	
Montana	\$ 45,456	-17%
Stillwater County	\$ 53,533	1%
Park County, WY	\$ 51,449	-3%
Carbon County	\$ 47,030	-13%
Sweetgrass County	\$ 44,179	-20%

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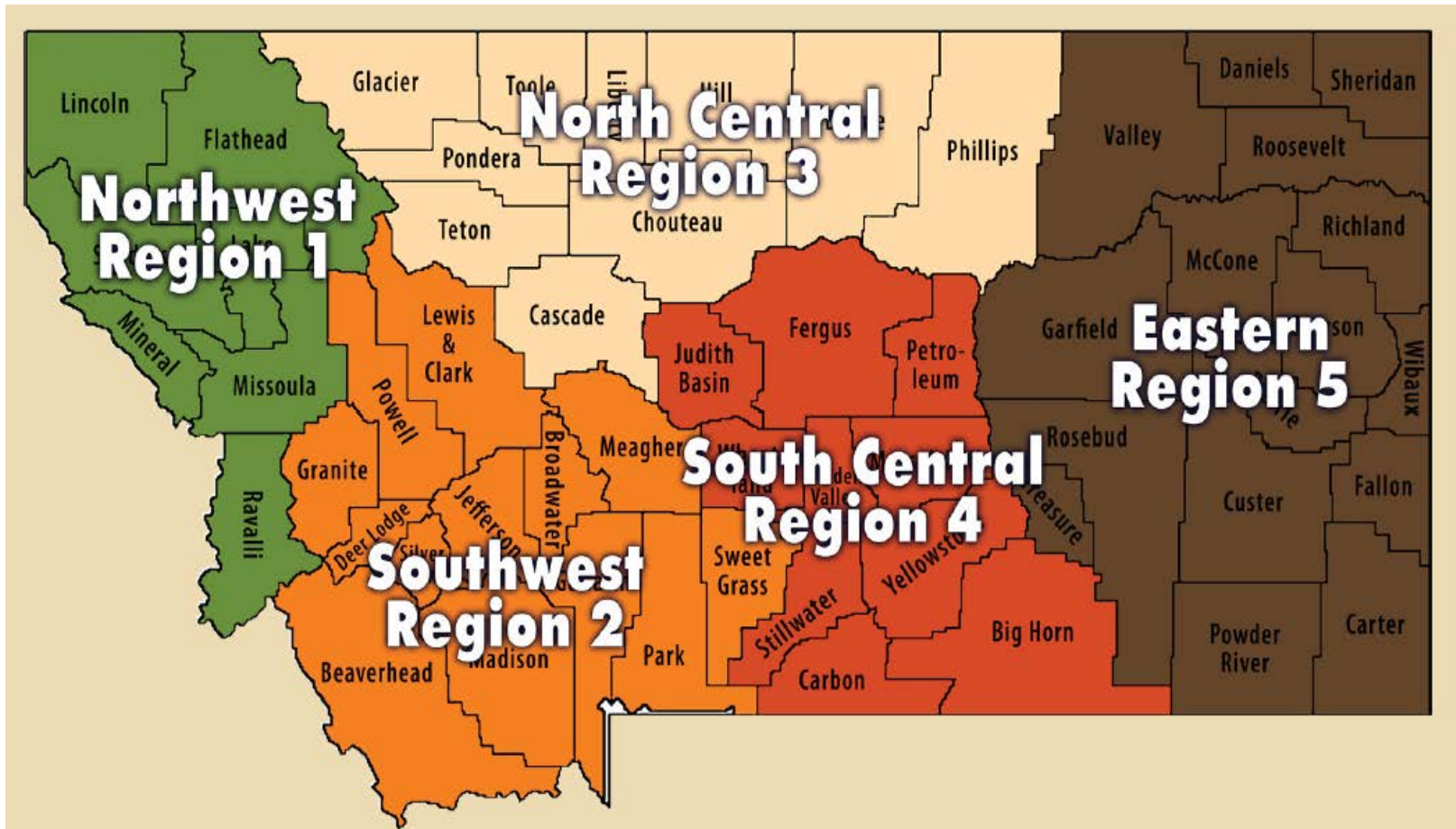
<sup>13</sup> [http://www.ourfactyourfuture.org/admin/uploadedPublications/4543\\_projections.pdf](http://www.ourfactyourfuture.org/admin/uploadedPublications/4543_projections.pdf)

<sup>14</sup> <http://quickfacts.census.gov/qfd/states/30000.html>

**Montana Total and Payroll Employment, 2000-2011 Actual, 2012 to 2021 Projected**

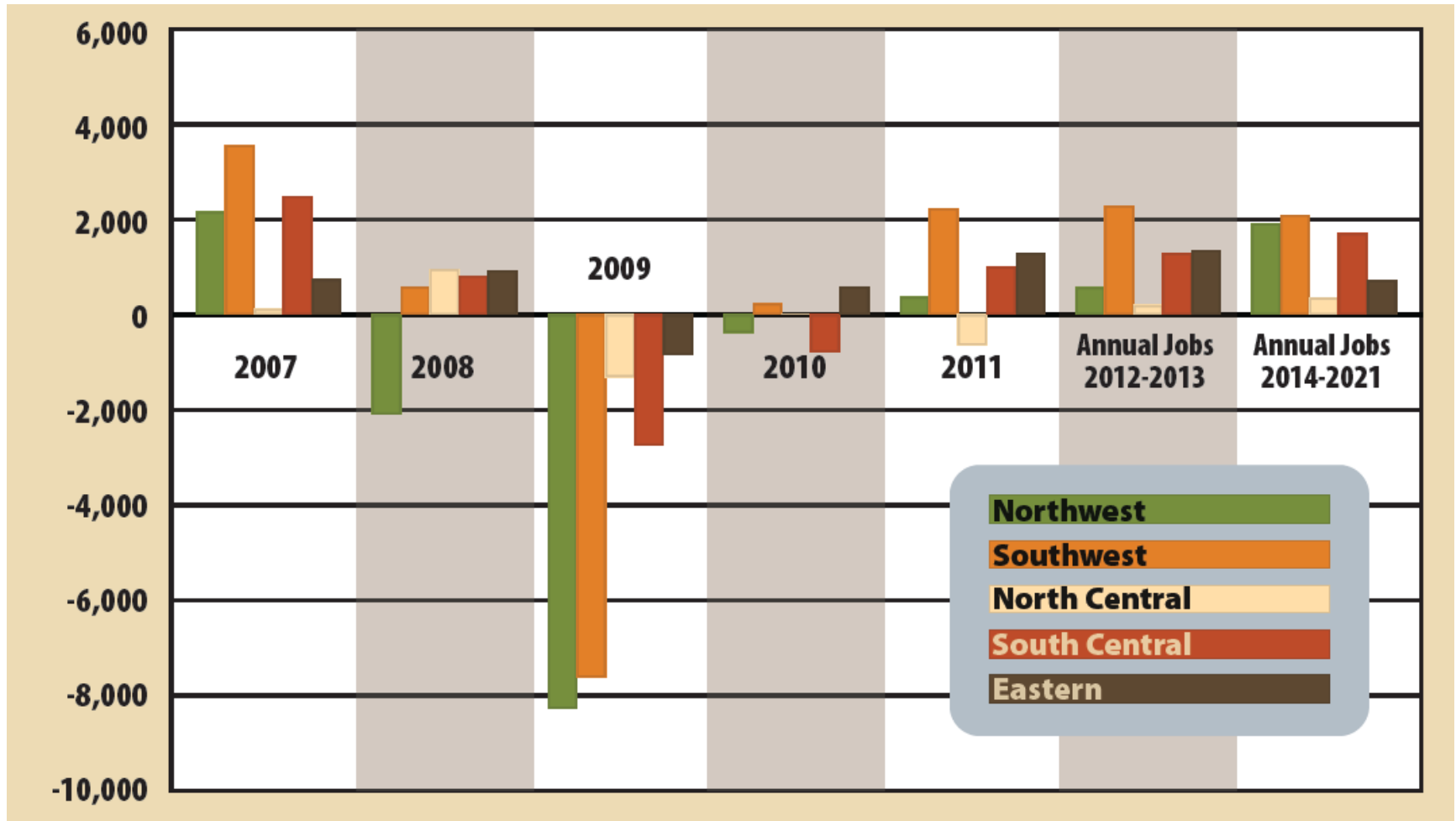


*Montana Job Service Regions*



*Produced by the Research and Analysis Bureau, Montana Department of Labor and Industry*

*Job Change by Region, 2007 to 2011 actual, 2012 to 2021 projected*



<sup>15</sup> [http://www.ourfactsyourfuture.org/admin/uploadedPublications/4543\\_projections.pdf](http://www.ourfactsyourfuture.org/admin/uploadedPublications/4543_projections.pdf)

Produced by the Research and Analysis Bureau,  
Montana Department of Labor and Industry  
Barbara Wagner, Senior Economist

### Montana Employment Projections 2011 – 2021

#### *Executive Summary*

- Jobs are projected to grow at 1.4% in 2012 and 2013, and then at 1.5% per year from 2014 to 2021. This growth rate is slightly faster than the 2001 to 2011 average of 1.1%, but is slower than the 2.2% growth during the housing bubble from 2000 to 2007. At this rate of growth, Montana is expected to regain its pre-recession employment peak in late 2013 or early 2014.
- During 2012 and 2013, health care, manufacturing, business services, and natural resources are expected to be the fastest growing industries. From 2014 to 2021, manufacturing will return to its long-term downward trend, but growth in the health care, business services, and natural resource industries will continue to be strong.
- Construction is expected to grow at a rapid pace of 3.1% annually from 2014 to 2021, making it the fastest growing industry during that timeframe. However, because of the large job losses during the recession, construction is unlikely to regain its pre-recession peak until after 2021.
- Registered nurses, retail salespersons, home healthcare aids, personal care aides, and bookkeeping clerks are the five occupations with the fastest job growth in the next ten years. Because health care did not have job losses during the recession, health care occupations are the jobs with the greatest worker demand.
- Overall, Montana's workforce will need to become more educated to fill future jobs. Workers with a higher level of education will be in demand, while there will be an oversupply of workers with only a high school diploma.<sup>16</sup>

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<sup>16</sup> [http://www.ourfactsyourfuture.org/admin/uploadedPublications/4543\\_projections.pdf](http://www.ourfactsyourfuture.org/admin/uploadedPublications/4543_projections.pdf)

Income projections for Montana show both the historical and projected tax revenues. Income taxes show a significant decline from 2010 to 2030. *“Montana will become much older in coming decades as the “Baby Boom” generation reaches traditional retirement age. Changing demographics will affect state and local government budgets in a variety of ways.*<sup>17</sup>

Montana Tax Collections							
Total in Millions							
Year	Source						
	Total	Individual	Corporation	Property	License	All Other	% </>
2008	2458	870	162	220	311	895	
2009	2407	827	164	235	298	883	-2.07%
2010	2143	715	93	236	309	790	-10.97%
2011	2304	813	124	244	308	815	7.51%
2012	2459	900	132	257	316	854	6.73%

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Ave Residential Bill 2012					
	kWh Consumed	¢/kWh	\$/month	% </> to U.S.	% > MT
U.S.	903	11.88	107.28		
Montana	842	10.08	84.88	-26%	
BEC	763	17.13	130.89	18%	35%

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<sup>17</sup> <http://mtdh.ruralinstitute.umt.edu/blog/wp-content/uploads/Project-2030-Final-Summary.pdf>

<sup>18</sup> <http://www.governing.com/gov-data/state-tax-revenue-data.html>

<sup>19</sup> [http://www.eia.gov/electricity/sales\\_revenue\\_price/pdf/table5\\_a.pdf](http://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf)

Table 11 summarizes the results for selected tax revenues. Residential property taxes are expected to increase by \$19 per Montana resident, while income taxes are expected to fall by \$42 per Montanan. The total effect is a decline in tax revenues of \$23 per resident.

Table 2. Summary of Selected Tax Revenues.

Dollars per Montana resident

	2010	2030	Change
Property Taxes	525	544	19
Income Taxes	755	713	-42
Total	1,279	1,255	-23

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The amount of electricity used in the average household has fallen to 2001 levels, according to government data.

The Energy Information Administration (EIA) found that power usage in 2013 fell to 10,819 kilowatt-hours per U.S. household. In 2001, average household power usage was 10,535 kWh. EIA attributes the decline to more energy-efficient housing, appliances and gadgets.

EIA reported last month that overall electricity sales continue to decrease despite a slow uptick in domestic economic growth. Since the early 2000s, states have ramped up their home energy standards. Stricter base-line efficiency standards also may have contributed to the drop in household power usage.

In recent years, people have begun using more devices. But the Energy Department predicts the average residential electricity use per customer will once again drop in 2014, by 1 percent. – *Greenwire Publication*.

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<sup>20</sup> <http://mtdh.ruralinstitute.umt.edu/blog/wp-content/uploads/Project-2030-Final-Summary.pdf>

<sup>21</sup> January 3, 2014 Big Skylights



**The co-op's LF has utilized these conservative suggestions in its planning, yet allowed the growth in demand to meet that "worst case" scenario where no matter the income, when it gets cold enough, heat will be demanded.**

### **Additional Considerations**

"In 2008, BEC signed an all requirements wholesale power contract with Southern that required it pay all of Southern's expenses and debts for 40 years even if Southern went out of business. The consequences of this action and Southern's 2011 bankruptcy could be substantial for BEC members. When Southern filed for bankruptcy protection in October, 2011, it had debts of \$21.4M. It had yet, however, to start repayment of \$85 million (the majority of which is financed by Prudential Finance) to build phase one of its Highwood Generating Station plant near Great Falls. In a worst case scenario, BEC could be liable for millions of dollars.

Shortly after Southern declared bankruptcy, the federal bankruptcy court cancelled Southern's power supply contract with PPL, although it allowed PPL the option of suing for damages later. In Chapter 11 reorganization, the bankrupt business proposes a plan to pay creditors and may keep operating. Some creditors may be paid over time, while others may settle for less than they're owed. Southern is covering their losses now by purchasing power at market rates that are about half the costs of the current wholesale rate per kWh being charged its distribution customers. In early 2013 a bankruptcy plan was presented to the court. It is anticipated a bankruptcy plan could be confirmed in 2014. The BEC board favors a liquidation for Southern and a sale of HGS. We will have more information about our future power supply after the first part of the year.

On November 28<sup>th</sup> the Southern Bankruptcy Trustee was terminated and Southern became a debtor in possession. The Southern Board has been reorganized and is moving forward.

Power supply costs are set at the June, 2011 rate as presented by Southern, namely; energy cost per kilowatt hour at \$.04409, and demand cost per kilowatt at \$11.71. The present blended costs of wholesale power including line loss put the cost of wholesale power over \$.072 per Kwh." <sup>22</sup>

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<sup>22</sup> BEC 2014 Budget

Historically, system losses are approximately 10%. Recently, it was discovered the accounting for system losses did not include Northwest Energy transmission losses of approximately 5%. This LF shows a correction in the past year and budgeted year includes the 5%. The historical **does not** include same.

# Load Forecast, Beartooth Electric Cooperative, Inc.

2014-2029



Historical ANNUAL OPERATING DATA		LOAD FORECAST										AVERAGE COSTS			
		MWH PURCHASED AND GENERATED	% INCREASE	MWH SOLD	% INCREASE	MWH LOSS	% LOSS	MW DEMANDS ON ALL SUBSTATIONS	% ANNUAL LOAD FACTOR	AVG. NO. OF METERS	MILES OF LINE ENERGIZED	METER DENSITY	TOTAL COST OF PURCHASED POWER	MILLS/MWH PURCHASED	
YEAR															
2002	61,566		54,962	6,604	10.73%	13301	52.839%	4,883	1575	3.10	\$ 1,934,383	\$ 31.4197			
2003	61,997	0.70%	56,071	5,926	9.56%	14174	49.931%	5,008	1596	3.14	\$ 2,043,107	\$ 32.9549			
2004	60,417	-2.55%	55,048	5,369	8.89%	14772	46.689%	5,146	1607	3.20	\$ 1,968,251	\$ 32.5778			
2005	63,072	4.39%	57,810	5,262	8.34%	15306	47.040%	5,297	1641	3.23	\$ 2,156,373	\$ 34.1891			
2006	66,409	5.29%	59,615	6,794	10.23%	15550	48.732%	5,388	1671	3.22	\$ 2,428,977	\$ 36.5760			
2007	70,787	6.59%	62,020	8,767	12.39%	16715	48.344%	5,480	1686	3.25	\$ 2,752,362	\$ 38.8823			
2008	72,854	2.92%	64,227	8,627	11.84%	19068	45.616%	5,609	1704	3.29	\$ 3,289,212	\$ 45.1480			
2009	71,062	-2.46%	64,031	7,031	9.89%	16792	48.309%	5,653	1726	3.28	\$ 3,838,585	\$ 54.0174			
2010	69,455	-2.26%	63,129	6,326	9.11%	16254	48.780%	5,680	1732	3.28	\$ 4,385,519	\$ 63.1419			
2011	71,243	2.57%	66,985	4,258	5.98%	16550	49.141%	5,680	1740	3.26	\$ 4,914,864	\$ 68.9873			
2012	69,087	-3.03%	62,108	6,979	10.10%	14668	53.768%	5,754	1749	3.29	\$ 4,934,094	\$ 71.4186			
2013	71,602	3.64%	62,060	9,542	13.33%	16900	48.365%	5,831	1760	3.31	\$ 4,917,853	\$ 68.6632			
2014 Budgeted	72,661	1.48%	62,298	10,363	14.26%	15826	52.411%	5,866	1770	3.31	\$ 5,120,392	\$ 70.4696			
10 YR TOTAL	698,232		624,283	73,949	10.59%										
AVERAGE ANNUAL															
PERCENT INCREASE		1.91%		1.32%	10.55%	1.09%		1.32%	0.97%	0.35%		8.24%			

# Load Forecast, Beartooth Electric Cooperative, Inc.


2014-2029

## LOAD FORECAST

### COMPARATIVE ANNUAL OPERATING DATA

YEAR	RURAL/RESIDENTIAL		IRRIGATION		SMALL COMMERCIAL		LARGE COMMERCIAL		NO. NEW		TOTAL REVENUE/PRODUCING METERS	
	NO MTR.	ANNUAL MWH	NO MTR.	ANNUAL MWH	NO MTR.	ANNUAL MWH	NO MTR.	ANNUAL MWH	MTR/YEAR	NO. NEW	NO. MTR.	> EA. YR.
2002	4,515	46,544	146	2,208	220	4,010	2	2,200	48	4,883	60	54,962
2003	4,633	47,424	148	2,757	225	3,719	2	2,191	58	5,008	125	56,071
2004	4,738	46,856	158	2,547	228	3,804	2	2,041	62	5,146	138	55,648
2005	4,884	49,684	166	1,918	245	4,191	2	2,018	62	5,297	151	57,810
2006	4,989	50,407	162	2,785	265	4,171	2	2,252	113	5,388	91	59,615
2007	5,061	53,235	154	2,411	273	4,483	2	1,891	100	5,480	92	62,020
2008	5,154	54,470	170	2,602	283	5,091	2	2,064	118	5,609	129	64,227
2009	5,185	53,937	176	2,528	291	6,076	1	1,490	63	5,653	44	64,681
2010	5,164	51,008	180	2,701	335	7,048	1	2,272	57	5,680	27	63,129
2011	5,235	54,225	100	2,398	344	7,795	1	2,467	59	5,680	-	66,985
2012	5,302	48,836	102	3,908	349	7,270	1	2,094	57	5,754	74	62,108
2013	5,371	49,203	102	3,300	357	7,471	1	2,086	77	5,831	77	62,060
2014 Budget	5,404	49,729	104	3,089	357	7,514	1	1,966	33	5,866	35	62,298
<b>AVG. YRLY. GROWTH</b>												
10 YEAR PERIOD	65	287	65	74	13	371	00	68	74	6,549	72	725
5 YEAR PERIOD	44	642	140	112	13	288	-	95	57	6,156	43	647
2 YEAR PERIOD	51	447	1	410	4	122	-	64	55	5,978	56	95
<b>COMPOUNDED RATE</b>												
<b>PERCENT INCREASE</b>												
10 YEAR PERIOD		0.61%		3.16%		9.75%		40.7%				1.32%
5 YEAR PERIOD		-1.56%		4.44%		4.73%		6.39%				-0.541%
FORECAST 2019	5,623	45,521	109	3,000	423	8,952	1	2,442	44	6,156	38	59,915
FORECAST 2024	5,946	46,938	114	2,700	488	10,807	1	2,405	65	6,549	68	62,869
FORECAST 2029	6,288	49,650	119	3,275	516	11,427	1	2,425	68	6,924	71	66,777
<b>AVERAGE</b>												
<b>YEARLY</b>												
<b>INCREASE</b>												
5 YEAR PERIOD	44	642	1	118	13	288	-	95	2	58	5	477
10 YEAR PERIOD	54	277	1	69	13	329	-	44	3	68	3	57
15 YEAR PERIOD	59	65	1	12	11	261	-	31	2	71	2	299

Form 736

<b>LOAD FORECAST</b>		<b>ENTIRE SYSTEM LOAD ESTIMATES</b>		
<b>TYPE OF CONSUMER</b>	<b>YEAR</b>	<b>NUMBER OF METERS (FORM736)</b>	<b>ANNUAL MWH REQUIREMENTS</b>	
RESIDENTIAL	2014	5,404	49,729	
	2019	5,623	45,521	
	2024	5,946	46,958	
	2029	6,288	49,650	
IRRIGATION	2014	104	3,089	
	2019	109	3,000	
	2024	114	2,700	
	2029	119	3,275	
SMALL COMMERCIAL	2014	357	7,514	
	2019	423	8,952	
	2024	488	10,807	
	2029	516	11,427	
LARGE COMMERCIAL	2014	1	1,966	
	2019	1	2,442	
	2024	1	2,405	
	2029	1	2,425	
SUBTOTAL	2014	5,866	62,298	
	2019	6,156	59,915	
	2024	6,549	62,869	
	2029	6,923	66,777	
PLUS SYSTEM LOSSES	2014	14.26%	8,885	
	2019	14.00%	8,388	
	2024	14.00%	8,802	
	2029	14.00%	9,349	
TOTAL	2014		71,183	
	2019		68,303	
	2024		71,671	
	2029		76,126	
NON-COINCIDENT PEAK DEMAND	2014		15,826	
	2019		16,244	
	2024		17,045	
	2029		18,104	
ANNUAL LOAD FACTOR	2014		51.35%	
	2019		48.00%	
	2024		48.00%	
	2029		48.00%	

**LOAD FORECAST**  
**SUMMARY OF CONSUMERS AND MWH ESTIMATES**



CLASS OF CONSUMER	NUMBERS OF METERS			MWH ESTIMATES		
	2019	2024	2029	2019	2024	2029
RESIDENTIAL	5,623	5,946	6,288	45,521	46,958	49,650
IRRIGATION	109	114	119	3,000	2,700	3,275
SMALL COMMERCIAL	423	488	516	8,952	10,807	11,427
LARGE COMMERCIAL	1	1	1	2,442	2,405	2,425

**TOTAL POWER REQUIREMENTS**

ITEM	2014	2019	2024	2029
ANNUAL MWH REQUIREMENTS	71,183	68,303	71,671	76,126
INCLUDING LOSSES @	14.25%	14.00%	14.00%	14.00%
ANNUAL LOAD FACTOR	51.35%	48.00%	48.00%	48.00%
NON-COINCIDENT PEAK DEM.	15826	16244	17045	18,104
SOURCES OF SUPPLY	Southern			

FORM 341

<b>LOAD FORECAST</b>					
<b>ESTIMATE OF SYSTEM LOSSES</b>					
YEAR	MWH SALES	MILES OF LINE	MWH SALES PER MILE OF LINE	% SYSTEM LOSS ACTUAL	
2002	54,962	1,575	35	10.73%	
2003	56,071	1,596	35	9.56%	
2004	55,048	1,607	34	8.89%	
2005	57,810	1,641	35	8.34%	
2006	59,615	1,671	36	10.23%	
2007	62,020	1,686	37	12.39%	
2008	64,227	1,704	38	11.84%	
2009	64,031	1,726	37	9.89%	
2010	63,129	1,732	36	9.11%	
2011	66,985	1,740	38	5.98%	
2012	62,108	1,749	36	10.10%	
2013	62,060	1,760	35	13.33%	
2014 Budgeted	62,298	1,770	35	14.26%	
<b>TOTAL</b>				105.47%	
<b>AVERAGE</b>				9.59%	
<b>ESTIMATE (FORM 5): (METER DENSITY)</b>					
			Meters/Mi	Percentage Growth/Yr	
		2019	3.37	0.35%	
		2024	3.43	0.35%	
		2029	3.49	0.36%	
	PROJECTED MWH SALES	PROJECTED	PROJECTED MWH	PROJECTED SYSTEM	
YEAR	(FORM 4)	MILES OF LINE	SALES/MI.	LOSS	
2019	59,915	1,820	33	14.00%	
2024	62,869	1,871	34	14.00%	
2029	66,777	1,983	34	14.00%	

Form 344