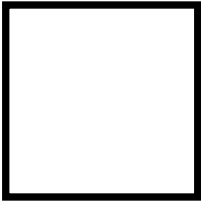
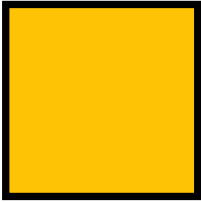



APPENDIX G

Minnkota Power Cooperative's 2013 Load Forecast Study



Your Touchstone Energy® Partner 

2013 Electric Load Forecast Study

December 2013

Prepared by:



Clearspring Energy Advisors LLC

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2013 Electric Load Forecast

Minnkota Power Cooperative, Inc.

Grand Forks, North Dakota

Prepared By:

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2013 Electric Load Forecast Study

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EXECUTIVE SUMMARY

Minnkota Power Cooperative, Inc. **2013 Electric Load Forecast**

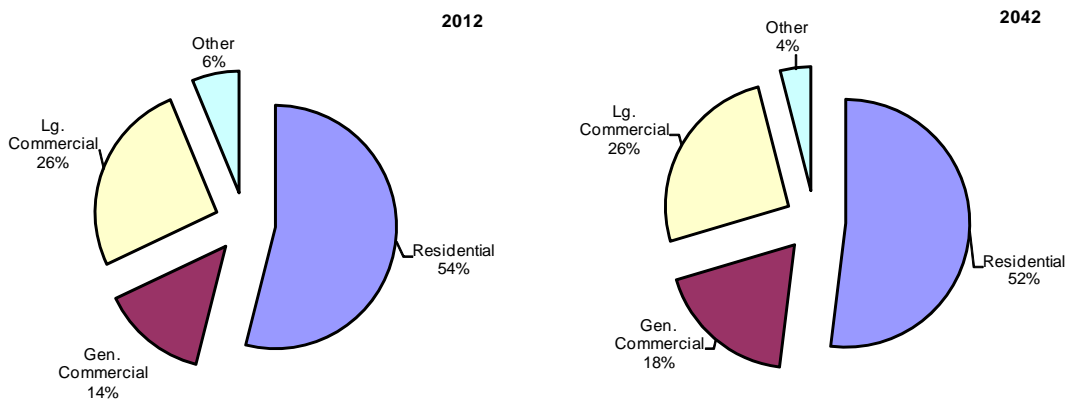
Executive Summary

Overview

The 2013 Electric Load Forecast Study (Load Forecast) is a thirty year (2014 through 2042) forecast of energy requirements and peak demands for Minnkota Power Cooperative, Inc (Minnkota). Minnkota is an electric generation and transmission cooperative headquartered in Grand Forks, North Dakota. Minnkota provides electric power and services to eleven member distribution cooperatives (member systems) located in northwestern Minnesota and eastern North Dakota. Minnkota also has a joint operating agreement with the Northern Municipal Power Agency (NMPA). Together Minnkota and NMPA are referred to the Joint System in this report. Most of the member systems' loads are residential, but commercial loads also offer significant growth potential.

The Load Forecast is developed as part of Minnkota's Load Forecast process that regularly updates reports for Minnkota and 11 associated member systems (previously referred to as Power Requirements Studies). The Minnkota Load Forecast will be derived as the sum of projections for individual member systems, establishing a critical link between all forecasts produced. The last Load Forecast report for Minnkota was developed in 2011.

Member System Forecast Summary
Minnkota Power Cooperative, Inc.

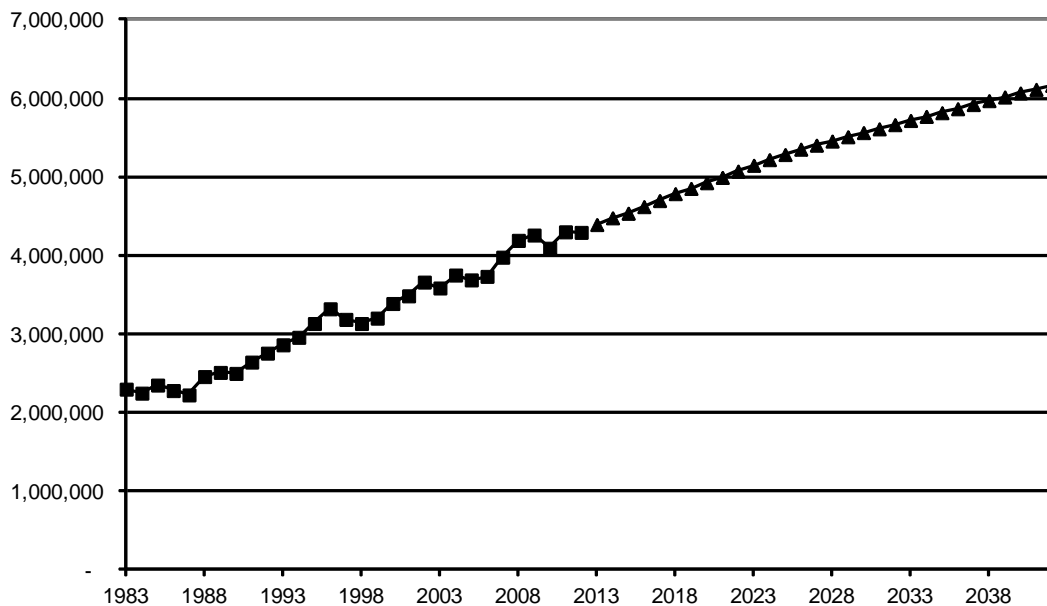


The forecasting process relies heavily on internal system data, third-party demographic and economic data, and insight from cooperative staff that are most familiar with the customers and trends in their service territory. An emphasis has been placed on strong coordination between Minnkota, the member cooperatives, NMPA, and the consultant involved in preparing this study to ensure accurate and useful load forecast results. This coordination includes formal data requests and a review session to discuss the preliminary forecast results and to recommend any changes needed.

Forecasts

The key growth factors that will shape the growth in Minnkota's customer base include local population, household and employment expansion. Total energy requirements are the sum of the individual member systems' requirements plus own-use, losses, and sales to NMPA. Energy requirements for Minnkota member systems are expected to grow at 1.2 percent per year over the 2013-2042 forecast period and total Joint System energy requirements are expected to increase at 1.2 percent per year during that same period (2013-2042). The following tables present the member system projections by consumer class and the summary of Joint System total energy requirements.

Joint System Energy Requirements
MWh



Joint System Energy Requirements
MWh

| <u>Year</u> | <u>Total Member Energy Requirements</u> | <u>Minnkota Losses</u> | <u>CAFS</u> | <u>Minnkota Total Requirements</u> | <u>NMPA Energy Requirements</u> | <u>Joint System Energy Requirements</u> |
|-------------|---|------------------------|-------------|------------------------------------|---------------------------------|---|
| 1983 | 1,693,428 | 315,108 | 12,702 | 2,021,238 | 276,747 | 2,297,985 |
| 1984 | 1,732,374 | 209,371 | 13,278 | 1,955,023 | 291,481 | 2,246,504 |
| 1985 | 1,795,833 | 224,797 | 12,079 | 2,032,709 | 316,341 | 2,349,050 |
| 1986 | 1,750,845 | 190,234 | 11,867 | 1,952,946 | 325,970 | 2,278,916 |
| 1987 | 1,673,781 | 205,761 | 14,233 | 1,893,775 | 329,707 | 2,223,482 |
| 1988 | 1,838,947 | 246,728 | 14,641 | 2,100,316 | 357,429 | 2,457,745 |
| 1989 | 1,920,073 | 203,001 | 15,669 | 2,138,743 | 372,491 | 2,511,234 |
| 1990 | 1,860,324 | 257,656 | 16,063 | 2,134,043 | 363,032 | 2,497,075 |
| 1991 | 2,018,791 | 216,791 | 21,494 | 2,257,076 | 382,175 | 2,639,251 |
| 1992 | 2,017,999 | 315,258 | 47,384 | 2,380,641 | 372,754 | 2,753,395 |
| 1993 | 2,160,868 | 257,865 | 48,628 | 2,467,361 | 391,546 | 2,858,907 |
| 1994 | 2,228,292 | 268,455 | 50,341 | 2,547,088 | 407,465 | 2,954,553 |
| 1995 | 2,352,345 | 300,501 | 48,367 | 2,701,213 | 428,635 | 3,129,848 |
| 1996 | 2,488,710 | 335,722 | 47,402 | 2,871,834 | 446,082 | 3,317,916 |
| 1997 | 2,456,133 | 253,987 | 40,285 | 2,750,405 | 432,825 | 3,183,230 |
| 1998 | 2,347,968 | 322,015 | 31,101 | 2,701,084 | 427,437 | 3,128,521 |
| 1999 | 2,473,174 | 247,734 | 34,466 | 2,755,374 | 442,374 | 3,197,748 |
| 2000 | 2,553,456 | 348,169 | 36,080 | 2,937,705 | 445,121 | 3,382,826 |
| 2001 | 2,692,024 | 287,930 | 40,286 | 3,020,240 | 459,957 | 3,480,197 |
| 2002 | 2,865,734 | 274,732 | 41,806 | 3,182,272 | 472,905 | 3,655,177 |
| 2003 | 2,860,849 | 206,161 | 39,307 | 3,106,317 | 473,809 | 3,580,126 |
| 2004 | 2,930,437 | 301,596 | 38,706 | 3,270,740 | 473,797 | 3,744,537 |
| 2005 | 2,997,936 | 169,501 /1 | 35,335 /2 | 3,202,773 | 479,640 | 3,682,413 |
| 2006 | 3,080,882 | 162,899 | - | 3,243,781 | 485,217 | 3,728,998 |
| 2007 | 3,269,300 | 210,402 | - | 3,479,702 | 493,233 | 3,972,935 |
| 2008 | 3,460,221 | 239,589 | - | 3,699,810 | 486,562 | 4,186,372 |
| 2009 | 3,518,961 | 260,094 | - | 3,779,055 | 474,666 | 4,253,722 |
| 2010 | 3,425,669 | 199,285 | - | 3,624,954 | 461,427 | 4,086,381 |
| 2011 | 3,602,110 | 232,827 | - | 3,834,937 | 459,785 | 4,294,722 |
| 2012 | 3,556,036 | 281,871 | - | 3,837,907 | 450,875 | 4,288,782 |
| 2013 | 3,710,442 | 215,952 | - | 3,926,393 | 460,374 | 4,386,767 |
| 2014 | 3,787,366 | 220,429 | - | 4,007,794 | 464,611 | 4,472,405 |
| 2015 | 3,840,122 | 223,499 | - | 4,063,622 | 467,871 | 4,531,493 |
| 2016 | 3,915,718 | 227,899 | - | 4,143,617 | 471,129 | 4,614,746 |
| 2017 | 3,986,103 | 231,995 | - | 4,218,099 | 474,323 | 4,692,422 |
| 2018 | 4,065,969 | 236,644 | - | 4,302,613 | 477,420 | 4,780,033 |
| 2019 | 4,126,345 | 240,158 | - | 4,366,503 | 480,438 | 4,846,941 |
| 2020 | 4,191,988 | 243,978 | - | 4,435,966 | 483,424 | 4,919,390 |
| 2021 | 4,252,980 | 247,528 | - | 4,500,508 | 486,422 | 4,986,930 |
| 2022 | 4,325,392 | 251,742 | - | 4,577,134 | 489,321 | 5,066,455 |
| 2023 | 4,393,453 | 255,704 | - | 4,649,157 | 492,156 | 5,141,313 |
| 2024 | 4,458,147 | 259,469 | - | 4,717,616 | 494,970 | 5,212,585 |
| 2025 | 4,516,664 | 262,875 | - | 4,779,539 | 497,785 | 5,277,324 |
| 2026 | 4,578,999 | 266,503 | - | 4,845,501 | 500,604 | 5,346,105 |
| 2027 | 4,623,996 | 269,121 | - | 4,893,118 | 503,438 | 5,396,556 |
| 2028 | 4,671,285 | 271,874 | - | 4,943,159 | 506,272 | 5,449,431 |
| 2029 | 4,719,799 | 274,697 | - | 4,994,496 | 509,144 | 5,503,641 |
| 2030 | 4,767,469 | 277,472 | - | 5,044,941 | 512,026 | 5,556,967 |
| 2031 | 4,809,214 | 279,901 | - | 5,089,115 | 514,921 | 5,604,037 |
| 2032 | 4,856,735 | 282,667 | - | 5,139,402 | 517,860 | 5,657,261 |
| 2033 | 4,904,800 | 285,465 | - | 5,190,265 | 520,828 | 5,711,092 |
| 2034 | 4,950,946 | 288,150 | - | 5,239,096 | 523,838 | 5,762,934 |
| 2035 | 4,991,854 | 290,531 | - | 5,282,385 | 526,896 | 5,809,281 |
| 2036 | 5,037,346 | 293,179 | - | 5,330,525 | 530,017 | 5,860,542 |
| 2037 | 5,084,014 | 295,895 | - | 5,379,909 | 533,224 | 5,913,133 |
| 2038 | 5,128,436 | 298,480 | - | 5,426,916 | 536,512 | 5,963,428 |
| 2039 | 5,169,525 | 300,872 | - | 5,470,397 | 539,899 | 6,010,297 |
| 2040 | 5,213,950 | 303,457 | - | 5,517,408 | 543,386 | 6,060,794 |
| 2041 | 5,254,209 | 305,801 | - | 5,560,009 | 546,927 | 6,106,936 |
| 2042 | 5,298,268 | 308,365 | - | 5,606,633 | 550,518 | 6,157,151 |

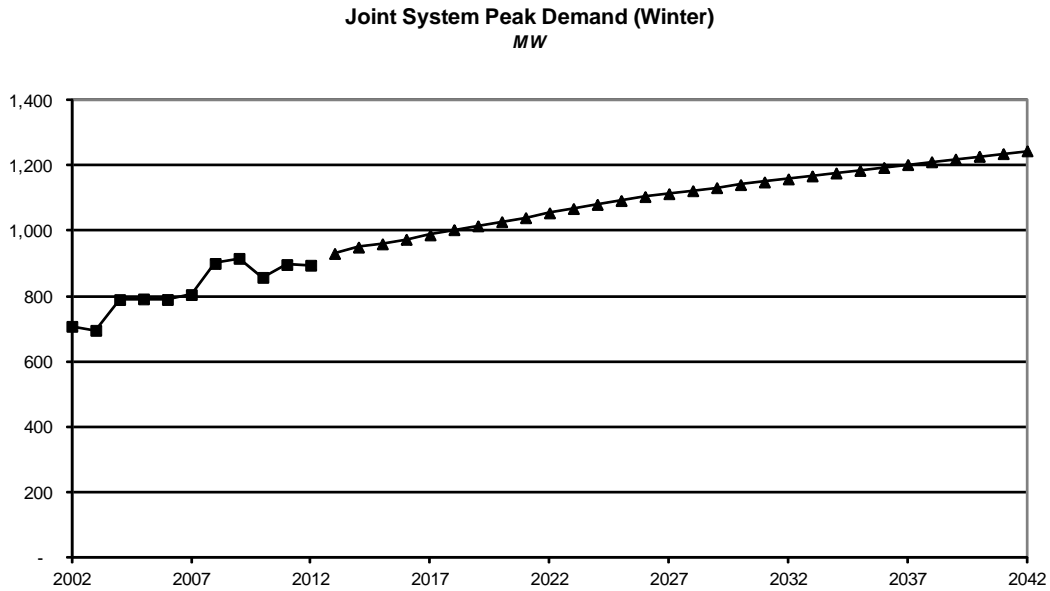
Average Annual Growth Rates

| | | | | | | |
|-----------|------|-------|---------|------|-------|------|
| 1983-2012 | 2.6% | -0.4% | -100.0% | 2.2% | 1.7% | 2.2% |
| 1997-2012 | 2.5% | 0.7% | -100.0% | 2.2% | 0.3% | 2.0% |
| 2002-2012 | 2.2% | 0.3% | -100.0% | 1.9% | -0.5% | 1.6% |
| 2007-2012 | 1.7% | 6.0% | -- | 2.0% | -1.8% | 1.5% |
| 2012-2017 | 2.3% | -3.8% | -- | 1.9% | 1.0% | 1.8% |
| 2012-2022 | 2.0% | -1.1% | -- | 1.8% | 0.8% | 1.7% |
| 2012-2032 | 1.6% | 0.0% | -- | 1.5% | 0.7% | 1.4% |
| 2012-2042 | 1.3% | 0.3% | -- | 1.3% | 0.7% | 1.2% |
| 2013-2042 | 1.2% | 1.2% | -- | 1.2% | 0.6% | 1.2% |

/1 Losses reduced due to calculation adjustment - future loss % set at 5.5%

/2 Transferred to Nodak starting in 2006

The annual winter peak demands have been projected for the Joint System using the forecast developed from the individual member systems' and NMPA forecasts. The annual winter peak is expected to grow at an annual rate of 1.0 percent over the forecast horizon. The base forecast for the Joint System winter peak demand is summarized below.



Uncertainty Analysis

This study includes analyses of forecast uncertainty based on extreme economic and weather conditions. Planning studies should reflect the base projection but should also consider the range of extreme economic and weather scenarios. Planning ranges have been developed using Monte Carlo simulation (shown in Section 4.4) that reflects the most probable ranges drawn from the economic and weather ranges. For 2042, the planning range outlook varies from the base forecast of total Joint System energy requirements by approximately +15 to -10 percent.

Joint System Peak Demand
MW

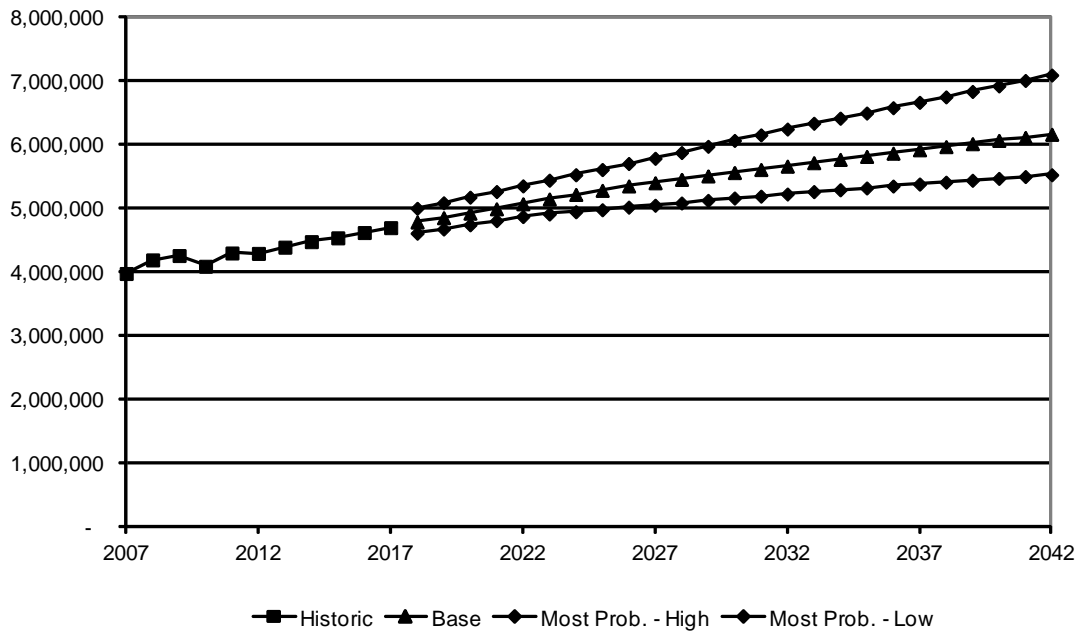
| <u>Year</u> | <u>Winter Peak Demand</u> | <u>Summer Peak Demand</u> | <u>Annual Peak Demand</u> | <u>Load Factor %</u> |
|-------------|---------------------------|---------------------------|---------------------------|----------------------|
| 1997 | 663 | 369 | 663 | 55% |
| 1998 | 680 | 400 | 680 | 53% |
| 1999 | 709 | 414 | 709 | 51% |
| 2000 | 691 | 413 | 691 | 56% |
| 2001 | 696 | 437 | 696 | 57% |
| 2002 | 711 | 461 | 711 | 59% |
| 2003 | 699 | 514 | 699 | 58% |
| 2004 | 792 | 447 | 792 | 54% |
| 2005 | 788 | 482 | 788 | 53% |
| 2006 | 786 | 505 | 786 | 54% |
| 2007 | 806 | 521 | 806 | 56% |
| 2008 | 906 | 512 | 906 | 53% |
| 2009 | 917 | 506 | 917 | 53% |
| 2010 | 851 | 574 | 851 | 55% |
| 2011 | 897 | 574 | 897 | 55% |
| 2012 | 895 | 597 | 895 | 55% |
| 2013 | 931 | 571 | 931 | 54% |
| 2014 | 950 | 582 | 950 | 54% |
| 2015 | 960 | 589 | 960 | 54% |
| 2016 | 974 | 599 | 974 | 54% |
| 2017 | 988 | 608 | 988 | 54% |
| 2018 | 1,004 | 619 | 1,004 | 54% |
| 2019 | 1,015 | 627 | 1,015 | 54% |
| 2020 | 1,028 | 636 | 1,028 | 55% |
| 2021 | 1,040 | 644 | 1,040 | 55% |
| 2022 | 1,055 | 653 | 1,055 | 55% |
| 2023 | 1,068 | 662 | 1,068 | 55% |
| 2024 | 1,081 | 671 | 1,081 | 55% |
| 2025 | 1,093 | 678 | 1,093 | 55% |
| 2026 | 1,105 | 687 | 1,105 | 55% |
| 2027 | 1,114 | 693 | 1,114 | 55% |
| 2028 | 1,123 | 699 | 1,123 | 55% |
| 2029 | 1,132 | 706 | 1,132 | 56% |
| 2030 | 1,141 | 712 | 1,141 | 56% |
| 2031 | 1,149 | 718 | 1,149 | 56% |
| 2032 | 1,159 | 724 | 1,159 | 56% |
| 2033 | 1,168 | 730 | 1,168 | 56% |
| 2034 | 1,177 | 737 | 1,177 | 56% |
| 2035 | 1,185 | 742 | 1,185 | 56% |
| 2036 | 1,194 | 748 | 1,194 | 56% |
| 2037 | 1,203 | 754 | 1,203 | 56% |
| 2038 | 1,211 | 760 | 1,211 | 56% |
| 2039 | 1,219 | 766 | 1,219 | 56% |
| 2040 | 1,228 | 772 | 1,228 | 56% |
| 2041 | 1,236 | 777 | 1,236 | 56% |
| 2042 | 1,245 | 783 | 1,245 | 56% |

Average Annual Growth Rates

| | | | |
|-----------|------|------|------|
| 1997-2012 | 2.0% | 3.3% | 2.0% |
| 2002-2012 | 2.3% | 2.6% | 2.3% |
| 2007-2012 | 2.1% | 2.8% | 2.1% |
| 2012-2017 | 2.0% | 0.4% | 2.0% |
| 2012-2022 | 1.7% | 0.9% | 1.7% |
| 2012-2032 | 1.3% | 1.0% | 1.3% |
| 2012-2042 | 1.1% | 0.9% | 1.1% |
| 2013-2042 | 1.0% | 1.1% | 1.0% |

Based on MAPP Form 3 Peak with WAPA allocations

Joint System Forecast - Most Probable Ranges MWh



SECTION 1

LOAD FORECAST STUDY PROCESS

Section 1

Load Forecast Study Process

1.1 Forecast Study Purpose

The Minnkota Power Cooperative Inc. (Minnkota) load forecast is produced as part of an ongoing resource planning program. The RUS Electric Load Forecast Study (Load Forecast) is a thirty year (2013-2042) forecast of energy requirements and seasonal peak demands based on historical data through 2012. The last Load Forecast report for Minnkota was published in 2011. This report includes the data used to develop new projections; discussions of the analytic procedures used; and presentations of the range of projections derived for the Minnkota system. The load forecast provides Minnkota with a tool to aid in planning for future electric demand and energy requirements. The primary purposes of this Load Forecast are to:

1. Identify factors that significantly influenced Minnkota's system loads in the past.
2. Develop valid estimates for future electric loads by class and total system over a thirty-year projection period.
3. Assess the range of future loads that could reasonably materialize.

1.2 Forecast Uses

This Load Forecast is designed to meet a wide range of needs for Minnkota. The range of projections developed in this study is intended for the following uses:

- System Expansion and Replacement Planning
- Financial Forecasting
- Rate Design and Development
- Marketing
- Demand-Side Management Planning
- General Utility Planning

1.3 Forecast Study Scope

This Load Forecast has been prepared in compliance with United States Department of Agriculture - Rural Utilities Service (RUS) guidelines as specified in 7 CFR, Part 1710, *"General and Pre-loan Policies and Procedures Common to Insured and Guaranteed*

Electric Loans" as published in the Federal register. The specific requirements are contained in Section 1710.203, "*Requirements to Prepare a Load Forecast*". The basic requirements that must be addressed in either the RUS approved Work Plan or forecast report are:

- A discussion of the scope of the forecast.
- A discussion of the borrower personnel, consultants, data and other resources used in the preparation of the forecast.
- A discussion of the procedures used to collect, validate, process and update the data used in the study.
- Documentation of the analysis and modeling of the borrower's electric system loads and other pertinent information used in the forecast.
- An analysis of the borrower's past, present, and future electric system loads of the borrower's RE Act beneficiaries and others.
- A discussion and analysis of the following alternate growth scenarios:
 - Most-probable economic assumptions with normal weather.
 - Most-probable economic assumptions with severe weather.
 - Most-probable economic assumptions with mild weather.
 - Normal weather with pessimistic macroeconomic assumptions.
 - Normal weather with optimistic macroeconomic assumptions.
- Ten years of system data from RUS Form 7 or equivalent. These can be found in the respective member reports.
- A discussion and documentation of the coordination activities between the power supply borrower and its RUS borrower members and the borrower and RUS.
- The borrower's general manager's recommendation to the board of directors on adoption of the forecast and;
- Approval of the forecast by the borrower's board of directors.

1.4 Forecast Study Coordination

Minnkota views load forecasting as an ongoing effort that relies heavily on effective communication and coordination between member system management and staff,

Minnkota management and staff, NMPA staff, and the consultant, Clearspring Energy Advisors, LLC. The focal points of the coordination effort include the following:

1. Clearspring Energy prepared an initial data request for Minnkota member systems to complete. As part of that data request, member systems provided historic RUS Form 7 data on customers, energy and peak demand monthly through 2012.
2. Clearspring Energy obtained third party and system data and combined them in the forecast databases. The third party data includes weather data from the Midwestern Regional Climate Center, energy price data from the Energy Information Administration and economic and demographic data from Woods and Poole Economics.
3. Member systems provided Clearspring Energy with a copy of their most recent financial forecast or price projection. A price forecast based on this financial forecast was then used as an input to development of class sales projections.
4. Clearspring Energy developed the projection models for consumers and use per consumer for each of the customer classes. These preliminary projections were then provided to the member systems and Minnkota for review and comment. A description of these models and methods are presented in Appendix B.
5. The member system Managers and staff and NMPA staff reviewed the results and provided feedback to Clearspring Energy. Phone calls to managers were made to discuss revisions to the forecasts. A copy of the manager responses to the review is provided in the respective reports.
6. Based on inputs from discussions with member system staff, Clearspring Energy modified the preliminary projections as appropriate and prepared the final reports documenting methods, assumptions and results.

1.5 Forecast Study Methodology

One of the primary assumptions of forecasting is that the past is generally the best predictor of the future. There are three key statistical methods of using the past to predict the future: univariate, multivariate, and qualitative. All methods were considered in order to determine which was most appropriate for this forecast. Greater weight was given to multivariate forecasting, or regression analysis, which is one of the most widely used methods of modeling time series data. It is the primary technique used to develop the forecasts for this forecast. Multivariate regression, or econometric modeling, uses the strong relationship between an independent variable (i.e. the number of households

in the service area) to explain the change in the dependent variable (i.e. the number of residential customers). This type of forecasting is accurate in the intermediate-to-long run, although its accuracy depends to a certain extent on the dependent variable being considered and the accuracy of the forecasts of the independent variables.

In the cases where development of a model was not practical, trending or judgment was used. Trend forecasts rely on analyzing past values or growth trends of a variable to extrapolate them forward in time. Qualitative or judgmental methods were used to where quantitative conclusions could not be formed logically or when expected changes in the future values deviated from past experience.

Econometric modeling, as used in this forecast, involves three major steps en route to the development of a model: 1) data collection, 2) equation specification, and 3) equation estimation and validation. These steps are discussed below.

1.5.1 Data Collection

One of the most crucial steps in the development of an econometric forecast is data collection. The availability of data is a major consideration in the selection of variables for use in developing forecasting models. The data used in this study is described in Section 2, "System Background." Economic and demographic forecasts were obtained from reputable third party providers using official U.S. Census Bureau and Department of Commerce data. This service facilitates the database process and makes available annual county level projections of important local economic and demographic variables.

1.5.2 Equation Specification

Equation specification involves the selection of the appropriate dependent variable, as shown in the long-term forecast section; identification of explanatory (independent) variables which are likely to influence the dependent variable, such as those listed in Table 2.2, and selection of an appropriate mathematical form for the equations. The equations are shown at the top of all tables for which models were developed.

The general form of the multiple regression model is a linear model given by:

$$\text{Linear: } Y = a + b_0X_0 + b_1X_1 + \dots b_nX_n + e$$

Where Y is the dependent variable and X are the independent or explanatory variables. See Appendix B for a complete description of the terms referred to in linear models. This model can be interpreted to mean that a numerical change in the explanatory variable results in a relative numerical change in the dependent variable. The coefficient of the explanatory variable indicates the size of the relative change. The sign of the coefficient is an indication of the type of relationship, positive or negative.

A second form of a regression model, also used in this forecast, is a model in the logarithmic linear form, shown here:

$$\text{Logarithmic: } \ln(Y) = a + b_0 \ln(X_0) + b_1 \ln(X_1) + \dots + b_n \ln(X_n) + e$$

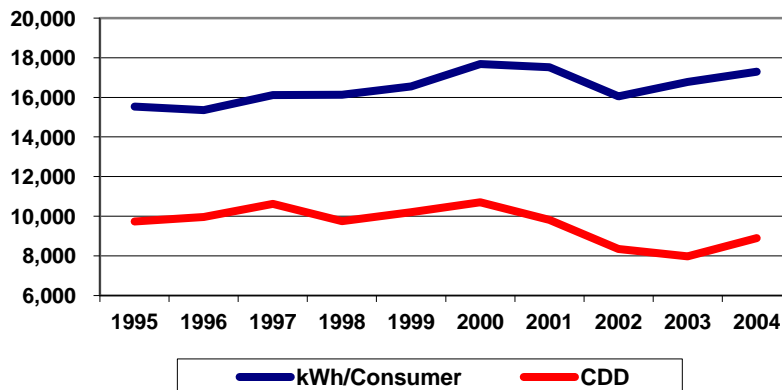
The logarithmic form can be interpreted to mean that a percentage change in an explanatory variable results in a corresponding percentage change in the dependent variable. Thus, if b_0 is 0.5, a 1.0 percent change in X_0 will result in a change of approximately 0.5 percent in Y. For example, if income increases (the independent variable), the amount of electricity purchased (the dependent variable) will also increase but not necessarily by the same amount.

1.5.3 Equation Estimation and Validation

The final step in modeling is equation estimation and validation. The regression model quantifies the relationship between the selected variables. An example of the type of a typical relationship desirable when developing an econometric model is shown in Figure 1.1.

Figure 1.1

Sample Econometric Relationship



This graph illustrates a representative historical relationship between energy sales per consumer and cooling degree-days. The econometric model specified that includes this variable would show the direct relationship between how hot or mild the climate is, and the corresponding need for cooling equipment to be used more or less during the cooling season.

Several econometric equations involving different combinations of explanatory variables and mathematical forms were tested for each consumer class. The coefficients of each equation were estimated using a multiple regression computer program that employs the method of ordinary least squares. Each of the resulting equations was subjected to a series of statistical tests from which a preferred equation was selected. In addition, the plausibility of the forecast relative to historical and expected experience was also evaluated. The major statistical tests applied to each equation are described in Appendix B.

1.6 Forecast Study Resources

1.6.1 Staffing Resources

Preparation of the Minnkota Load Forecast is an integrated effort with significant input from member systems' management and staff, Minnkota management and staff, NMPA staff, and the consultant. Overall responsibility for the load forecast program at Minnkota is assigned to the Vice President – Member Services. The Rates, Load and Planning Manager provided direct study coordination. In most cases, the member system manager has directly coordinated the data contributions to the load forecast or assigned a coordinator. Direct inputs from the member systems include:

1. Results from their most recent financial forecast or retail price projection
2. Information regarding the availability of alternate fuels in the service area
3. Information regarding penetration of major appliances
4. Information regarding key elements that shape growth in their service territory
5. Historic data from RUS Form 7 and on-peak and off-peak sales and revenue
6. Individual large load sales and revenue data and surveys
7. Reactions to the preliminary forecasts provided by Clearspring Energy
8. Responses to specific Clearspring Energy data requests.

Minnkota provided the following:

1. 2011 and 2012 Form 12 data.
2. Minnkota monthly peak demand data through 2012.
3. Historical and projected Minnkota wholesale power costs.
4. Responses to specific data requests.

The primary analytic and reporting responsibilities for this forecast have been assigned to Clearspring Energy Advisors, LLC (Clearspring Energy). Clearspring Energy staff with the heaviest involvement in the Minnkota forecast includes the Project Manager, Senior Analyst and Project Assistant.

1.6.2 Data Resources

The following external data sources were used for preparation of this forecast.

1. Woods and Poole Economics, Inc. Complete Economic and Demographic Data Series (CEDDS), Fall 2010.
2. Midwestern Regional Climate Center online database for select Minnesota and North Dakota weather stations.
3. U.S. Department of Energy. Annual Energy Outlook, 2013.
4. U.S. Department of Energy. "Monthly Energy Review", various issues.
5. Minnkota Residential Surveys, 1988, 1990, 1993, 1996, 1999, 2005 and 2010.

1.6.3 Technical / Computing Resources

The database development and analyses for this forecast have been generated on PC compatible computers with a minimum of 2 gigabytes of RAM and 100 gigabytes of hard-disk capacity. Commercial software packages used in preparation of this study include Excel 2007; EViews, Version 6.0; and Word 2007. Excel is used extensively for spreadsheet analysis, graphics and as a pre-processor for regression analyses. Data is commonly entered into Excel spreadsheets where necessary calculations and transformations are performed prior to transfer to EViews. Excel is also used for generation of the majority of the forecast report graphics and as a template for the required RUS forms. EViews software is used for regression analyses and development

of the forecasts based on the selected regression equations. Word has been used as the word processor for the complete forecast report.

SECTION 2
SYSTEM BACKGROUND

Section 2 System Background

2.1 Service Territory

The following sections detail the geographic location and characteristics of Minnkota and the member systems' service territories. Each member system is a 95 percent requirements energy purchaser of Minnkota. Each member has the option of purchasing up to 5 percent of energy resources from another supplier.

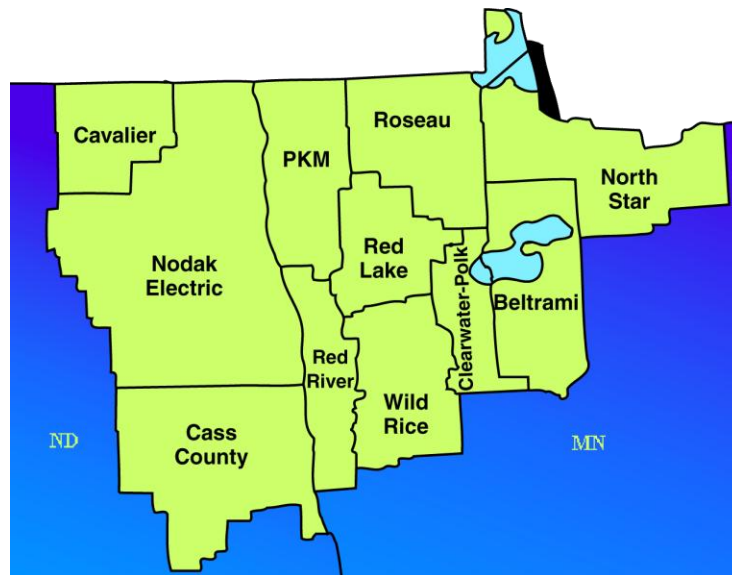
2.1.1 Location

Minnkota is headquartered in Grand Forks, North Dakota and provides power to eleven member systems located in eastern North Dakota and northwest Minnesota. Minnkota also serves one direct customer, the Northern Municipal Power Agency (NMPA), with which Minnkota has a joint operating agreement. Together Minnkota and NMPA are referred to as the Joint System in this report.

Minnkota serves the member systems through more than 2,900 miles of transmission lines covering approximately 34,500 square miles. Each member system's location is shown in Figure 2.1.

Figure 2.1

Minnkota Member Systems Service Territory



The individual cooperative members of Minnkota are:

| <u>Cooperative</u> | <u>RUS Designation</u> |
|--|--------------------------------|
| Minnkota Power Cooperative, Inc. Grand Forks, ND | North Dakota-20-Minnkota |
| Beltrami Electric Cooperative, Inc. Bemidji, MN | Minnesota-96-Beltrami |
| Cass County Electric Cooperative, Inc. Fargo, ND | North Dakota-11-Cass |
| Cavalier Rural Electric Cooperative, Inc. Langdon, ND | North Dakota-38-Cavalier |
| Clearwater-Polk Electric Cooperative, Inc. Bagley, MN | Minnesota-101-Clearwater |
| Nodak Electric Cooperative, Inc. Grand Forks, ND | North Dakota-19-Grand Forks |
| North Star Electric Cooperative, Inc. Baudette, MN | Minnesota-95-Lake of the Woods |
| PKM Electric Cooperative, Inc. Warren, MN | Minnesota-87-Marshall |
| Red Lake Electric Cooperative, Inc. Red Lake Falls, MN | Minnesota-75-Red Lake |
| Red River Valley Electric Cooperative, Inc. Halstad, MN | Minnesota-74-Norman |
| Roseau Electric Cooperative, Inc. Roseau, MN | Minnesota-97-Roseau |
| Wild Rice Electric Cooperative, Inc. Mahnomen, MN | Minnesota-82-Becker |

2.1.2 Geography

The portions of North Dakota and Minnesota that Minnkota's member systems serve are considered prairie. Small areas of dense forest and numerous lakes break up the prairie. These lakes create a tourist industry, which is characterized by seasonal hunting, camping and water sports activities. Area lakes are also notable for world-class fishing.

Farming is very important to the area economy, especially the fertile Red River Valley. Typical crops include: wheat, sugar beets, potatoes and beans. Many of Minnkota's member system's large commercial class consumers are food processors for either local agricultural cooperatives or multinational agricultural product companies.

2.1.3 Climate

Weather affects total energy requirements and peak demands due to electric use primarily for space heating and occasional space cooling. Energy use of other appliances such as water heaters, dehumidifiers, refrigerators and freezers also varies with weather. Data from various Minnesota and North Dakota weather stations were used in the forecast. Weather data is presented in Table 2.1.

2.1.4 Power Supply and Delivery

The vast majority of the power Minnkota generates is sold to members with a small portion allocated to its non-member, NMPA. Most of Minnkota's energy comes from its lignite-fired generating plants. The plants are located next to coal fields thus eliminating the need to transport coal by train. Electrical power is delivered primarily through a 69 kV transmission system to the member cooperatives through substations serviced by Minnkota.

Minnkota also regularly evaluates alternatives to traditional fossil-fuel power production as part of its resource planning activities. Minnkota has 25-year agreements by which it purchases 139.5 MW from the Langdon Wind Project and 217.5 MW of wind energy from the Ashtabula Wind Project. These projects began operations in 2008 and 2009 respectively. This is in addition to two 1 MW wind projects Minnkota already owns and operates under its Infinity Wind subsidiary. Minnkota will continue to evaluate renewable and alternative energy options as part of its on-going resource planning process.

2.1.5 Conservation and Load Management

Minnkota has been actively involved in load management and conservation since the mid-1970's. In 1977, Minnkota installed a load management program using a 220 hertz ripple injection system to control loads. Minnkota's load management system has proven to be very acceptable and economical for consumers.

The member systems are involved in a variety of programs and promotional campaigns to promote cost-effective energy saving activities. These discussions are presented in the individual member system reports.

The Minnesota legislature enacted the Minnesota Conservation Investment Program (CIP) which requires utilities to invest a portion of revenues in energy efficiency and conservation programs. Typical programs include rebates for the purchase of energy efficient appliances, such as furnaces, water heaters, lighting, etc. The purpose of the statute is to give consumers an incentive to conserve energy through behavioral changes or purchasing energy efficient appliances. This statute will impact the eight Minnesota member systems. Minnkota has designed a set of programs to help its members systems institute a number of energy efficiency improvements to fulfill the CIP obligations. This is discussed further in Section 4.5.

2.1.6 Economic and Demographic Trends

Minnkota's service area economy has historically relied on agriculture. Much of the area is highly productive fertile farming area, part of which contains the Red River Valley basin. As traditional rural areas open up to development, employment from sectors such as retail and service become more important. Retail and service employment has grown faster than total employment in the past decade. Minnkota's service area has shown only slight growth in population in recent years. Table 2.1 presents several important economic and demographic factors that have contributed to this growth. The data presented are weighted for Minnkota's service territory.

Total population in Minnkota's service area is expected to grow 0.7 percent per year over the projection horizon as shown in Table 2.1. This is stronger growth than has been seen in the previous twenty years which grew at an average annual growth rate of around 0.3 percent. Employment growth, which has been growing at an annual rate of 1.4 percent over the past thirty years, is expected to be similar over the next thirty years. Employment is expected to grow at an average annual growth rate of 1.3 percent, which is faster growth than experienced in the past five years including the most recent economic downturn. Per capita income is expected to grow at an annual rate of 1.6 percent per year. The lingering effects of the current economic slowdown are expected to have an impact on the long-term Minnkota growth trends at least in the near term.

Table 2.1

Economic, Demographic And Weather Forecasts
Minnkota Power Cooperative, Inc.

| Year | Population | Persons Per | Total | Income Per | Retail | Propane | Heating | Cooling | Central Air | Electric |
|------|------------|-------------|------------|---------------|---------------|--------------|-------------|-------------|-------------------|-------------------|
| | | Household | Employment | Capita (05\$) | Sales (M05\$) | Price (05\$) | Degree Days | Degree Days | Condition. Sat. % | Space Heat Sat. % |
| 1983 | 208,518 | 2.82 | 102,767 | \$ 18,595 | \$ 1,932.79 | \$ 1.33 | 9,400 | 641 | 50% | 15% |
| 1984 | 208,879 | 2.79 | 104,611 | \$ 20,927 | \$ 2,092.45 | \$ 1.24 | 9,397 | 462 | 50% | 17% |
| 1985 | 208,700 | 2.76 | 106,624 | \$ 20,231 | \$ 2,036.61 | \$ 1.19 | 10,212 | 204 | 51% | 20% |
| 1986 | 207,541 | 2.73 | 106,880 | \$ 20,775 | \$ 2,020.16 | \$ 1.16 | 9,267 | 385 | 51% | 23% |
| 1987 | 207,156 | 2.71 | 110,445 | \$ 20,871 | \$ 1,923.48 | \$ 1.06 | 8,307 | 470 | 52% | 26% |
| 1988 | 207,823 | 2.68 | 112,191 | \$ 19,619 | \$ 1,999.68 | \$ 1.02 | 9,648 | 669 | 52% | 30% |
| 1989 | 207,653 | 2.67 | 113,966 | \$ 20,627 | \$ 2,039.84 | \$ 0.91 | 10,410 | 514 | 53% | 36% |
| 1990 | 207,750 | 2.66 | 116,769 | \$ 21,638 | \$ 2,050.08 | \$ 1.12 | 9,027 | 452 | 53% | 42% |
| 1991 | 208,527 | 2.65 | 119,117 | \$ 20,956 | \$ 1,999.52 | \$ 0.96 | 9,261 | 548 | 54% | 43% |
| 1992 | 210,210 | 2.63 | 121,445 | \$ 22,269 | \$ 2,059.40 | \$ 0.87 | 9,407 | 188 | 55% | 44% |
| 1993 | 211,639 | 2.62 | 123,916 | \$ 20,992 | \$ 2,171.58 | \$ 0.96 | 10,002 | 241 | 56% | 45% |
| 1994 | 213,383 | 2.62 | 128,528 | \$ 22,511 | \$ 2,327.27 | \$ 0.91 | 9,374 | 294 | 57% | 46% |
| 1995 | 215,001 | 2.61 | 132,418 | \$ 22,616 | \$ 2,412.19 | \$ 0.89 | 9,964 | 524 | 58% | 47% |
| 1996 | 216,002 | 2.58 | 135,097 | \$ 24,781 | \$ 2,519.65 | \$ 1.04 | 10,960 | 408 | 59% | 48% |
| 1997 | 216,672 | 2.56 | 137,243 | \$ 24,147 | \$ 2,593.79 | \$ 1.01 | 9,742 | 381 | 59% | 46% |
| 1998 | 215,949 | 2.55 | 139,941 | \$ 26,500 | \$ 2,649.74 | \$ 0.86 | 8,411 | 416 | 59% | 43% |
| 1999 | 216,199 | 2.53 | 141,552 | \$ 26,874 | \$ 2,800.64 | \$ 0.84 | 8,577 | 321 | 59% | 41% |
| 2000 | 216,457 | 2.51 | 143,608 | \$ 28,536 | \$ 2,879.37 | \$ 1.12 | 9,285 | 337 | 58% | 42% |
| 2001 | 216,371 | 2.45 | 144,348 | \$ 28,480 | \$ 2,864.18 | \$ 1.22 | 8,954 | 484 | 57% | 43% |
| 2002 | 216,768 | 2.45 | 144,569 | \$ 28,903 | \$ 2,859.10 | \$ 1.00 | 9,540 | 510 | 57% | 44% |
| 2003 | 218,035 | 2.43 | 145,251 | \$ 30,625 | \$ 2,921.74 | \$ 1.15 | 9,511 | 433 | 56% | 45% |
| 2004 | 220,403 | 2.43 | 147,390 | \$ 29,779 | \$ 3,043.57 | \$ 1.27 | 9,725 | 196 | 55% | 46% |
| 2005 | 221,319 | 2.42 | 149,888 | \$ 30,098 | \$ 3,125.99 | \$ 1.45 | 9,060 | 415 | 54% | 47% |
| 2006 | 222,222 | 2.42 | 151,349 | \$ 30,735 | \$ 3,186.27 | \$ 1.57 | 8,623 | 503 | 56% | 46% |
| 2007 | 222,984 | 2.40 | 153,219 | \$ 32,275 | \$ 3,192.44 | \$ 1.69 | 9,426 | 482 | 58% | 45% |
| 2008 | 224,344 | 2.40 | 154,113 | \$ 35,190 | \$ 3,056.87 | \$ 1.94 | 10,482 | 268 | 60% | 44% |
| 2009 | 225,581 | 2.41 | 152,553 | \$ 33,150 | \$ 2,823.81 | \$ 1.62 | 9,961 | 231 | 63% | 43% |
| 2010 | 227,054 | 2.42 | 153,022 | \$ 34,686 | \$ 2,923.31 | \$ 1.62 | 8,933 | 430 | 65% | 43% |
| 2011 | 228,095 | 2.41 | 154,652 | \$ 36,467 | \$ 3,071.53 | \$ 1.83 | 9,188 | 473 | 66% | 43% |
| 2012 | 229,604 | 2.40 | 155,911 | \$ 37,312 | \$ 3,176.49 | \$ 1.20 | 8,175 | 541 | 66% | 43% |
| 2013 | 231,160 | 2.38 | 157,866 | \$ 37,535 | \$ 3,230.40 | \$ 1.13 | 9,395 | 394 | 66% | 43% |
| 2014 | 232,756 | 2.37 | 159,844 | \$ 37,825 | \$ 3,285.31 | \$ 1.11 | 9,395 | 394 | 66% | 43% |
| 2015 | 234,372 | 2.36 | 161,853 | \$ 38,206 | \$ 3,341.24 | \$ 1.08 | 9,395 | 394 | 67% | 43% |
| 2016 | 236,001 | 2.35 | 163,876 | \$ 38,652 | \$ 3,398.19 | \$ 1.08 | 9,395 | 394 | 67% | 43% |
| 2017 | 237,650 | 2.34 | 165,927 | \$ 39,143 | \$ 3,456.19 | \$ 1.12 | 9,395 | 394 | 67% | 43% |
| 2018 | 239,317 | 2.34 | 168,007 | \$ 39,667 | \$ 3,515.29 | \$ 1.14 | 9,395 | 394 | 67% | 43% |
| 2019 | 240,998 | 2.33 | 170,105 | \$ 40,218 | \$ 3,575.45 | \$ 1.16 | 9,395 | 394 | 68% | 43% |
| 2020 | 242,682 | 2.33 | 172,227 | \$ 40,795 | \$ 3,636.72 | \$ 1.18 | 9,395 | 394 | 68% | 43% |
| 2021 | 244,381 | 2.33 | 174,383 | \$ 41,393 | \$ 3,699.13 | \$ 1.19 | 9,395 | 394 | 68% | 43% |
| 2022 | 246,083 | 2.33 | 176,560 | \$ 42,013 | \$ 3,762.70 | \$ 1.21 | 9,395 | 394 | 68% | 43% |
| 2023 | 247,783 | 2.33 | 178,764 | \$ 42,656 | \$ 3,827.42 | \$ 1.22 | 9,395 | 394 | 68% | 43% |
| 2024 | 249,492 | 2.33 | 180,993 | \$ 43,319 | \$ 3,893.35 | \$ 1.24 | 9,395 | 394 | 68% | 43% |
| 2025 | 251,191 | 2.33 | 183,258 | \$ 44,006 | \$ 3,960.48 | \$ 1.25 | 9,395 | 394 | 69% | 43% |
| 2026 | 252,895 | 2.33 | 185,544 | \$ 44,714 | \$ 4,028.85 | \$ 1.26 | 9,395 | 394 | 69% | 43% |
| 2027 | 254,595 | 2.34 | 187,853 | \$ 45,442 | \$ 4,098.49 | \$ 1.27 | 9,395 | 394 | 69% | 43% |
| 2028 | 256,289 | 2.34 | 190,200 | \$ 46,193 | \$ 4,169.40 | \$ 1.28 | 9,395 | 394 | 69% | 43% |
| 2029 | 257,973 | 2.34 | 192,579 | \$ 46,965 | \$ 4,241.62 | \$ 1.29 | 9,395 | 394 | 69% | 43% |
| 2030 | 259,649 | 2.35 | 194,974 | \$ 47,759 | \$ 4,315.16 | \$ 1.30 | 9,395 | 394 | 69% | 43% |
| 2031 | 261,331 | 2.35 | 197,409 | \$ 48,573 | \$ 4,390.08 | \$ 1.30 | 9,395 | 394 | 69% | 43% |
| 2032 | 263,002 | 2.36 | 199,871 | \$ 49,411 | \$ 4,466.34 | \$ 1.31 | 9,395 | 394 | 69% | 43% |
| 2033 | 264,675 | 2.36 | 202,372 | \$ 50,269 | \$ 4,544.01 | \$ 1.32 | 9,395 | 394 | 70% | 43% |
| 2034 | 266,345 | 2.36 | 204,897 | \$ 51,151 | \$ 4,623.10 | \$ 1.33 | 9,395 | 394 | 70% | 43% |
| 2035 | 268,010 | 2.37 | 207,454 | \$ 52,056 | \$ 4,703.66 | \$ 1.34 | 9,395 | 394 | 70% | 43% |
| 2036 | 269,678 | 2.37 | 210,047 | \$ 52,982 | \$ 4,785.70 | \$ 1.35 | 9,395 | 394 | 70% | 43% |
| 2037 | 271,359 | 2.38 | 212,667 | \$ 53,930 | \$ 4,869.24 | \$ 1.36 | 9,395 | 394 | 70% | 43% |
| 2038 | 273,048 | 2.38 | 215,333 | \$ 54,899 | \$ 4,954.35 | \$ 1.37 | 9,395 | 394 | 70% | 43% |
| 2039 | 274,737 | 2.38 | 218,031 | \$ 55,892 | \$ 5,040.96 | \$ 1.38 | 9,395 | 394 | 70% | 44% |
| 2040 | 276,425 | 2.39 | 220,766 | \$ 56,909 | \$ 5,129.16 | \$ 1.39 | 9,395 | 394 | 70% | 44% |
| 2041 | 278,123 | 2.39 | 223,534 | \$ 57,945 | \$ 5,218.92 | \$ 1.40 | 9,395 | 394 | 70% | 44% |
| 2042 | 279,832 | 2.39 | 226,338 | \$ 59,000 | \$ 5,310.24 | \$ 1.41 | 9,395 | 394 | 71% | 44% |

| Average Annual Growth Rates | | | | | | | | | | |
|-----------------------------|------|-------|------|------|-------|-------|-------|-------|------|-------|
| 1983-2012 | 0.3% | -0.6% | 1.4% | 2.4% | 1.7% | -0.4% | -0.5% | -0.6% | 1.0% | 3.6% |
| 1997-2012 | 0.4% | -0.4% | 0.9% | 2.9% | 1.4% | 1.1% | -1.2% | 2.4% | 0.8% | -0.5% |
| 2002-2012 | 0.6% | -0.2% | 0.8% | 2.6% | 1.1% | 1.8% | -1.5% | 0.6% | 1.5% | -0.3% |
| 2007-2012 | 0.6% | 0.0% | 0.3% | 2.9% | -0.1% | -6.6% | -2.8% | 2.3% | 2.4% | -1.0% |
| 2012-2017 | 0.7% | -0.5% | 1.3% | 1.0% | 1.7% | -1.4% | 2.8% | -6.1% | 0.4% | 0.0% |
| 2012-2022 | 0.7% | -0.3% | 1.3% | 1.2% | 1.7% | 0.1% | 1.4% | -3.1% | 0.3% | 0.0% |
| 2012-2032 | 0.7% | -0.1% | 1.2% | 1.4% | 1.7% | 0.5% | 0.7% | -1.6% | 0.3% | 0.1% |
| 2012-2042 | 0.7% | 0.0% | 1.3% | 1.5% | 1.7% | 0.5% | 0.5% | -1.1% | 0.2% | 0.1% |
| 2013-2042 | 0.7% | 0.0% | 1.3% | 1.6% | 1.7% | 0.8% | 0.0% | 0.0% | 0.2% | 0.1% |

Economic and demographic data is weighted for service territory

2.2 Forecast Database

A properly maintained database is one of the keys to the efficient completion of a forecast. This section describes the databases supporting the study and provides general descriptions of the most critical data.

2.2.1 Form 7 Data

Sales, revenue and consumer data by class and monthly peak data are compiled on a regular basis on RUS Form 7 by member system staff. The historic annual data from 1983 through 2012 for the member systems are the basis for the projection models used in the residential and small commercial classes. The historical data is included in Appendix C.

2.2.2 Demographic and Economic Database

Table 2.2 presents the definitions of the historic demographic and economic data used in the econometric analysis of residential use per consumer, general commercial sales and consumers.

Unless specifically noted, all data is taken from Woods and Poole economics, "*Complete Economic and Demographic Data Source*" (CEDDS), 2013. The data originates from government agencies such as the Bureau of Labor Statistics, Department of Commerce and the U.S. Census Bureau. Woods & Poole makes adjustments to this data to arrive at county-level annual projections. Woods & Poole can be contacted at the following address:

Woods & Poole Economics, Inc.
1794 Columbia Road, NW
Washington, DC 20009
202.332.7111

County data, unless otherwise specified, was weighted by each cooperative's estimate of the percentage of residential customers served by the cooperative as compared to the total number of residential customers in each of the counties in the cooperative's service area.

Table 2.2

Variables Considered in Econometric Models
Minnkota Power Cooperative, Inc.

| <u>Variable:</u> | <u>Description of Variable:</u> |
|------------------|--|
| RESCON | Number of residential customers |
| SCCON | Number of small commercial customers |
| RESPRI05 | Average revenue per kWh for residential customers (\$2005) |
| SCPRI05 | Average commercial revenue per kWh (\$2005) |
| SHSAT | Electric space heat saturation percent – service territory |
| ACSAT | Air conditioning saturation percent – service territory |
| PCE05 | Personal Consumption Expenditure Deflator, 2005 = 100 |
| LPG05 | Propane gas price (\$2005) |
| NGAS05 | Natural gas price (\$2005) |
| NO2OIL | No. 2 Fuel Oil price (\$2005) |
| HDD | Heating degree days |
| CDD | Cooling degree days |
| POP | Total population |
| HH | Total number of households |
| PPHH | Persons per household |
| TEMP | Total employment |
| CEMP | Construction employment |
| REMP | Retail employment |
| SEMP | Service employment |
| MEMP | Manufacturing employment |
| FEMP | Farm employment |
| RSLs | Real retail sales (millions of 2005\$) |
| TPI05 | Real total personal income (millions of 2005\$) |
| PCI05 | Real per capita income (\$2005) |
| MHI05 | Real income per household (\$2005) |
| GRP05 | Gross Regional Product (millions of 2005\$) |

2.2.3 Climate Data

Historical weather data was gathered from the Midwestern Climate Center's (www.mcc.sws.uiuc.edu) on-line retrieval system. The web site allows access to thousands of local weather stations across the southern United States. Whenever possible, local weather stations that would accurately reflect the climate history of each cooperative were used. If a station was not available in the service area, the nearest station with complete data was used.

2.2.4 Real Electricity Prices

Forecasts of the member systems' real electricity prices for the residential and commercial classes were developed using the following steps:

1. Historical average retail electricity prices were calculated by dividing the total class revenue by the total class kWh sales.
2. Minnkota provided the historical and projected average wholesale power cost.
3. Historical average purchased power costs were calculated by dividing the cost of purchases by total kWh purchased. Purchased power cost projections were based on the percent increase in Minnkota's average wholesale rates.
4. The historical retail markup was calculated as the difference between the average revenue per kWh less the purchased power costs. The projected retail mark-up was escalated at 3.0 percent per year for most systems.
5. Projected average retail electricity prices were calculated as the sum of the purchased power cost and retail markup.
6. The historical and projected electricity prices were converted to real (inflation-adjusted) terms by dividing the nominal prices by the price deflator for Personal Consumption Expenditures (PCE).
7. The forecasts were reviewed with member system staff and adjusted as necessary.

2.2.5 Real Alternate Fuel Prices

The decision over the preferred fuel source that end-users make when purchasing appliances is driven to some extent by the relative fuel price to electricity prices. In most cases, there is at least one major alternative to electricity such as natural gas, propane or wood. Propane has traditionally been the alternate fuel of choice, and has been confirmed by the residential survey data. Because of this, propane was evaluated for its impact on the residential and commercial classes for most of the Members. However, natural gas is more prevalent in Cass County and Nodak's territory and was thus used in their projections.

The projected prices were calculated by analyzing the growth rates of national drivers such as U.S. wellhead natural gas price and crude oil prices. The historical and projected price for propane is shown in Table 2.1.

2.2.6 Major Appliance Saturations

An important variable to consider is the saturation levels of electric appliances. Historic saturation information comes from market research surveys conducted in 1988, 1990, 1993, 1996, 1999, 2005 and 2010. The intervening years have been interpolated. Survey results indicate the percentage of appliance units by age and by type of unit for the service area.

The methodology for air conditioning saturations was developed based on the split between new and existing homes. Residential customers were split into new and existing homes. Based on data collected from the survey, the percentage of new homes with central air conditioning (traditional or heat pump) was applied to the number of new residential customers. A retrofit of existing homes percentage was developed based on survey data and applied to the existing residential customers. No age replacement was utilized as the assumption was that once a customer had air conditioning, they would replace it with a new unit if the appliance failed. Table 2.1 presents the historic and projected air conditioning saturation percentages at the Minnkota level.

The forecast for electric space heat saturation levels required assumptions regarding the number of new households in the service area, the preference for electric space heating

systems and the replacement of existing electric units. The projection of the number of households in the counties served by the member cooperative was used to estimate the number of new households in the service area. The preference for electric space heating systems was determined from the survey responses regarding first choice of energy source. The preference was used to estimate the number of new households with electric space heating units.

The next step involved determining the number of existing households that would replace space heating units. The households with existing electric units were split into four groups: those with units 0-5 years old, 6-10 years old, 11-15 years old and over 16 years. Of units sixteen years or older, 25% were expected to be replaced within five years, while 50% were expected to be replaced within ten years. For units 11-15 years old, 25% were expected to be replaced by ten years. Units less than ten years old were not expected to be replaced during the study period. The preference for electric space heating systems was used to estimate the replacement rates for existing units. Projected saturation levels were obtained by dividing the sum of new and existing households with electric space heating systems by the total number of households in the service area. Table 2.1 presents the above mentioned saturation forecasts for Minnkota.

SECTION 3
SYSTEM FORECASTS

Section 3

System Forecasts

3.1 Background

Economic forecasting typically takes one of two forms. The first is based on the assumption that the historic relationship between the explanatory or forecast variable and the exogenous factors that impact it will remain the same. Econometric models and growth rate analysis often follow this form. The second form is more speculative and based on the concept that the historic relationship has changed and the future will diverge from the past. This is typified by judgment forecasts.

The underlying hypothesis of this study is that the cooperative's future energy sales growth, in general, is likely to be determined by the same factors that have influenced the growth in the past. The forecasts of consumers and electricity sales were developed based on the weather, economic, and demographic factors identified which affect the customer classes of the cooperative's system:

The following customer classes for the member cooperatives have been projected in this study:

- Residential
- Seasonal
- Irrigation
- Small Commercial
- Large Commercial
- Street and Highway Lighting
- Public Authority
- Resale – RUS
- Resale – Other

The sum of these classes makes up the retail sales for the member cooperatives. When added together with the member cooperatives' own energy use and unaccounted for energy (typically losses) the result is the total energy required by each cooperative from

Minnkota. Both energy and demand are projected for this study. These forecasts are discussed in the following sections.

3.1.1 Selected Forecast Methods

As discussed in Section 1.5, econometric forecasting methods are particularly suited to capture the growth in energy sales for the member systems since these models can directly reflect:

- The influence of electric prices on usage
- Customer preferences for competing fuel sources as a function of relative prices
- The impact of variations in weather on usage
- The influence of consumer well being on appliance acquisitions and subsequent electric usage

Econometric models also provide annual forecasts that can readily be tracked and updated and provide an effective methodology for evaluating alternate forecast scenarios. In recognition of these strengths, econometric methods have been chosen to forecast energy sales and customers for most of the Minnkota member systems. Tables that summarize the econometric models are included in the corresponding member system reports. Where econometric models were impractical and for the smaller classes, trending and judgment were used to forecast customers and energy.

3.2 Energy Forecasts – Retail Customer Classes

3.2.1 Residential Class Forecast

This class accounted for about 91 percent of member system customers in 2012 and 54 percent of total energy sales. Energy sales to the residential sector grew at an average annual rate of 1.9 percent during the study period (1983-2012).

Residential Customers Forecast

Residential customer growth has been projected by analyzing the historic relationship between residential customers and area growth in the number of households. This method measures the relationship between the cooperative's residential customers and

unweighted county data in order to capture the subtle shifts that occur between counties over time. A growth index has been used to more accurately measure the relationship between residential customer growth and county growth.

The resulting county share index was multiplied by the forecast of total households in counties to obtain the projected number of residential customers. This forecast is shown in Table 3.1 for the years 2013 to 2042. It indicates the number of residential customers will grow 1.1 percent per year, from 109,913 to 152,239, during the 2013 to 2042 period. This compares to the 2.1 percent growth rate for the 1983 to 2012 period.

Residential Energy Sales Per Customer Forecast

Econometric models have been developed for residential energy sales per customer for each of the member systems. These models are presented in the respective member system reports. The equations relate residential energy sales per customer to a variety of variables such as, the real (2005\$) residential price of electricity, the real price of propane or natural gas, heating degree-days, cooling-degree days, electric space heat saturations, central air conditioning saturations, persons per household and real average household income. The variables were converted to natural logs before computation.

To understand the mechanics of the models, refer again to Appendix B. The rationale for choosing these variables can be summarized as follows. One of the primary principals of economics is that the price of a commodity influences the quantity of that commodity demanded. Demand is also influenced by the prices of competing product choices. The heating and cooling degree-day variables capture the variability of sales due to temperature. Electric air conditioning and space heat saturations represent the use of electricity from major appliances in the service area. The inclusion of an income variable is designed to capture customer's appetites for more appliances, larger homes and sensitivity to price changes. With the projected increases in electric price, household income and appliance saturations, the member systems are expected to see residential energy sales per customer remain relatively flat through 2042. This projection is shown in Table 3.2 by member system.

Table 3.1

Residential Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Red | Wild | Total Members |
|-----------------------------|----------|--------|-------------|-------|--------|-------|-------|-------|-------|--------|--------|---------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Roseau | Rice | |
| 1983 | 8,663 | 8,840 | 1,565 | 3,042 | 11,695 | 3,028 | 3,594 | 4,561 | 3,858 | 3,709 | 7,956 | 60,510 |
| 1984 | 8,925 | 8,945 | 1,555 | 2,862 | 11,753 | 3,076 | 3,575 | 4,551 | 3,847 | 3,752 | 8,087 | 60,929 |
| 1985 | 9,111 | 9,240 | 1,528 | 2,661 | 11,805 | 3,093 | 3,555 | 4,502 | 3,835 | 3,840 | 8,190 | 61,360 |
| 1986 | 9,267 | 9,774 | 1,508 | 2,647 | 11,817 | 3,089 | 3,559 | 4,473 | 3,844 | 3,945 | 8,270 | 62,192 |
| 1987 | 9,435 | 9,989 | 1,499 | 2,650 | 11,853 | 3,120 | 3,545 | 4,448 | 3,856 | 4,082 | 8,400 | 62,877 |
| 1988 | 9,688 | 10,207 | 1,482 | 2,670 | 11,799 | 3,176 | 3,555 | 4,433 | 3,850 | 4,257 | 8,497 | 63,612 |
| 1989 | 9,918 | 10,782 | 1,473 | 2,683 | 11,801 | 3,257 | 3,531 | 4,430 | 3,845 | 4,388 | 8,569 | 64,675 |
| 1990 | 10,077 | 11,289 | 1,456 | 2,725 | 11,741 | 3,398 | 3,494 | 4,422 | 3,841 | 4,504 | 8,672 | 65,616 |
| 1991 | 10,283 | 11,761 | 1,440 | 2,750 | 11,718 | 3,508 | 3,478 | 4,425 | 3,826 | 4,600 | 8,761 | 66,550 |
| 1992 | 10,550 | 12,557 | 1,435 | 2,778 | 11,750 | 3,559 | 3,473 | 4,420 | 3,817 | 4,694 | 8,875 | 67,908 |
| 1993 | 10,874 | 13,359 | 1,437 | 2,822 | 11,847 | 3,606 | 3,482 | 4,444 | 3,848 | 4,734 | 9,051 | 69,503 |
| 1994 | 11,214 | 14,147 | 1,431 | 2,843 | 11,994 | 3,663 | 3,479 | 4,446 | 3,864 | 4,801 | 9,086 | 70,966 |
| 1995 | 11,599 | 14,881 | 1,426 | 2,890 | 12,026 | 3,702 | 3,478 | 4,465 | 3,891 | 4,932 | 9,243 | 72,532 |
| 1996 | 11,931 | 15,872 | 1,414 | 3,016 | 12,119 | 3,750 | 3,474 | 4,493 | 3,924 | 5,053 | 9,425 | 74,471 |
| 1997 | 12,256 | 16,144 | 1,400 | 3,213 | 12,323 | 3,799 | 3,453 | 4,496 | 3,960 | 5,131 | 9,589 | 75,764 |
| 1998 | 12,668 | 16,830 | 1,381 | 3,402 | 12,431 | 3,866 | 3,421 | 4,507 | 3,972 | 5,204 | 9,732 | 77,412 |
| 1999 | 13,074 | 17,592 | 1,365 | 3,497 | 12,342 | 3,941 | 3,407 | 4,518 | 3,994 | 5,250 | 9,902 | 78,882 |
| 2000 | 13,491 | 18,342 | 1,353 | 3,552 | 12,683 | 4,011 | 3,396 | 4,524 | 3,984 | 5,376 | 10,152 | 80,863 |
| 2001 | 14,003 | 19,242 | 1,347 | 3,608 | 15,134 | 4,074 | 3,370 | 4,532 | 4,021 | 5,343 | 10,368 | 85,044 |
| 2002 | 14,580 | 20,418 | 1,345 | 3,680 | 15,091 | 4,127 | 3,367 | 4,551 | 4,079 | 5,406 | 10,595 | 87,238 |
| 2003 | 15,140 | 21,723 | 1,345 | 3,749 | 15,395 | 4,174 | 3,365 | 4,586 | 4,135 | 5,475 | 10,865 | 89,950 |
| 2004 | 15,749 | 23,261 | 1,340 | 3,812 | 15,712 | 4,212 | 3,359 | 4,628 | 4,177 | 5,526 | 11,188 | 92,964 |
| 2005 | 16,162 | 25,144 | 1,337 | 3,889 | 15,910 | 4,251 | 3,378 | 4,644 | 4,142 | 5,570 | 11,446 | 95,873 |
| 2006 | 16,717 | 26,838 | 1,329 | 3,953 | 16,154 | 4,407 | 3,342 | 4,674 | 4,172 | 5,625 | 12,476 | 99,685 |
| 2007 | 17,208 | 28,117 | 1,332 | 4,003 | 16,345 | 4,505 | 3,340 | 4,710 | 4,181 | 5,662 | 12,842 | 102,245 |
| 2008 | 17,587 | 29,124 | 1,344 | 4,035 | 16,526 | 4,568 | 3,339 | 4,747 | 4,200 | 5,679 | 12,933 | 104,083 |
| 2009 | 18,617 | 29,920 | 1,346 | 4,052 | 16,696 | 4,628 | 3,331 | 4,792 | 4,183 | 5,664 | 12,965 | 106,193 |
| 2010 | 18,781 | 30,611 | 1,354 | 4,080 | 16,813 | 4,682 | 3,323 | 4,827 | 4,132 | 5,630 | 13,000 | 107,232 |
| 2011 | 18,827 | 31,405 | 1,367 | 4,094 | 16,910 | 4,746 | 3,334 | 4,835 | 4,134 | 5,636 | 13,039 | 108,326 |
| 2012 | 18,847 | 32,632 | 1,378 | 4,095 | 17,069 | 4,828 | 3,373 | 4,839 | 4,130 | 5,634 | 13,090 | 109,913 |
| 2013 | 18,897 | 34,017 | 1,386 | 4,101 | 17,244 | 4,899 | 3,393 | 4,844 | 4,145 | 5,639 | 13,125 | 111,689 |
| 2014 | 18,997 | 35,402 | 1,396 | 4,114 | 17,428 | 4,974 | 3,413 | 4,851 | 4,170 | 5,649 | 13,160 | 113,554 |
| 2015 | 19,147 | 36,787 | 1,405 | 4,131 | 17,608 | 5,047 | 3,433 | 4,861 | 3,805 | 5,664 | 13,195 | 115,083 |
| 2016 | 19,347 | 38,137 | 1,413 | 4,151 | 17,776 | 5,119 | 3,453 | 4,876 | 3,840 | 5,684 | 13,230 | 117,025 |
| 2017 | 19,581 | 39,452 | 1,420 | 4,175 | 17,929 | 5,187 | 3,473 | 4,891 | 3,875 | 5,714 | 13,265 | 118,962 |
| 2018 | 19,797 | 40,732 | 1,425 | 4,196 | 18,079 | 5,250 | 3,493 | 4,906 | 3,900 | 5,749 | 13,300 | 120,827 |
| 2019 | 20,000 | 41,977 | 1,430 | 4,214 | 18,229 | 5,312 | 3,513 | 4,921 | 3,915 | 5,789 | 13,335 | 122,634 |
| 2020 | 20,194 | 43,187 | 1,434 | 4,230 | 18,379 | 5,371 | 3,533 | 4,936 | 3,925 | 5,820 | 13,370 | 124,378 |
| 2021 | 20,382 | 44,362 | 1,437 | 4,246 | 18,529 | 5,429 | 3,553 | 4,951 | 3,935 | 5,849 | 13,405 | 126,077 |
| 2022 | 20,554 | 45,502 | 1,440 | 4,258 | 18,679 | 5,485 | 3,573 | 4,966 | 3,945 | 5,873 | 13,440 | 127,715 |
| 2023 | 20,715 | 46,607 | 1,442 | 4,269 | 18,829 | 5,538 | 3,593 | 4,981 | 3,955 | 5,895 | 13,475 | 129,298 |
| 2024 | 20,869 | 47,677 | 1,443 | 4,278 | 18,979 | 5,590 | 3,613 | 4,996 | 3,965 | 5,914 | 13,510 | 130,833 |
| 2025 | 21,016 | 48,712 | 1,444 | 4,286 | 19,129 | 5,640 | 3,633 | 5,011 | 3,975 | 5,932 | 13,545 | 132,323 |
| 2026 | 21,158 | 49,712 | 1,444 | 4,293 | 19,279 | 5,691 | 3,653 | 5,026 | 3,985 | 5,948 | 13,580 | 133,769 |
| 2027 | 21,296 | 50,677 | 1,445 | 4,300 | 19,429 | 5,740 | 3,673 | 5,041 | 3,995 | 5,964 | 13,615 | 135,175 |
| 2028 | 21,429 | 51,607 | 1,445 | 4,306 | 19,579 | 5,790 | 3,693 | 5,056 | 4,005 | 5,978 | 13,650 | 136,538 |
| 2029 | 21,558 | 52,502 | 1,445 | 4,312 | 19,729 | 5,839 | 3,713 | 5,071 | 4,015 | 5,991 | 13,685 | 137,860 |
| 2030 | 21,681 | 53,362 | 1,444 | 4,317 | 19,879 | 5,888 | 3,733 | 5,086 | 4,025 | 6,003 | 13,720 | 139,138 |
| 2031 | 21,802 | 54,187 | 1,443 | 4,321 | 20,029 | 5,936 | 3,753 | 5,101 | 4,035 | 6,015 | 13,755 | 140,377 |
| 2032 | 21,920 | 54,977 | 1,443 | 4,326 | 20,179 | 5,983 | 3,773 | 5,116 | 4,045 | 6,025 | 13,790 | 141,577 |
| 2033 | 22,035 | 55,732 | 1,442 | 4,330 | 20,329 | 6,032 | 3,793 | 5,131 | 4,055 | 6,036 | 13,825 | 142,739 |
| 2034 | 22,149 | 56,452 | 1,441 | 4,334 | 20,479 | 6,080 | 3,813 | 5,146 | 4,065 | 6,046 | 13,860 | 143,865 |
| 2035 | 22,261 | 57,137 | 1,440 | 4,338 | 20,629 | 6,129 | 3,833 | 5,161 | 4,075 | 6,055 | 13,895 | 144,952 |
| 2036 | 22,372 | 57,787 | 1,439 | 4,342 | 20,779 | 6,179 | 3,853 | 5,176 | 4,085 | 6,065 | 13,930 | 146,007 |
| 2037 | 22,486 | 58,427 | 1,438 | 4,347 | 20,929 | 6,229 | 3,873 | 5,191 | 4,095 | 6,076 | 13,965 | 147,056 |
| 2038 | 22,602 | 59,057 | 1,438 | 4,353 | 21,079 | 6,281 | 3,893 | 5,206 | 4,105 | 6,087 | 14,000 | 148,102 |
| 2039 | 22,722 | 59,677 | 1,437 | 4,360 | 21,229 | 6,335 | 3,913 | 5,221 | 4,115 | 6,100 | 14,035 | 149,144 |
| 2040 | 22,845 | 60,287 | 1,437 | 4,368 | 21,379 | 6,391 | 3,933 | 5,236 | 4,125 | 6,113 | 14,070 | 150,184 |
| 2041 | 22,969 | 60,887 | 1,437 | 4,376 | 21,529 | 6,448 | 3,953 | 5,251 | 4,135 | 6,127 | 14,105 | 151,216 |
| 2042 | 23,093 | 61,477 | 1,437 | 4,384 | 21,679 | 6,505 | 3,973 | 5,266 | 4,145 | 6,140 | 14,140 | 152,239 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | 2.7% | 4.6% | -0.4% | 1.0% | 1.3% | 1.6% | -0.2% | 0.2% | 0.2% | 1.5% | 1.7% | 2.1% |
| 1997-2012 | 2.9% | 4.8% | -0.1% | 1.6% | 2.2% | 1.6% | -0.2% | 0.5% | 0.3% | 0.6% | 2.1% | 2.5% |
| 2002-2012 | 2.6% | 4.8% | 0.2% | 1.1% | 1.2% | 1.6% | 0.0% | 0.6% | 0.1% | 0.4% | 2.1% | 2.3% |
| 2007-2012 | 1.8% | 3.0% | 0.7% | 0.5% | 0.9% | 1.4% | 0.2% | 0.5% | -0.2% | -0.1% | 0.4% | 1.5% |
| 2012-2017 | 0.8% | 3.9% | 0.6% | 0.4% | 1.0% | 1.4% | 0.6% | 0.2% | -1.3% | 0.3% | 0.3% | 1.6% |
| 2012-2022 | 0.9% | 3.4% | 0.4% | 0.4% | 0.9% | 1.3% | 0.6% | 0.3% | -0.5% | 0.4% | 0.3% | 1.5% |
| 2012-2032 | 0.8% | 2.6% | 0.2% | 0.3% | 0.8% | 1.1% | 0.6% | 0.3% | -0.1% | 0.3% | 0.3% | 1.3% |
| 2012-2042 | 0.7% | 2.1% | 0.1% | 0.2% | 0.8% | 1.0% | 0.5% | 0.3% | 0.0% | 0.3% | 0.3% | 1.1% |
| 2013-2042 | 0.7% | 2.1% | 0.1% | 0.2% | 0.8% | 1.0% | 0.5% | 0.3% | 0.0% | 0.3% | 0.3% | 1.1% |

Residential Energy Sales Forecast

The total residential energy sales forecast is summarized in Table 3.3. The projected growth in the number of customers results in projected sales growth to this class. Growth in total energy sales to the residential class is expected to average 1.1 percent per year through 2042. This is slower than the average annual growth from 1983 to 2012. Total residential sales are forecast to reach 2,633,422 MWh by 2042.

3.2.2 Seasonal Class Forecast

Seasonal energy sales accounted for less than 1 percent of total cooperative energy sales in 2012. Sales projections for this class are based on discussions with cooperative staff. The forecasts for the member systems' seasonal energy sales are shown in Table 3.4. Solid growth is expected from this class over the forecast horizon. The primary drivers for this class are the wide variety of year-round recreational activities available.

3.2.3 Irrigation Class Forecast

The irrigation class has historically been one of the most volatile classes, primarily due to the sensitive relationship between crops, watering cycles and weather. The number of consumers in this class was 434 in 2012, while energy sales were 17,400 MWh. Member system sales were typically projected based on a five-year average of the 2008-2012 period. As shown in Table 3.5, sales are projected to grow slowly through 2042.

3.2.4 General Commercial Class Forecast

The definition for the commercial class differs somewhat from the Form 7 classification of small and large commercial accounts. Large commercial customers are identified as commercial accounts with over 1,000 kVA transformer capacity or one million kWh or more of annual usage. These accounts are subtracted from the total Form 7 small and large commercial data. The remaining commercial accounts represent the general commercial class. For Nodak, this threshold was set at 3 million kWh, due to the number of large accounts. Cass County has a three tier definition that separates the commercial class into small (below 1 million kWh), intermediate (1-4 million kWh) and large (4 million kWh and above). The large commercial accounts are projected individually based on input from cooperative staff.

Table 3.4

Seasonal Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Roseau | Wild | Total Member Sales |
|-----------------------------|----------|--------|-------------|---------|---------|-------|-----|------|-------|--------|---------|--------------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Rice | | |
| 1983 | 2,538 | - | - | 560 | 507 | 1,573 | - | - | - | 1,409 | 1,994 | 8,581 |
| 1984 | 2,497 | - | - | 555 | 611 | 1,687 | - | - | - | 1,663 | 1,752 | 8,766 |
| 1985 | 2,852 | - | - | 569 | 854 | 1,855 | - | - | - | 1,482 | 1,886 | 9,498 |
| 1986 | 2,657 | - | - | 605 | 800 | 1,774 | - | - | - | 1,463 | 1,909 | 9,209 |
| 1987 | 2,827 | - | - | 564 | 496 | 1,983 | - | - | - | 1,459 | 2,033 | 9,362 |
| 1988 | 2,850 | - | - | 657 | 555 | 2,128 | - | - | - | 1,725 | 2,024 | 9,939 |
| 1989 | 3,039 | - | - | 735 | 643 | 2,235 | - | - | - | 2,126 | 2,069 | 10,846 |
| 1990 | 3,249 | - | - | 782 | 665 | 2,166 | - | - | - | 2,358 | 2,133 | 11,352 |
| 1991 | 3,482 | - | - | 745 | 689 | 1,618 | - | - | - | 2,644 | 2,156 | 11,334 |
| 1992 | 3,681 | - | - | 806 | 786 | 1,771 | - | - | - | 2,729 | 2,197 | 11,970 |
| 1993 | 3,809 | - | - | 968 | 831 | 1,803 | - | - | - | 3,264 | 2,090 | 12,765 |
| 1994 | 3,725 | - | - | 1,017 | 727 | 1,803 | - | - | - | 2,920 | 2,025 | 12,217 |
| 1995 | 3,975 | - | - | 987 | 676 | 1,998 | - | - | - | 3,217 | 2,108 | 12,961 |
| 1996 | 4,003 | - | - | 1,286 | 714 | 1,904 | - | - | - | 4,460 | 2,115 | 14,483 |
| 1997 | 4,210 | - | - | 743 | 703 | 2,105 | - | - | - | 4,064 | 2,191 | 14,015 |
| 1998 | 4,028 | - | - | 308 | 828 | 2,129 | - | - | - | 3,754 | 2,166 | 13,213 |
| 1999 | 4,729 | - | - | - | 964 | 2,217 | - | - | - | 4,148 | 2,246 | 14,305 |
| 2000 | 4,463 | - | - | - | 997 | 2,212 | - | - | - | 4,592 | 2,279 | 14,542 |
| 2001 | 4,315 | - | - | - | - | 2,299 | - | - | - | 5,028 | 2,413 | 14,055 |
| 2002 | 4,325 | - | - | - | 685 | 2,415 | - | - | - | 5,390 | 2,485 | 15,300 |
| 2003 | 4,075 | - | - | - | - | 2,523 | - | - | - | 5,542 | 2,364 | 14,504 |
| 2004 | 3,652 | - | - | - | - | 2,568 | - | - | - | 5,584 | 2,474 | 14,277 |
| 2005 | 3,242 | - | - | - | - | 2,659 | - | - | - | 5,509 | 2,209 | 13,619 |
| 2006 | 2,574 | - | - | - | - | 2,404 | - | - | - | 5,577 | 3 | 10,558 |
| 2007 | 1,963 | - | - | - | - | 2,183 | - | - | - | 5,882 | - | 10,027 |
| 2008 | 1,840 | - | - | - | - | 2,052 | - | - | - | 6,180 | - | 10,072 |
| 2009 | - | - | - | - | - | 2,045 | - | - | - | 6,739 | - | 8,784 |
| 2010 | - | - | - | - | - | 1,900 | - | - | - | 6,110 | - | 8,010 |
| 2011 | - | - | - | - | - | 1,724 | - | - | - | 6,415 | - | 8,138 |
| 2012 | - | - | - | - | - | 1,586 | - | - | - | 6,469 | - | 8,056 |
| 2013 | - | - | - | - | - | 1,575 | - | - | - | 6,581 | - | 8,156 |
| 2014 | - | - | - | - | - | 1,564 | - | - | - | 6,632 | - | 8,196 |
| 2015 | - | - | - | - | - | 1,553 | - | - | - | 6,683 | - | 8,236 |
| 2016 | - | - | - | - | - | 1,542 | - | - | - | 6,734 | - | 8,276 |
| 2017 | - | - | - | - | - | 1,531 | - | - | - | 6,784 | - | 8,315 |
| 2018 | - | - | - | - | - | 1,520 | - | - | - | 6,835 | - | 8,355 |
| 2019 | - | - | - | - | - | 1,509 | - | - | - | 6,886 | - | 8,395 |
| 2020 | - | - | - | - | - | 1,499 | - | - | - | 6,937 | - | 8,435 |
| 2021 | - | - | - | - | - | 1,488 | - | - | - | 6,988 | - | 8,476 |
| 2022 | - | - | - | - | - | 1,478 | - | - | - | 7,038 | - | 8,516 |
| 2023 | - | - | - | - | - | 1,467 | - | - | - | 7,089 | - | 8,556 |
| 2024 | - | - | - | - | - | 1,457 | - | - | - | 7,140 | - | 8,597 |
| 2025 | - | - | - | - | - | 1,446 | - | - | - | 7,191 | - | 8,637 |
| 2026 | - | - | - | - | - | 1,436 | - | - | - | 7,241 | - | 8,677 |
| 2027 | - | - | - | - | - | 1,426 | - | - | - | 7,292 | - | 8,718 |
| 2028 | - | - | - | - | - | 1,416 | - | - | - | 7,343 | - | 8,759 |
| 2029 | - | - | - | - | - | 1,406 | - | - | - | 7,394 | - | 8,799 |
| 2030 | - | - | - | - | - | 1,396 | - | - | - | 7,445 | - | 8,840 |
| 2031 | - | - | - | - | - | 1,386 | - | - | - | 7,495 | - | 8,881 |
| 2032 | - | - | - | - | - | 1,376 | - | - | - | 7,546 | - | 8,922 |
| 2033 | - | - | - | - | - | 1,366 | - | - | - | 7,597 | - | 8,963 |
| 2034 | - | - | - | - | - | 1,356 | - | - | - | 7,648 | - | 9,004 |
| 2035 | - | - | - | - | - | 1,346 | - | - | - | 7,699 | - | 9,045 |
| 2036 | - | - | - | - | - | 1,337 | - | - | - | 7,749 | - | 9,086 |
| 2037 | - | - | - | - | - | 1,327 | - | - | - | 7,800 | - | 9,127 |
| 2038 | - | - | - | - | - | 1,318 | - | - | - | 7,851 | - | 9,169 |
| 2039 | - | - | - | - | - | 1,308 | - | - | - | 7,902 | - | 9,210 |
| 2040 | - | - | - | - | - | 1,299 | - | - | - | 7,953 | - | 9,251 |
| 2041 | - | - | - | - | - | 1,290 | - | - | - | 8,003 | - | 9,293 |
| 2042 | - | - | - | - | - | 1,280 | - | - | - | 8,054 | - | 9,334 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | -100.0% | -- | -- | -100.0% | -100.0% | 0.0% | -- | -- | -- | 5.4% | -100.0% | -0.2% |
| 1997-2012 | -100.0% | -- | -- | -100.0% | -100.0% | -1.9% | -- | -- | -- | 3.1% | -100.0% | -3.6% |
| 2002-2012 | -100.0% | -- | -- | -- | -100.0% | -4.1% | -- | -- | -- | 1.8% | -100.0% | -6.2% |
| 2007-2012 | -100.0% | -- | -- | -- | -- | -6.2% | -- | -- | -- | 1.9% | -- | -4.3% |
| 2012-2017 | -- | -- | -- | -- | -- | -0.7% | -- | -- | -- | 1.0% | -- | 0.6% |
| 2012-2022 | -- | -- | -- | -- | -- | -0.7% | -- | -- | -- | 0.8% | -- | 0.6% |
| 2012-2032 | -- | -- | -- | -- | -- | -0.7% | -- | -- | -- | 0.8% | -- | 0.5% |
| 2012-2042 | -- | -- | -- | -- | -- | -0.7% | -- | -- | -- | 0.7% | -- | 0.5% |
| 2013-2042 | -- | -- | -- | -- | -- | -0.7% | -- | -- | -- | 0.7% | -- | 0.5% |

Table 3.5

Irrigation Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Beltrami | Cass County | Clearwater-Cavalier | Polk | Nodak | North Star | PKM | Red Lake | Red River | Roseau | Wild Rice | Total Member Sales |
|-----------------------------|----------|-------------|---------------------|--------|--------|------------|-------|----------|-----------|--------|-----------|--------------------|
| 1983 | - | 5,947 | - | 610 | 1,443 | - | 124 | - | 109 | - | 457 | 8,691 |
| 1984 | 65 | 7,693 | - | 580 | 2,153 | - | 233 | - | 227 | - | 479 | 11,430 |
| 1985 | 49 | 6,493 | - | 458 | 1,472 | - | 8 | - | 99 | - | 31 | 8,609 |
| 1986 | 124 | 4,326 | - | 475 | 968 | - | 124 | - | 176 | - | 122 | 6,313 |
| 1987 | 118 | 6,891 | - | 642 | 1,082 | - | 90 | - | 120 | - | 355 | 9,299 |
| 1988 | 160 | 10,230 | - | 486 | 2,800 | - | 79 | - | 373 | - | 30 | 14,158 |
| 1989 | 114 | 6,649 | - | 399 | 2,697 | - | 80 | - | 300 | - | 181 | 10,420 |
| 1990 | 213 | 6,808 | - | 534 | 2,175 | - | 81 | - | 396 | - | 163 | 10,370 |
| 1991 | 160 | 6,575 | - | 595 | 3,311 | - | 92 | 240 | 253 | - | 75 | 11,301 |
| 1992 | 109 | 4,068 | - | 767 | 3,407 | - | 165 | 279 | 335 | - | 116 | 9,246 |
| 1993 | 74 | 2,415 | - | 475 | 1,232 | - | 120 | 291 | 262 | - | 79 | 4,947 |
| 1994 | 97 | 5,136 | - | 486 | 2,604 | - | 104 | 177 | 376 | - | 79 | 9,058 |
| 1995 | 140 | 5,323 | - | 345 | 3,216 | - | 53 | 136 | 464 | - | 201 | 9,879 |
| 1996 | 136 | 5,800 | - | 301 | 3,749 | - | 144 | 283 | 530 | - | 137 | 11,080 |
| 1997 | 241 | 4,209 | - | 391 | 3,578 | - | 178 | 192 | 519 | - | 62 | 9,371 |
| 1998 | 224 | 4,904 | - | 615 | 5,593 | - | 277 | 306 | 361 | - | 129 | 12,410 |
| 1999 | 227 | 3,925 | - | 337 | 4,349 | - | 317 | 361 | 329 | - | 100 | 9,945 |
| 2000 | 160 | 4,067 | - | 643 | 3,770 | - | 63 | 539 | 258 | - | 522 | 10,023 |
| 2001 | 216 | 4,633 | - | 351 | 2,128 | - | 346 | 279 | 414 | - | 195 | 8,563 |
| 2002 | 123 | 5,040 | - | 452 | 3,264 | - | 227 | 347 | 202 | - | 121 | 9,776 |
| 2003 | 130 | 6,223 | - | 610 | 5,019 | - | 243 | 344 | 461 | - | 168 | 13,198 |
| 2004 | 147 | 4,901 | - | 879 | 4,274 | - | 453 | 372 | 46 | - | 156 | 11,228 |
| 2005 | 134 | 2,900 | - | 684 | 3,910 | - | 164 | 247 | 67 | - | 312 | 8,417 |
| 2006 | 156 | 7,509 | - | 517 | 8,282 | - | 376 | 146 | 186 | - | 245 | 17,417 |
| 2007 | 212 | 5,237 | - | 828 | 4,622 | - | 458 | 391 | 143 | - | 161 | 12,052 |
| 2008 | 155 | 6,042 | - | 921 | 5,505 | - | 517 | 263 | 97 | - | 95 | 13,595 |
| 2009 | 78 | 4,644 | - | 587 | 5,423 | - | 439 | 235 | 121 | - | 145 | 11,672 |
| 2010 | 56 | 3,130 | - | 614 | 4,792 | - | 828 | 238 | 111 | - | 290 | 10,058 |
| 2011 | 51 | 1,929 | - | 407 | 3,488 | - | 616 | 218 | 30 | - | 342 | 7,081 |
| 2012 | 92 | 6,603 | - | 430 | 8,467 | - | 895 | 238 | 265 | - | 411 | 17,400 |
| 2013 | 75 | 4,492 | - | 473 | 8,573 | - | 733 | 259 | 117 | - | 352 | 15,073 |
| 2014 | 75 | 4,492 | - | 473 | 8,679 | - | 733 | 259 | 117 | - | 352 | 15,179 |
| 2015 | 75 | 4,492 | - | 473 | 8,785 | - | 760 | 259 | 117 | - | 352 | 15,313 |
| 2016 | 75 | 4,492 | - | 473 | 8,892 | - | 760 | 259 | 117 | - | 352 | 15,419 |
| 2017 | 75 | 4,492 | - | 473 | 8,998 | - | 788 | 259 | 117 | - | 352 | 15,552 |
| 2018 | 75 | 4,492 | - | 473 | 9,104 | - | 788 | 259 | 117 | - | 375 | 15,682 |
| 2019 | 75 | 4,492 | - | 473 | 9,210 | - | 815 | 259 | 117 | - | 398 | 15,839 |
| 2020 | 75 | 4,492 | - | 473 | 9,316 | - | 815 | 259 | 117 | - | 422 | 15,968 |
| 2021 | 75 | 4,492 | - | 473 | 9,423 | - | 842 | 259 | 117 | - | 445 | 16,125 |
| 2022 | 75 | 4,492 | - | 473 | 9,529 | - | 842 | 259 | 117 | - | 469 | 16,255 |
| 2023 | 75 | 4,492 | - | 473 | 9,635 | - | 869 | 259 | 117 | - | 469 | 16,388 |
| 2024 | 75 | 4,492 | - | 473 | 9,741 | - | 869 | 259 | 117 | - | 469 | 16,495 |
| 2025 | 75 | 4,492 | - | 473 | 9,848 | - | 897 | 259 | 117 | - | 469 | 16,628 |
| 2026 | 75 | 4,492 | - | 473 | 9,954 | - | 897 | 259 | 117 | - | 469 | 16,734 |
| 2027 | 75 | 4,492 | - | 473 | 10,060 | - | 924 | 259 | 117 | - | 469 | 16,868 |
| 2028 | 75 | 4,492 | - | 473 | 10,166 | - | 924 | 259 | 117 | - | 469 | 16,974 |
| 2029 | 75 | 4,492 | - | 473 | 10,272 | - | 951 | 259 | 117 | - | 469 | 17,107 |
| 2030 | 75 | 4,492 | - | 473 | 10,379 | - | 951 | 259 | 117 | - | 469 | 17,214 |
| 2031 | 75 | 4,492 | - | 473 | 10,485 | - | 978 | 259 | 117 | - | 469 | 17,347 |
| 2032 | 75 | 4,492 | - | 473 | 10,591 | - | 978 | 259 | 117 | - | 469 | 17,453 |
| 2033 | 75 | 4,492 | - | 473 | 10,697 | - | 1,006 | 259 | 117 | - | 469 | 17,587 |
| 2034 | 75 | 4,492 | - | 473 | 10,803 | - | 1,006 | 259 | 117 | - | 469 | 17,693 |
| 2035 | 75 | 4,492 | - | 473 | 10,910 | - | 1,033 | 259 | 117 | - | 469 | 17,827 |
| 2036 | 75 | 4,492 | - | 473 | 11,016 | - | 1,033 | 259 | 117 | - | 469 | 17,933 |
| 2037 | 75 | 4,492 | - | 473 | 11,122 | - | 1,060 | 259 | 117 | - | 469 | 18,066 |
| 2038 | 75 | 4,492 | - | 473 | 11,228 | - | 1,060 | 259 | 117 | - | 469 | 18,172 |
| 2039 | 75 | 4,492 | - | 473 | 11,335 | - | 1,087 | 259 | 117 | - | 469 | 18,306 |
| 2040 | 75 | 4,492 | - | 473 | 11,441 | - | 1,087 | 259 | 117 | - | 469 | 18,412 |
| 2041 | 75 | 4,492 | - | 473 | 11,547 | - | 1,115 | 259 | 117 | - | 469 | 18,546 |
| 2042 | 75 | 4,492 | - | 473 | 11,653 | - | 1,115 | 259 | 117 | - | 469 | 18,652 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | -- | 0.4% | -- | -1.2% | 6.3% | -- | 7.1% | -- | 3.1% | -- | -0.4% | 2.4% |
| 1997-2012 | -6.2% | 3.0% | -- | 0.6% | 5.9% | -- | 11.3% | 1.4% | -4.4% | -- | 13.4% | 4.2% |
| 2002-2012 | -2.8% | 2.7% | -- | -0.5% | 10.0% | -- | 14.7% | -3.7% | 2.7% | -- | 13.0% | 5.9% |
| 2007-2012 | -15.3% | 4.7% | -- | -12.3% | 12.9% | -- | 14.3% | -9.4% | 13.1% | -- | 20.5% | 7.6% |
| 2012-2017 | -4.0% | -7.4% | -- | 1.9% | 1.2% | -- | -2.5% | 1.6% | -15.1% | -- | -3.1% | -2.2% |
| 2012-2022 | -2.0% | -3.8% | -- | 1.0% | 1.2% | -- | -0.6% | 0.8% | -7.9% | -- | 1.3% | -0.7% |
| 2012-2032 | -1.0% | -1.9% | -- | 0.5% | 1.1% | -- | 0.4% | 0.4% | -4.0% | -- | 0.7% | 0.0% |
| 2012-2042 | -0.7% | -1.3% | -- | 0.3% | 1.1% | -- | 0.7% | 0.3% | -2.7% | -- | 0.4% | 0.2% |
| 2013-2042 | 0.0% | 0.0% | -- | 0.0% | 1.1% | -- | 1.5% | 0.0% | 0.0% | -- | 1.0% | 0.7% |

Minnkota members provided service to 8,408 general commercial customers in 2012. The largest contributors to this class include a diverse mix of retail, agriculture, small manufacturing, schools and offices. This class accounted for 7 percent of Minnkota's consumers and 14 percent of total energy sales in 2012. General commercial energy sales grew 2.8 percent during the 1983 to 2012 study period.

General Commercial Customers Forecast

The general commercial customer forecasts are shown in Table 3.6 by member system. A specific forecast model was developed for each member system, relating general commercial customer growth to a variety of economic and demographic variables. Detailed descriptions of the selected models and forecasts can be found in the individual forecast reports for each member system.

Given the forecasts of steadily increasing factors such as employment, population and income, general commercial customers are projected to grow throughout the forecast period at an average annual compound growth rate of 1.6 percent through 2042. This is slower than the historical growth of 2.1 percent per year from 1983 through 2012.

General Commercial Energy Use Per Customer Forecast

The forecast for general commercial energy use per customer is shown in Table 3.7. A separate econometric model was developed for each member system. Refer to each member system forecast report for the detailed models. The models relate energy sales per customer to a variety of economic and demographic variables including weather, employment and price. All variables were converted to natural logs before computation. As shown in Table 3.7, general commercial energy use per customer is expected to grow at 0.6 percent per year through 2042.

General Commercial Energy Sales Forecast

The total general commercial energy sales forecast is summarized in Table 3.8. Steady growth in this class' energy sales is projected throughout the forecast period at a slower rate than what has been experienced historically (2.1 percent over the 2013-2042 period versus 2.8 percent over the 1983-2012 period). Growth in customers will be the primary driver for this class.

Table 3.6

General Commercial Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | Nodak | North | | Red | Red | Roseau | Wild | Total |
|------|----------|--------|-------------|------|-------|-------|-----|------|-------|--------|------|--------|
| | Beltrami | County | Cavalier | Polk | | Star | PKM | Lake | River | | | |
| 1983 | 501 | 1,120 | 53 | 115 | 1,204 | 407 | 177 | 231 | 310 | 163 | 307 | 4,588 |
| 1984 | 505 | 1,150 | 54 | 113 | 1,228 | 397 | 177 | 231 | 314 | 156 | 319 | 4,647 |
| 1985 | 521 | 1,176 | 55 | 113 | 1,269 | 394 | 182 | 239 | 318 | 153 | 290 | 4,708 |
| 1986 | 531 | 1,187 | 52 | 118 | 1,337 | 378 | 183 | 243 | 326 | 150 | 295 | 4,800 |
| 1987 | 544 | 1,204 | 51 | 125 | 1,389 | 380 | 185 | 242 | 322 | 160 | 339 | 4,939 |
| 1988 | 571 | 1,211 | 53 | 131 | 1,404 | 389 | 189 | 242 | 328 | 170 | 300 | 4,989 |
| 1989 | 604 | 1,234 | 57 | 132 | 1,425 | 408 | 191 | 242 | 331 | 174 | 298 | 5,096 |
| 1990 | 621 | 1,251 | 60 | 132 | 1,485 | 417 | 198 | 242 | 332 | 177 | 311 | 5,225 |
| 1991 | 638 | 1,355 | 63 | 133 | 1,494 | 437 | 207 | 239 | 335 | 184 | 318 | 5,403 |
| 1992 | 657 | 1,421 | 64 | 131 | 1,516 | 437 | 206 | 239 | 335 | 188 | 376 | 5,570 |
| 1993 | 671 | 1,496 | 61 | 131 | 1,555 | 441 | 211 | 243 | 342 | 195 | 421 | 5,765 |
| 1994 | 675 | 1,523 | 60 | 132 | 1,611 | 436 | 216 | 238 | 348 | 209 | 473 | 5,921 |
| 1995 | 697 | 1,568 | 60 | 134 | 1,709 | 436 | 219 | 239 | 354 | 224 | 499 | 6,140 |
| 1996 | 724 | 1,592 | 59 | 136 | 1,726 | 440 | 218 | 243 | 364 | 227 | 518 | 6,245 |
| 1997 | 754 | 1,627 | 61 | 134 | 1,750 | 445 | 219 | 248 | 375 | 231 | 540 | 6,383 |
| 1998 | 791 | 1,712 | 62 | 141 | 1,816 | 444 | 215 | 271 | 402 | 245 | 548 | 6,649 |
| 1999 | 822 | 1,798 | 65 | 150 | 1,975 | 450 | 216 | 276 | 409 | 253 | 566 | 6,979 |
| 2000 | 859 | 1,834 | 65 | 156 | 1,935 | 458 | 219 | 286 | 415 | 253 | 585 | 7,066 |
| 2001 | 896 | 1,931 | 63 | 168 | 513 | 468 | 222 | 297 | 426 | 254 | 589 | 5,827 |
| 2002 | 977 | 2,009 | 63 | 198 | 410 | 481 | 222 | 305 | 437 | 262 | 584 | 5,950 |
| 2003 | 1,057 | 2,336 | 64 | 237 | 356 | 493 | 225 | 315 | 443 | 266 | 592 | 6,383 |
| 2004 | 1,116 | 2,487 | 63 | 256 | 322 | 508 | 231 | 325 | 449 | 281 | 601 | 6,639 |
| 2005 | 1,163 | 2,652 | 63 | 267 | 327 | 516 | 240 | 335 | 448 | 285 | 573 | 6,868 |
| 2006 | 1,223 | 2,869 | 63 | 275 | 311 | 526 | 243 | 338 | 446 | 290 | 595 | 7,180 |
| 2007 | 1,306 | 2,946 | 66 | 285 | 302 | 539 | 247 | 343 | 467 | 292 | 609 | 7,401 |
| 2008 | 1,316 | 3,153 | 72 | 287 | 302 | 548 | 249 | 353 | 494 | 291 | 623 | 7,686 |
| 2009 | 1,312 | 3,307 | 70 | 284 | 307 | 539 | 254 | 354 | 497 | 302 | 644 | 7,871 |
| 2010 | 1,324 | 3,478 | 72 | 285 | 302 | 549 | 260 | 352 | 503 | 303 | 654 | 8,082 |
| 2011 | 1,358 | 3,601 | 73 | 283 | 290 | 556 | 265 | 346 | 496 | 299 | 664 | 8,230 |
| 2012 | 1,355 | 3,765 | 74 | 263 | 292 | 563 | 263 | 352 | 508 | 301 | 673 | 8,408 |
| 2013 | 1,366 | 3,889 | 74 | 263 | 297 | 571 | 263 | 355 | 518 | 301 | 680 | 8,579 |
| 2014 | 1,395 | 4,014 | 74 | 243 | 302 | 580 | 264 | 358 | 525 | 302 | 689 | 8,747 |
| 2015 | 1,430 | 4,140 | 74 | 188 | 307 | 589 | 265 | 361 | 532 | 302 | 694 | 8,881 |
| 2016 | 1,457 | 4,266 | 74 | 189 | 312 | 597 | 266 | 366 | 538 | 303 | 699 | 9,066 |
| 2017 | 1,484 | 4,391 | 75 | 190 | 317 | 605 | 267 | 371 | 544 | 305 | 704 | 9,252 |
| 2018 | 1,512 | 4,515 | 75 | 191 | 322 | 613 | 268 | 376 | 549 | 306 | 709 | 9,436 |
| 2019 | 1,541 | 4,638 | 75 | 192 | 327 | 620 | 269 | 381 | 553 | 309 | 714 | 9,619 |
| 2020 | 1,570 | 4,759 | 75 | 193 | 332 | 628 | 270 | 386 | 558 | 311 | 719 | 9,801 |
| 2021 | 1,600 | 4,879 | 75 | 194 | 337 | 635 | 271 | 391 | 562 | 313 | 724 | 9,981 |
| 2022 | 1,630 | 4,996 | 75 | 195 | 342 | 641 | 273 | 396 | 566 | 316 | 729 | 10,160 |
| 2023 | 1,661 | 5,112 | 76 | 195 | 347 | 648 | 274 | 401 | 570 | 318 | 734 | 10,336 |
| 2024 | 1,693 | 5,226 | 76 | 196 | 352 | 654 | 275 | 406 | 574 | 320 | 739 | 10,511 |
| 2025 | 1,725 | 5,339 | 76 | 196 | 357 | 660 | 277 | 411 | 577 | 322 | 744 | 10,684 |
| 2026 | 1,758 | 5,449 | 76 | 197 | 362 | 666 | 278 | 416 | 580 | 324 | 749 | 10,856 |
| 2027 | 1,791 | 5,558 | 76 | 197 | 367 | 672 | 280 | 421 | 583 | 325 | 754 | 11,025 |
| 2028 | 1,825 | 5,665 | 77 | 197 | 372 | 678 | 281 | 426 | 587 | 327 | 759 | 11,194 |
| 2029 | 1,860 | 5,770 | 77 | 198 | 377 | 683 | 283 | 431 | 590 | 328 | 764 | 11,362 |
| 2030 | 1,896 | 5,874 | 77 | 198 | 382 | 689 | 284 | 436 | 593 | 330 | 769 | 11,527 |
| 2031 | 1,932 | 5,975 | 77 | 198 | 387 | 694 | 286 | 441 | 596 | 331 | 774 | 11,691 |
| 2032 | 1,969 | 6,075 | 77 | 198 | 392 | 700 | 287 | 446 | 599 | 332 | 779 | 11,854 |
| 2033 | 2,006 | 6,173 | 77 | 199 | 397 | 705 | 289 | 451 | 601 | 333 | 784 | 12,016 |
| 2034 | 2,045 | 6,269 | 77 | 199 | 402 | 711 | 291 | 456 | 605 | 334 | 789 | 12,177 |
| 2035 | 2,084 | 6,363 | 78 | 199 | 407 | 716 | 292 | 461 | 608 | 335 | 794 | 12,337 |
| 2036 | 2,123 | 6,455 | 78 | 199 | 412 | 722 | 294 | 466 | 611 | 336 | 799 | 12,495 |
| 2037 | 2,164 | 6,546 | 78 | 200 | 417 | 727 | 296 | 471 | 614 | 337 | 804 | 12,654 |
| 2038 | 2,205 | 6,635 | 78 | 200 | 422 | 733 | 297 | 476 | 617 | 338 | 809 | 12,811 |
| 2039 | 2,247 | 6,722 | 78 | 200 | 427 | 739 | 299 | 481 | 621 | 339 | 814 | 12,967 |
| 2040 | 2,290 | 6,807 | 78 | 200 | 432 | 745 | 301 | 486 | 625 | 340 | 819 | 13,122 |
| 2041 | 2,334 | 6,890 | 79 | 201 | 437 | 751 | 303 | 491 | 628 | 341 | 824 | 13,279 |
| 2042 | 2,378 | 6,971 | 79 | 201 | 442 | 757 | 305 | 496 | 632 | 343 | 829 | 13,433 |

| Average Annual Growth Rates | | | | | | | | | | | | |
|-----------------------------|------|------|------|-------|--------|------|------|------|------|------|------|------|
| 1983-2012 | 3.5% | 4.3% | 1.1% | 2.9% | -4.8% | 1.1% | 1.4% | 1.5% | 1.7% | 2.1% | 2.7% | 2.1% |
| 1997-2012 | 4.0% | 5.8% | 1.3% | 4.6% | -11.3% | 1.6% | 1.2% | 2.4% | 2.0% | 1.8% | 1.5% | 1.9% |
| 2002-2012 | 3.3% | 6.5% | 1.6% | 2.9% | -3.3% | 1.6% | 1.7% | 1.4% | 1.5% | 1.4% | 1.4% | 3.5% |
| 2007-2012 | 0.7% | 5.0% | 2.4% | -1.5% | -0.7% | 0.8% | 1.3% | 0.6% | 1.7% | 0.6% | 2.0% | 2.6% |
| 2012-2017 | 1.8% | 3.1% | 0.3% | -6.3% | 1.7% | 1.5% | 0.3% | 1.1% | 1.4% | 0.2% | 0.9% | 1.9% |
| 2012-2022 | 1.9% | 2.9% | 0.2% | -3.0% | 1.6% | 1.3% | 0.4% | 1.2% | 1.1% | 0.5% | 0.8% | 1.9% |
| 2012-2032 | 1.9% | 2.4% | 0.2% | -1.4% | 1.5% | 1.1% | 0.4% | 1.2% | 0.8% | 0.5% | 0.7% | 1.7% |
| 2012-2042 | 1.9% | 2.1% | 0.2% | -0.9% | 1.4% | 1.0% | 0.5% | 1.1% | 0.7% | 0.4% | 0.7% | 1.6% |
| 2013-2042 | 1.9% | 2.0% | 0.2% | -0.9% | 1.4% | 1.0% | 0.5% | 1.2% | 0.7% | 0.4% | 0.7% | 1.6% |

Table 3.7

Average General Commercial Energy Use Per Customer Forecasts By Member (kWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Wild | Minnkota | |
|------|----------|--------|-------------|--------|---------|--------|--------|--------|--------|--------|----------|----------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Roseau | Rice | Avg. Use |
| 1983 | 38,253 | 59,101 | 17,399 | 22,827 | 55,695 | 31,507 | 27,290 | 33,631 | 54,189 | 32,820 | 32,518 | 46,538 |
| 1984 | 40,871 | 62,081 | 16,448 | 23,538 | 60,195 | 33,018 | 27,824 | 31,846 | 53,969 | 34,770 | 34,296 | 49,136 |
| 1985 | 41,298 | 66,266 | 15,923 | 25,682 | 63,872 | 30,042 | 27,806 | 32,849 | 56,705 | 36,853 | 25,673 | 50,989 |
| 1986 | 41,532 | 65,570 | 16,735 | 29,210 | 68,571 | 31,943 | 28,460 | 34,086 | 53,312 | 34,458 | 26,222 | 52,445 |
| 1987 | 43,011 | 65,614 | 16,243 | 35,319 | 58,609 | 32,070 | 28,774 | 31,590 | 49,653 | 36,830 | 32,933 | 50,040 |
| 1988 | 45,938 | 71,467 | 16,784 | 36,322 | 61,385 | 35,636 | 30,971 | 34,599 | 49,790 | 46,972 | 26,373 | 53,111 |
| 1989 | 46,407 | 71,551 | 22,235 | 34,531 | 59,444 | 37,136 | 30,427 | 35,859 | 47,414 | 49,799 | 26,596 | 52,739 |
| 1990 | 48,302 | 71,326 | 36,157 | 29,172 | 56,886 | 38,103 | 33,651 | 37,177 | 50,747 | 49,277 | 27,503 | 52,701 |
| 1991 | 49,825 | 70,517 | 23,580 | 28,874 | 61,736 | 41,350 | 37,361 | 42,226 | 51,803 | 47,415 | 28,187 | 54,755 |
| 1992 | 47,070 | 69,088 | 25,944 | 29,075 | 67,383 | 40,347 | 45,365 | 39,625 | 51,259 | 49,616 | 43,563 | 56,747 |
| 1993 | 52,001 | 69,418 | 29,776 | 32,166 | 71,699 | 40,330 | 41,123 | 44,629 | 55,923 | 52,291 | 40,512 | 58,950 |
| 1994 | 53,448 | 76,087 | 21,079 | 35,277 | 70,104 | 42,278 | 38,751 | 47,254 | 55,961 | 49,443 | 38,933 | 60,310 |
| 1995 | 56,047 | 84,111 | 22,030 | 35,027 | 75,696 | 42,488 | 54,358 | 49,274 | 54,816 | 58,569 | 37,994 | 65,161 |
| 1996 | 56,378 | 76,737 | 25,085 | 33,993 | 77,705 | 42,239 | 36,067 | 48,004 | 54,545 | 52,932 | 42,390 | 63,259 |
| 1997 | 56,144 | 75,048 | 24,388 | 38,291 | 77,634 | 41,535 | 38,532 | 48,141 | 51,830 | 52,368 | 39,828 | 62,474 |
| 1998 | 54,289 | 75,547 | 23,805 | 36,934 | 73,074 | 40,713 | 40,826 | 45,452 | 45,168 | 46,233 | 41,658 | 60,649 |
| 1999 | 52,525 | 77,920 | 28,580 | 35,878 | 70,914 | 41,619 | 53,840 | 45,091 | 46,377 | 50,295 | 42,028 | 61,439 |
| 2000 | 54,100 | 77,251 | 28,350 | 36,682 | 45,401 | 43,093 | 50,294 | 43,353 | 40,448 | 49,248 | 39,726 | 53,670 |
| 2001 | 53,051 | 73,116 | 27,876 | 35,856 | 206,692 | 42,696 | 49,534 | 43,727 | 39,721 | 49,661 | 38,223 | 68,385 |
| 2002 | 50,569 | 75,798 | 27,774 | 33,031 | 256,929 | 43,431 | 48,660 | 42,307 | 40,820 | 50,976 | 41,332 | 69,804 |
| 2003 | 50,190 | 63,458 | 31,645 | 28,830 | 328,681 | 43,083 | 50,893 | 42,227 | 36,790 | 49,430 | 42,508 | 67,006 |
| 2004 | 49,019 | 60,416 | 31,467 | 27,521 | 359,114 | 42,436 | 54,069 | 38,875 | 37,675 | 47,178 | 42,307 | 65,069 |
| 2005 | 44,684 | 59,876 | 30,832 | 28,092 | 353,153 | 41,519 | 52,312 | 41,301 | 39,436 | 46,634 | 47,795 | 64,327 |
| 2006 | 43,334 | 56,835 | 30,150 | 27,003 | 364,131 | 40,488 | 48,521 | 38,779 | 37,109 | 45,069 | 44,837 | 61,428 |
| 2007 | 40,761 | 59,295 | 42,279 | 25,940 | 369,766 | 39,699 | 60,951 | 37,223 | 41,890 | 44,071 | 48,874 | 62,302 |
| 2008 | 43,303 | 61,167 | 66,412 | 25,016 | 355,117 | 40,717 | 61,568 | 37,201 | 41,642 | 46,355 | 47,053 | 62,849 |
| 2009 | 43,136 | 61,404 | 67,718 | 23,395 | 346,300 | 40,395 | 60,948 | 39,213 | 49,071 | 46,883 | 56,328 | 63,960 |
| 2010 | 42,908 | 57,758 | 76,392 | 22,580 | 349,066 | 38,383 | 74,959 | 40,581 | 51,534 | 44,800 | 51,445 | 62,255 |
| 2011 | 43,242 | 54,465 | 76,426 | 22,851 | 339,185 | 38,634 | 74,398 | 39,685 | 37,993 | 44,005 | 43,345 | 58,446 |
| 2012 | 42,598 | 51,775 | 71,771 | 23,344 | 343,430 | 37,129 | 50,573 | 36,928 | 40,221 | 52,362 | 42,856 | 56,683 |
| 2013 | 43,038 | 56,117 | 79,597 | 22,278 | 343,990 | 38,009 | 68,617 | 38,722 | 40,221 | 53,085 | 41,749 | 59,420 |
| 2014 | 43,038 | 55,990 | 80,020 | 23,928 | 338,488 | 38,174 | 68,723 | 38,722 | 40,221 | 52,244 | 40,267 | 59,173 |
| 2015 | 43,038 | 56,182 | 80,438 | 30,626 | 338,163 | 38,298 | 68,934 | 38,722 | 40,221 | 51,567 | 40,109 | 59,594 |
| 2016 | 43,038 | 56,289 | 80,987 | 30,602 | 344,542 | 38,311 | 69,037 | 38,722 | 40,221 | 51,383 | 40,046 | 59,859 |
| 2017 | 43,038 | 56,400 | 81,425 | 30,577 | 350,984 | 38,407 | 69,247 | 38,722 | 40,221 | 51,296 | 40,168 | 60,156 |
| 2018 | 43,038 | 56,548 | 81,859 | 30,549 | 357,497 | 38,569 | 69,504 | 38,722 | 40,221 | 51,329 | 40,483 | 60,493 |
| 2019 | 43,038 | 56,651 | 82,439 | 30,507 | 364,079 | 38,663 | 69,755 | 38,722 | 40,221 | 51,324 | 40,807 | 60,807 |
| 2020 | 43,038 | 56,819 | 82,884 | 30,476 | 370,733 | 38,719 | 69,873 | 38,722 | 40,221 | 51,281 | 41,075 | 61,141 |
| 2021 | 43,038 | 57,257 | 83,334 | 30,444 | 377,455 | 38,874 | 70,171 | 38,722 | 40,221 | 51,484 | 41,470 | 61,636 |
| 2022 | 43,038 | 57,861 | 83,936 | 30,410 | 384,246 | 39,112 | 70,233 | 38,722 | 40,221 | 51,801 | 41,927 | 62,225 |
| 2023 | 43,038 | 58,517 | 84,398 | 30,361 | 391,111 | 39,227 | 70,482 | 38,722 | 40,221 | 52,146 | 42,391 | 62,847 |
| 2024 | 43,038 | 59,012 | 85,016 | 30,310 | 398,044 | 39,389 | 70,746 | 38,722 | 40,221 | 52,324 | 42,755 | 63,379 |
| 2025 | 43,038 | 59,499 | 85,491 | 30,257 | 405,053 | 39,535 | 70,834 | 38,722 | 40,221 | 52,497 | 43,112 | 63,906 |
| 2026 | 43,038 | 59,770 | 86,116 | 30,215 | 412,127 | 39,646 | 70,924 | 38,722 | 40,221 | 52,494 | 43,360 | 64,311 |
| 2027 | 43,038 | 59,917 | 86,761 | 30,156 | 419,279 | 39,691 | 71,052 | 38,722 | 40,221 | 52,348 | 43,517 | 64,646 |
| 2028 | 43,038 | 60,001 | 87,257 | 30,095 | 426,504 | 39,745 | 71,302 | 38,722 | 40,221 | 52,105 | 43,612 | 64,947 |
| 2029 | 43,038 | 60,140 | 87,920 | 30,047 | 433,812 | 39,789 | 71,639 | 38,722 | 40,221 | 51,854 | 43,699 | 65,276 |
| 2030 | 43,038 | 60,280 | 88,583 | 29,981 | 441,198 | 39,845 | 71,705 | 38,722 | 40,221 | 51,596 | 43,784 | 65,604 |
| 2031 | 43,038 | 60,419 | 89,256 | 29,898 | 448,665 | 39,888 | 71,879 | 38,722 | 40,221 | 51,329 | 43,862 | 65,934 |
| 2032 | 43,038 | 60,558 | 89,794 | 29,826 | 456,220 | 39,928 | 72,097 | 38,722 | 40,221 | 51,055 | 43,940 | 66,266 |
| 2033 | 43,038 | 60,697 | 90,487 | 29,768 | 463,861 | 39,969 | 72,264 | 38,722 | 40,221 | 50,774 | 44,017 | 66,598 |
| 2034 | 43,038 | 60,836 | 91,191 | 29,690 | 471,596 | 40,013 | 72,381 | 38,722 | 40,221 | 50,485 | 44,096 | 66,933 |
| 2035 | 43,038 | 60,975 | 91,919 | 29,609 | 479,417 | 40,052 | 72,627 | 38,722 | 40,221 | 50,188 | 44,176 | 67,276 |
| 2036 | 43,038 | 61,114 | 92,647 | 29,525 | 487,337 | 40,080 | 72,749 | 38,722 | 40,221 | 49,883 | 44,254 | 67,614 |
| 2037 | 43,038 | 61,252 | 93,216 | 29,456 | 495,353 | 40,126 | 73,031 | 38,722 | 40,221 | 49,570 | 44,331 | 67,955 |
| 2038 | 43,038 | 61,388 | 93,966 | 29,365 | 503,475 | 40,158 | 73,197 | 38,722 | 40,221 | 49,250 | 44,405 | 68,298 |
| 2039 | 43,038 | 61,524 | 94,728 | 29,271 | 511,707 | 40,188 | 73,562 | 38,722 | 40,221 | 48,922 | 44,478 | 68,646 |
| 2040 | 43,038 | 61,658 | 95,517 | 29,172 | 520,046 | 40,226 | 73,663 | 38,722 | 40,221 | 48,587 | 44,549 | 68,990 |
| 2041 | 43,038 | 61,790 | 96,312 | 29,092 | 528,500 | 40,264 | 73,757 | 38,722 | 40,221 | 48,244 | 44,617 | 69,334 |
| 2042 | 43,038 | 61,919 | 97,114 | 28,987 | 537,071 | 40,302 | 73,844 | 38,722 | 40,221 | 47,893 | 44,683 | 69,680 |

| Average Annual Growth Rates | | | | | | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1983-2012 | 0.4% | -0.5% | 5.0% | 0.1% | 6.5% | 0.6% | 2.2% | 0.3% | -1.0% | 1.6% | 1.0% | 0.7% |
| 1997-2012 | -1.8% | -2.4% | 7.5% | -3.2% | 10.4% | -0.7% | 1.8% | -1.8% | -1.7% | 0.0% | 0.5% | -0.6% |
| 2002-2012 | -1.7% | -3.7% | 10.0% | -3.4% | 2.9% | -1.6% | 0.4% | -1.4% | -0.1% | 0.3% | 0.4% | -2.1% |
| 2007-2012 | 0.9% | -2.7% | 11.2% | -2.1% | -1.5% | -1.3% | -3.7% | -0.2% | -0.8% | 3.5% | -2.6% | -1.9% |
| 2012-2017 | 0.2% | 1.7% | 2.6% | 5.5% | 0.4% | 0.7% | 6.5% | 1.0% | 0.0% | -0.4% | -1.3% | 1.2% |
| 2012-2022 | 0.1% | 1.1% | 1.6% | 2.7% | 1.1% | 0.5% | 3.3% | 0.5% | 0.0% | -0.1% | -0.2% | 0.9% |
| 2012-2032 | 0.1% | 0.8% | 1.1% | 1.2% | 1.4% | 0.4% | 1.8% | 0.2% | 0.0% | -0.1% | 0.1% | 0.8% |
| 2012-2042 | 0.0% | 0.6% | 1.0% | 0.7% | 1.5% | 0.3% | 1.3% | 0.2% | 0.0% | -0.3% | 0.1% | 0.7% |
| 2013-2042 | 0.0% | 0.3% | 0.7% | 0.9% | 1.5% | 0.2% | 0.3% | 0.0% | 0.0% | -0.4% | 0.2% | 0.6% |

Table 3.8

General Commercial Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Roseau | Wild | Total Member Sales |
|------|----------|---------|-------------|-------|---------|--------|--------|--------|--------|--------|--------|--------------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Rice | | |
| 1983 | 19,171 | 66,198 | 927 | 2,619 | 67,066 | 12,818 | 4,842 | 7,766 | 16,803 | 5,336 | 9,986 | 213,532 |
| 1984 | 20,650 | 71,419 | 888 | 2,662 | 73,935 | 13,114 | 4,936 | 7,362 | 16,969 | 5,424 | 10,952 | 228,310 |
| 1985 | 21,506 | 77,895 | 869 | 2,904 | 81,027 | 11,834 | 5,051 | 7,865 | 18,032 | 5,629 | 7,434 | 240,047 |
| 1986 | 22,071 | 77,804 | 870 | 3,454 | 91,708 | 12,072 | 5,201 | 8,272 | 17,380 | 5,160 | 7,740 | 251,732 |
| 1987 | 23,380 | 78,966 | 831 | 4,403 | 81,403 | 12,181 | 5,326 | 7,640 | 15,968 | 5,905 | 11,153 | 247,156 |
| 1988 | 26,242 | 86,576 | 890 | 4,764 | 86,184 | 13,874 | 5,856 | 8,376 | 16,310 | 8,005 | 7,914 | 264,992 |
| 1989 | 28,034 | 88,258 | 1,275 | 4,558 | 84,723 | 15,158 | 5,817 | 8,660 | 15,678 | 8,665 | 7,937 | 268,762 |
| 1990 | 30,011 | 89,247 | 2,157 | 3,860 | 84,452 | 15,870 | 6,660 | 8,997 | 16,823 | 8,718 | 8,540 | 275,335 |
| 1991 | 31,776 | 95,563 | 1,486 | 3,838 | 92,254 | 18,080 | 7,721 | 10,071 | 17,350 | 8,728 | 8,975 | 295,841 |
| 1992 | 30,917 | 98,198 | 1,652 | 3,797 | 102,170 | 17,638 | 9,357 | 9,467 | 17,172 | 9,328 | 16,365 | 316,059 |
| 1993 | 34,867 | 103,820 | 1,801 | 4,219 | 111,498 | 17,799 | 8,680 | 10,830 | 19,126 | 10,192 | 17,035 | 339,869 |
| 1994 | 36,073 | 115,874 | 1,258 | 4,657 | 112,955 | 18,430 | 8,367 | 11,266 | 19,465 | 10,338 | 18,432 | 357,114 |
| 1995 | 39,079 | 131,899 | 1,322 | 4,708 | 129,383 | 18,532 | 11,913 | 11,752 | 19,428 | 13,115 | 18,940 | 400,070 |
| 1996 | 40,813 | 122,133 | 1,480 | 4,609 | 134,125 | 18,588 | 7,848 | 11,665 | 19,836 | 11,994 | 21,937 | 395,028 |
| 1997 | 42,352 | 122,065 | 1,482 | 5,137 | 135,886 | 18,479 | 8,445 | 11,931 | 19,410 | 12,080 | 21,497 | 398,764 |
| 1998 | 42,947 | 129,355 | 1,476 | 5,202 | 132,715 | 18,090 | 8,791 | 12,329 | 18,158 | 11,331 | 22,835 | 403,228 |
| 1999 | 43,180 | 140,075 | 1,870 | 5,382 | 140,032 | 18,739 | 11,612 | 12,445 | 18,945 | 12,741 | 23,770 | 428,790 |
| 2000 | 46,477 | 141,665 | 1,855 | 5,735 | 87,831 | 19,747 | 11,006 | 12,413 | 16,783 | 12,439 | 23,253 | 379,204 |
| 2001 | 47,507 | 141,187 | 1,752 | 6,021 | 105,929 | 19,999 | 11,005 | 12,998 | 16,918 | 12,635 | 22,504 | 398,454 |
| 2002 | 49,418 | 152,278 | 1,743 | 6,551 | 105,341 | 20,905 | 10,823 | 12,921 | 17,852 | 13,360 | 24,138 | 415,330 |
| 2003 | 53,055 | 148,239 | 2,020 | 6,828 | 116,983 | 21,240 | 11,468 | 13,308 | 16,280 | 13,128 | 25,165 | 427,713 |
| 2004 | 54,685 | 150,254 | 1,996 | 7,057 | 115,754 | 21,550 | 12,472 | 12,618 | 16,907 | 13,261 | 25,441 | 431,994 |
| 2005 | 51,952 | 158,791 | 1,932 | 7,510 | 115,481 | 21,403 | 12,572 | 13,843 | 17,648 | 13,287 | 27,394 | 441,813 |
| 2006 | 52,994 | 163,061 | 1,904 | 7,435 | 113,123 | 21,300 | 11,799 | 13,107 | 16,551 | 13,078 | 26,697 | 441,048 |
| 2007 | 53,223 | 174,707 | 2,769 | 7,384 | 111,608 | 21,414 | 15,024 | 12,761 | 19,552 | 12,876 | 29,748 | 461,068 |
| 2008 | 56,994 | 192,838 | 4,759 | 7,180 | 107,216 | 22,293 | 15,300 | 13,129 | 20,564 | 13,505 | 29,310 | 483,087 |
| 2009 | 56,577 | 203,057 | 4,729 | 6,654 | 106,401 | 21,780 | 15,506 | 13,888 | 24,368 | 14,167 | 36,285 | 503,411 |
| 2010 | 56,803 | 200,859 | 5,532 | 6,443 | 105,563 | 21,085 | 19,452 | 14,268 | 25,935 | 13,574 | 33,654 | 503,168 |
| 2011 | 58,711 | 196,120 | 5,585 | 6,455 | 98,448 | 21,461 | 19,715 | 13,741 | 18,835 | 13,161 | 28,792 | 481,026 |
| 2012 | 57,717 | 194,906 | 5,293 | 6,149 | 100,310 | 20,885 | 13,301 | 13,014 | 20,415 | 15,770 | 28,832 | 476,592 |
| 2013 | 58,805 | 218,210 | 5,890 | 5,859 | 102,194 | 21,716 | 18,073 | 13,762 | 20,850 | 15,996 | 28,378 | 509,732 |
| 2014 | 60,049 | 224,734 | 5,921 | 5,814 | 102,252 | 22,142 | 18,140 | 13,878 | 21,121 | 15,761 | 27,755 | 517,568 |
| 2015 | 61,531 | 232,596 | 5,952 | 5,758 | 103,844 | 22,542 | 18,247 | 13,995 | 21,386 | 15,588 | 27,816 | 529,254 |
| 2016 | 62,693 | 240,133 | 5,993 | 5,784 | 107,526 | 22,871 | 18,332 | 14,188 | 21,635 | 15,579 | 27,972 | 542,705 |
| 2017 | 63,878 | 247,670 | 6,107 | 5,810 | 111,291 | 23,240 | 18,455 | 14,382 | 21,863 | 15,622 | 28,258 | 556,576 |
| 2018 | 65,086 | 255,333 | 6,139 | 5,835 | 115,144 | 23,638 | 18,599 | 14,575 | 22,071 | 15,725 | 28,682 | 570,829 |
| 2019 | 66,319 | 262,750 | 6,183 | 5,857 | 119,084 | 23,986 | 18,748 | 14,769 | 22,262 | 15,839 | 29,116 | 584,913 |
| 2020 | 67,576 | 270,412 | 6,216 | 5,882 | 123,114 | 24,299 | 18,865 | 14,963 | 22,443 | 15,947 | 29,512 | 599,229 |
| 2021 | 68,858 | 279,336 | 6,250 | 5,906 | 127,234 | 24,669 | 19,037 | 15,156 | 22,620 | 16,134 | 30,004 | 615,203 |
| 2022 | 70,165 | 289,090 | 6,295 | 5,930 | 131,444 | 25,084 | 19,143 | 15,350 | 22,780 | 16,354 | 30,544 | 632,179 |
| 2023 | 71,498 | 299,159 | 6,414 | 5,920 | 135,748 | 25,411 | 19,307 | 15,544 | 22,928 | 16,578 | 31,094 | 649,601 |
| 2024 | 72,857 | 308,424 | 6,461 | 5,941 | 140,145 | 25,763 | 19,479 | 15,737 | 23,069 | 16,744 | 31,575 | 666,195 |
| 2025 | 74,243 | 317,657 | 6,497 | 5,930 | 144,638 | 26,099 | 19,602 | 15,931 | 23,204 | 16,901 | 32,054 | 682,757 |
| 2026 | 75,655 | 325,713 | 6,545 | 5,952 | 149,224 | 26,408 | 19,727 | 16,124 | 23,337 | 16,996 | 32,455 | 698,137 |
| 2027 | 77,096 | 333,034 | 6,594 | 5,941 | 153,910 | 26,669 | 19,863 | 16,318 | 23,464 | 17,037 | 32,790 | 712,716 |
| 2028 | 78,564 | 339,916 | 6,719 | 5,929 | 158,695 | 26,933 | 20,038 | 16,512 | 23,592 | 17,040 | 33,080 | 727,016 |
| 2029 | 80,061 | 347,029 | 6,770 | 5,949 | 163,583 | 27,188 | 20,244 | 16,705 | 23,715 | 17,034 | 33,364 | 741,642 |
| 2030 | 81,587 | 354,062 | 6,821 | 5,936 | 168,574 | 27,449 | 20,372 | 16,899 | 23,836 | 17,019 | 33,648 | 756,204 |
| 2031 | 83,142 | 361,011 | 6,873 | 5,920 | 173,671 | 27,700 | 20,534 | 17,092 | 23,956 | 16,996 | 33,928 | 770,822 |
| 2032 | 84,728 | 367,877 | 6,914 | 5,906 | 178,876 | 27,946 | 20,711 | 17,286 | 24,073 | 16,966 | 34,208 | 785,491 |
| 2033 | 86,344 | 374,660 | 6,967 | 5,924 | 184,192 | 28,193 | 20,875 | 17,480 | 24,192 | 16,928 | 34,487 | 800,243 |
| 2034 | 87,991 | 381,361 | 7,022 | 5,908 | 189,621 | 28,443 | 21,027 | 17,673 | 24,315 | 16,884 | 34,770 | 815,015 |
| 2035 | 89,670 | 387,979 | 7,170 | 5,892 | 195,162 | 28,690 | 21,219 | 17,867 | 24,435 | 16,835 | 35,054 | 829,972 |
| 2036 | 91,381 | 394,507 | 7,226 | 5,875 | 200,823 | 28,931 | 21,376 | 18,060 | 24,560 | 16,780 | 35,337 | 844,859 |
| 2037 | 93,125 | 400,945 | 7,271 | 5,891 | 206,604 | 29,187 | 21,586 | 18,254 | 24,689 | 16,722 | 35,620 | 859,893 |
| 2038 | 94,902 | 407,287 | 7,329 | 5,873 | 212,508 | 29,438 | 21,764 | 18,448 | 24,826 | 16,661 | 35,901 | 874,937 |
| 2039 | 96,714 | 413,534 | 7,389 | 5,854 | 218,542 | 29,694 | 22,007 | 18,641 | 24,968 | 16,599 | 36,183 | 890,123 |
| 2040 | 98,559 | 419,679 | 7,450 | 5,834 | 224,703 | 29,962 | 22,171 | 18,835 | 25,119 | 16,536 | 36,463 | 905,313 |
| 2041 | 100,442 | 425,722 | 7,609 | 5,847 | 230,998 | 30,236 | 22,333 | 19,028 | 25,271 | 16,471 | 36,742 | 920,700 |
| 2042 | 102,364 | 431,660 | 7,672 | 5,826 | 237,430 | 30,515 | 22,492 | 19,222 | 25,425 | 16,405 | 37,020 | 936,031 |

| Average Annual Growth Rates | | | | | | | | | | | | |
|-----------------------------|------|------|-------|-------|-------|-------|-------|------|------|-------|-------|------|
| 1983-2012 | 3.9% | 3.8% | 6.2% | 3.0% | 1.4% | 1.7% | 3.5% | 1.8% | 0.7% | 3.8% | 3.7% | 2.8% |
| 1997-2012 | 2.1% | 3.2% | 8.9% | 1.2% | -2.0% | 0.8% | 3.1% | 0.6% | 0.3% | 1.8% | 2.0% | 1.2% |
| 2002-2012 | 1.6% | 2.5% | 11.7% | -0.6% | -0.5% | 0.0% | 2.1% | 0.1% | 1.4% | 1.7% | 1.8% | 1.4% |
| 2007-2012 | 1.6% | 2.2% | 13.8% | -3.6% | -2.1% | -0.5% | -2.4% | 0.4% | 0.9% | 4.1% | -0.6% | 0.7% |
| 2012-2017 | 2.0% | 4.9% | 2.9% | -1.1% | 2.1% | 2.2% | 6.8% | 2.0% | 1.4% | -0.2% | -0.4% | 3.2% |
| 2012-2022 | 2.0% | 4.0% | 1.7% | -0.4% | 2.7% | 1.8% | 3.7% | 1.7% | 1.1% | 0.4% | 0.6% | 2.9% |
| 2012-2032 | 1.9% | 3.2% | 1.3% | -0.2% | 2.9% | 1.5% | 2.2% | 1.4% | 0.8% | 0.4% | 0.9% | 2.5% |
| 2012-2042 | 1.9% | 2.7% | 1.2% | -0.2% | 2.9% | 1.3% | 1.8% | 1.3% | 0.7% | 0.1% | 0.9% | 2.3% |
| 2013-2042 | 1.9% | 2.4% | 0.9% | 0.0% | 2.9% | 1.2% | 0.8% | 1.2% | 0.7% | 0.1% | 0.9% | 2.1% |

3.2.5 Large Commercial Class Forecast

Minnkota members served 217 customers that were classified as large (or intermediate) commercial for this forecast. This class includes a variety of larger loads including manufacturing, ethanol and biodiesel, pipeline pumping, agriculture and school loads.

Each of these loads was projected independently based on input from cooperative management and staff. Sales to this class were 876,814 MWh in 2012 and were projected to grow to 1,297,358 MWh by 2042 due to expected growth and expansion opportunities within the existing customer base. Much of this growth will come early in the forecast period due to a very large pipeline that will be served by both Cass County and Nodak. The forecast for this class is shown in Table 3.9.

3.2.6 Public Street and Highway Lighting Class Forecast

Table 3.10 shows that the member systems served 610 customers with energy sales of 9,558 MWh to this class in 2012. This class was projected based upon input from each member system. Energy sales are expected to grow at 1.6 percent per year over the projection horizon.

3.2.7 Public Authorities Class Forecast

Sales to public authorities generally include various federal, state and local government consumers. In the case of the North Dakota member systems, this historically included a number of Minuteman missile sites. These sites have now been deactivated. Public authority energy sales accounted for 3 percent of total cooperative energy sales in 2012. Sales to this class were projected judgmentally based on input from cooperative staff. The forecasts for the member systems energy sales are shown in Table 3.11. Stable to declining sales are expected from this class over the forecast horizon.

3.2.8 Sales for Resale – RUS Class Forecast

Table 3.12 shows that Beltrami Electric Cooperative, Inc. served one customer classified as Sales for Resale - RUS. This customer had energy sales of 7,069 MWh in 2012. Energy growth during 1983-2012 averaged 0.6 percent per year. The projection through 2042 was developed by holding the forecast steady at 2012 levels based on staff discussions.

Table 3.9

Large Commercial Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red Lake | Red River | Roseau | Wild Rice | Total Member Sales |
|------|----------|---------|-------------|-------|---------|--------|--------|----------|-----------|--------|-----------|--------------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | | | | | |
| 1983 | 2,987 | 26,758 | 10,848 | 426 | 42,403 | 10,287 | - | - | - | 3,112 | - | 96,821 |
| 1984 | 2,713 | 28,492 | 10,384 | 554 | 45,742 | 9,528 | - | - | - | 3,553 | - | 100,966 |
| 1985 | 2,905 | 27,914 | 6,630 | 334 | 53,157 | 7,423 | - | - | - | 4,208 | - | 102,570 |
| 1986 | 2,981 | 26,580 | 5,590 | 361 | 37,038 | 5,533 | - | - | - | 4,775 | - | 82,859 |
| 1987 | 2,829 | 29,629 | 5,627 | 388 | 23,706 | 3,096 | - | - | - | 6,307 | - | 71,582 |
| 1988 | 3,011 | 33,886 | 5,640 | 1,075 | 38,596 | 3,774 | - | - | - | 6,979 | - | 92,961 |
| 1989 | 3,356 | 34,397 | 5,621 | 659 | 32,334 | 3,871 | - | - | - | 8,017 | - | 88,255 |
| 1990 | 3,488 | 34,370 | 5,546 | 585 | 50,006 | 3,842 | - | - | - | 10,163 | - | 108,000 |
| 1991 | 3,262 | 32,804 | 5,560 | 1,188 | 49,686 | 4,136 | - | - | - | 10,386 | - | 107,022 |
| 1992 | 4,521 | 31,948 | 5,544 | 357 | 53,852 | 5,552 | - | - | - | 10,818 | - | 112,593 |
| 1993 | 6,083 | 34,694 | 5,455 | 632 | 60,524 | 6,392 | - | 992 | - | 12,341 | - | 127,112 |
| 1994 | 7,030 | 38,400 | 5,527 | 1,866 | 69,817 | 6,169 | - | 1,388 | - | 16,889 | - | 147,086 |
| 1995 | 7,783 | 36,037 | 5,485 | 2,064 | 75,252 | 7,828 | - | 1,716 | 278 | 18,684 | - | 155,126 |
| 1996 | 8,144 | 66,456 | 3,080 | 1,944 | 69,027 | 8,969 | 1,600 | 1,814 | 1,236 | 20,272 | - | 182,542 |
| 1997 | 7,715 | 67,707 | 650 | 2,428 | 71,022 | 8,885 | 1,600 | 1,814 | 1,894 | 21,146 | 925 | 185,786 |
| 1998 | 7,349 | 72,931 | 412 | 2,870 | 87,915 | 9,449 | 1,600 | 1,703 | 2,274 | 22,177 | 2,255 | 210,935 |
| 1999 | 9,581 | 75,631 | 333 | 2,607 | 101,784 | 10,021 | 1,600 | 2,218 | 3,758 | 28,015 | 6,039 | 241,587 |
| 2000 | 10,423 | 96,178 | 60 | 2,379 | 114,411 | 10,445 | 1,600 | 4,085 | 4,910 | 31,997 | 6,341 | 282,830 |
| 2001 | 11,726 | 117,022 | - | 1,155 | 152,812 | 10,107 | 1,600 | 7,182 | 5,042 | 30,522 | 6,936 | 344,104 |
| 2002 | 13,420 | 133,044 | - | 1,232 | 162,420 | 11,308 | 1,600 | 8,908 | 5,052 | 30,288 | 6,733 | 374,005 |
| 2003 | 12,586 | 144,861 | - | 1,682 | 154,511 | 12,871 | 1,600 | 8,616 | 6,405 | 30,872 | 5,734 | 379,738 |
| 2004 | 11,704 | 154,248 | - | 2,465 | 159,945 | 14,061 | 1,600 | 8,170 | 6,485 | 32,343 | 7,129 | 398,151 |
| 2005 | 15,404 | 166,934 | - | 2,014 | 164,941 | 14,296 | 1,567 | 7,840 | 6,728 | 32,830 | 6,952 | 419,506 |
| 2006 | 15,929 | 185,680 | - | 2,177 | 217,093 | 13,796 | 1,696 | 8,629 | 6,143 | 30,707 | 6,304 | 488,154 |
| 2007 | 17,076 | 201,648 | - | 2,205 | 228,144 | 13,610 | 1,649 | 11,095 | 8,839 | 31,239 | 6,608 | 522,111 |
| 2008 | 17,446 | 215,395 | - | 2,194 | 230,137 | 13,529 | 1,785 | 11,918 | 9,070 | 34,732 | 8,106 | 544,311 |
| 2009 | 17,479 | 217,181 | - | 2,227 | 227,257 | 12,446 | 1,328 | 10,458 | 10,011 | 30,521 | 8,857 | 537,765 |
| 2010 | 18,877 | 231,122 | - | 2,289 | 264,788 | 10,790 | 1,635 | 11,719 | 9,467 | 35,037 | 8,871 | 594,596 |
| 2011 | 18,697 | 289,386 | - | 1,941 | 399,677 | 11,197 | 1,585 | 12,037 | 10,878 | 39,693 | 10,938 | 796,029 |
| 2012 | 18,126 | 307,605 | - | 1,892 | 451,585 | 12,092 | 11,157 | 11,742 | 9,796 | 41,430 | 11,388 | 876,814 |
| 2013 | 18,126 | 317,573 | - | 1,960 | 449,242 | 12,483 | 16,950 | 11,878 | 9,828 | 41,795 | 11,417 | 891,253 |
| 2014 | 18,126 | 334,803 | 2,819 | 1,960 | 475,822 | 14,508 | 16,950 | 11,887 | 9,860 | 42,164 | 11,448 | 940,347 |
| 2015 | 18,126 | 342,901 | 4,208 | 1,960 | 485,260 | 16,533 | 16,950 | 11,896 | 10,892 | 42,536 | 11,480 | 962,741 |
| 2016 | 18,126 | 357,680 | 4,208 | 1,960 | 502,122 | 20,558 | 16,950 | 11,904 | 10,925 | 42,912 | 12,512 | 999,856 |
| 2017 | 18,126 | 378,588 | 4,208 | 1,960 | 502,579 | 21,582 | 16,950 | 11,913 | 10,957 | 43,291 | 12,546 | 1,022,702 |
| 2018 | 18,126 | 403,427 | 4,208 | 1,960 | 503,039 | 21,607 | 16,950 | 11,922 | 11,990 | 43,674 | 12,581 | 1,049,485 |
| 2019 | 18,126 | 409,196 | 4,208 | 1,960 | 513,501 | 21,632 | 16,950 | 11,931 | 12,023 | 44,061 | 12,618 | 1,066,206 |
| 2020 | 20,126 | 418,894 | 4,208 | 1,960 | 519,966 | 21,658 | 16,950 | 11,940 | 12,056 | 44,452 | 12,655 | 1,084,865 |
| 2021 | 20,126 | 424,522 | 4,208 | 1,960 | 520,434 | 21,683 | 16,950 | 11,949 | 12,090 | 44,847 | 12,694 | 1,091,462 |
| 2022 | 20,126 | 434,079 | 4,208 | 1,960 | 520,905 | 21,708 | 16,950 | 13,957 | 13,123 | 45,245 | 12,734 | 1,104,996 |
| 2023 | 20,126 | 439,565 | 4,208 | 1,960 | 527,379 | 21,734 | 16,950 | 13,966 | 13,157 | 45,648 | 12,775 | 1,117,468 |
| 2024 | 20,126 | 448,979 | 4,208 | 1,960 | 527,856 | 21,759 | 16,950 | 13,975 | 13,191 | 46,054 | 12,818 | 1,127,876 |
| 2025 | 20,126 | 454,322 | 4,208 | 1,960 | 528,336 | 21,785 | 16,950 | 13,984 | 13,225 | 46,465 | 12,862 | 1,134,222 |
| 2026 | 20,126 | 463,593 | 4,208 | 1,960 | 534,819 | 21,810 | 16,950 | 13,993 | 14,260 | 46,879 | 12,907 | 1,151,505 |
| 2027 | 20,126 | 468,792 | 4,208 | 1,960 | 535,304 | 21,836 | 16,950 | 14,002 | 14,295 | 47,297 | 12,954 | 1,157,725 |
| 2028 | 20,126 | 477,919 | 4,208 | 1,960 | 535,793 | 21,862 | 16,950 | 14,011 | 14,329 | 47,720 | 13,002 | 1,167,881 |
| 2029 | 20,126 | 482,974 | 4,208 | 1,960 | 542,285 | 21,888 | 16,950 | 14,020 | 14,365 | 48,147 | 13,052 | 1,179,974 |
| 2030 | 20,126 | 491,956 | 4,208 | 1,960 | 542,780 | 21,914 | 16,950 | 14,029 | 15,400 | 48,578 | 13,104 | 1,191,004 |
| 2031 | 20,126 | 496,865 | 4,208 | 1,960 | 543,278 | 21,940 | 16,950 | 14,037 | 15,436 | 49,013 | 13,156 | 1,196,970 |
| 2032 | 20,126 | 505,701 | 4,208 | 1,960 | 543,780 | 21,966 | 16,950 | 16,046 | 15,471 | 49,453 | 13,211 | 1,208,872 |
| 2033 | 20,126 | 510,463 | 4,208 | 1,960 | 550,284 | 21,993 | 16,950 | 16,055 | 15,507 | 49,897 | 13,267 | 1,220,710 |
| 2034 | 20,126 | 519,152 | 4,208 | 1,960 | 550,792 | 22,019 | 16,950 | 16,064 | 16,544 | 50,345 | 13,325 | 1,231,484 |
| 2035 | 20,126 | 523,767 | 4,208 | 1,960 | 551,302 | 22,046 | 16,950 | 16,073 | 16,580 | 50,797 | 13,385 | 1,237,194 |
| 2036 | 20,126 | 532,308 | 4,208 | 1,960 | 551,817 | 22,072 | 16,950 | 16,082 | 16,617 | 51,254 | 13,446 | 1,246,840 |
| 2037 | 20,126 | 536,774 | 4,208 | 1,960 | 558,334 | 22,099 | 16,950 | 16,091 | 16,654 | 51,716 | 13,509 | 1,258,421 |
| 2038 | 20,126 | 545,166 | 4,208 | 1,960 | 558,855 | 22,126 | 16,950 | 16,100 | 16,691 | 52,182 | 13,574 | 1,267,938 |
| 2039 | 20,126 | 549,483 | 4,208 | 1,960 | 559,379 | 22,153 | 16,950 | 16,109 | 16,728 | 52,653 | 13,641 | 1,273,390 |
| 2040 | 20,126 | 557,726 | 4,208 | 1,960 | 559,906 | 22,180 | 16,950 | 16,118 | 16,766 | 53,128 | 13,710 | 1,282,777 |
| 2041 | 20,126 | 561,893 | 4,208 | 1,960 | 560,437 | 22,207 | 16,950 | 16,127 | 16,804 | 53,608 | 13,780 | 1,288,100 |
| 2042 | 20,126 | 569,984 | 4,208 | 1,960 | 560,971 | 22,234 | 16,950 | 16,136 | 16,842 | 54,093 | 13,853 | 1,297,358 |

| Average Annual Growth Rates | | | | | | | | | | | | |
|-----------------------------|------|-------|---------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| 1983-2012 | 6.4% | 8.8% | -100.0% | 5.3% | 8.5% | 0.6% | -- | -- | -- | 9.3% | -- | 7.9% |
| 1997-2012 | 5.9% | 10.6% | -100.0% | -1.7% | 13.1% | 2.1% | 13.8% | 13.3% | 11.6% | 4.6% | 18.2% | 10.9% |
| 2002-2012 | 3.1% | 8.7% | -- | 4.4% | 10.8% | 0.7% | 21.4% | 2.8% | 6.8% | 3.2% | 5.4% | 8.9% |
| 2007-2012 | 1.2% | 8.8% | -- | -3.0% | 14.6% | -2.3% | 46.6% | 1.1% | 2.1% | 5.8% | 11.5% | 10.9% |
| 2012-2017 | 0.0% | 4.2% | -- | 0.7% | 2.2% | 12.3% | 8.7% | 0.3% | 2.3% | 0.9% | 2.0% | 3.1% |
| 2012-2022 | 1.1% | 3.5% | -- | 0.4% | 1.4% | 6.0% | 4.3% | 1.7% | 3.0% | 0.9% | 1.1% | 2.3% |
| 2012-2032 | 0.5% | 2.5% | -- | 0.2% | 0.9% | 3.0% | 2.1% | 1.6% | 2.3% | 0.9% | 0.7% | 1.6% |
| 2012-2042 | 0.3% | 2.1% | -- | 0.1% | 0.7% | 2.1% | 1.4% | 1.1% | 1.8% | 0.9% | 0.7% | 1.3% |
| 2013-2042 | 0.4% | 2.0% | -- | 0.0% | 0.8% | 2.0% | 0.0% | 1.1% | 1.9% | 0.9% | 0.7% | 1.3% |

Table 3.10

Street Lighting Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| <u>Year</u> | <u>Beltrami</u> | <u>Cass County</u> | <u>Clearwater- Cavalier</u> | <u>Polk</u> | <u>Nodak</u> | <u>North Star</u> | <u>PKM</u> | <u>Red Lake</u> | <u>Red River</u> | <u>Roseau</u> | <u>Wild Rice</u> | <u>Total Member Sales</u> |
|------------------------------------|-----------------|--------------------|---------------------------------|-------------|--------------|-------------------|------------|-----------------|------------------|---------------|------------------|---------------------------|
| 1983 | 308 | 742 | 11 | - | 463 | 226 | - | 25 | 123 | 33 | 366 | 2,297 |
| 1984 | 323 | 766 | - | - | 426 | 219 | - | 26 | 118 | 34 | 378 | 2,291 |
| 1985 | 317 | 795 | - | - | 437 | 174 | - | 26 | 116 | 34 | 372 | 2,272 |
| 1986 | 345 | 893 | - | - | 495 | 165 | - | 26 | 115 | 34 | 367 | 2,440 |
| 1987 | 354 | 1,022 | - | - | 447 | 159 | - | 26 | 112 | 34 | 364 | 2,517 |
| 1988 | 357 | 1,055 | - | - | 393 | 162 | - | 26 | 122 | 35 | 365 | 2,514 |
| 1989 | 351 | 1,164 | - | - | 356 | 142 | - | 25 | 118 | 36 | 343 | 2,536 |
| 1990 | 341 | 1,279 | - | - | 370 | 135 | - | 25 | 127 | 37 | 373 | 2,687 |
| 1991 | 359 | 1,413 | - | - | 476 | 125 | - | 27 | 123 | 40 | 434 | 2,997 |
| 1992 | 350 | 1,551 | - | - | 211 | 128 | - | 25 | 123 | 43 | 473 | 2,906 |
| 1993 | 331 | 1,639 | - | - | 263 | 127 | - | 25 | 123 | 47 | 604 | 3,160 |
| 1994 | 299 | 1,849 | - | - | 277 | 127 | - | 24 | 123 | 48 | 586 | 3,331 |
| 1995 | 326 | 2,045 | - | - | 284 | 125 | - | 24 | 122 | 49 | 548 | 3,524 |
| 1996 | 310 | 2,185 | - | - | 283 | 128 | - | 25 | 121 | 53 | 571 | 3,676 |
| 1997 | 300 | 2,317 | - | - | 287 | 127 | - | 25 | 114 | 65 | 587 | 3,821 |
| 1998 | 300 | 2,461 | - | - | 272 | 130 | - | 26 | 112 | 98 | 613 | 4,010 |
| 1999 | 299 | 2,641 | - | - | 401 | 132 | - | 26 | 146 | 98 | 640 | 4,383 |
| 2000 | 310 | 2,986 | - | - | 370 | 136 | - | 26 | 149 | - | 647 | 4,623 |
| 2001 | 308 | 3,480 | - | - | 186 | 137 | - | 28 | 150 | 93 | 661 | 5,042 |
| 2002 | 322 | 3,734 | - | - | 899 | 137 | - | 26 | 162 | 102 | 666 | 6,049 |
| 2003 | 330 | 4,105 | - | - | - | 153 | - | 24 | 170 | 103 | 622 | 5,508 |
| 2004 | 298 | 4,613 | - | - | - | 154 | - | 16 | 174 | 104 | 590 | 5,951 |
| 2005 | 338 | 5,186 | - | - | - | 152 | - | 12 | 54 | 104 | 622 | 6,468 |
| 2006 | 399 | 5,459 | - | - | - | 151 | - | 13 | 88 | 105 | 599 | 6,815 |
| 2007 | 370 | 5,834 | - | - | - | 158 | - | 13 | 183 | 88 | 576 | 7,222 |
| 2008 | 378 | 6,151 | - | - | - | 162 | - | 13 | 198 | 111 | 576 | 7,587 |
| 2009 | 366 | 6,645 | - | - | - | 158 | - | 12 | 203 | 113 | 569 | 8,066 |
| 2010 | 354 | 7,261 | - | - | - | 157 | - | 12 | 221 | 113 | 567 | 8,684 |
| 2011 | 376 | 7,834 | - | - | - | 158 | - | 11 | 198 | 114 | 556 | 9,247 |
| 2012 | 424 | 8,171 | - | - | - | 152 | - | 24 | 199 | 83 | 505 | 9,558 |
| 2013 | 435 | 8,312 | - | - | - | 152 | - | 26 | 210 | 82 | 503 | 9,719 |
| 2014 | 445 | 8,456 | - | - | - | 152 | - | 26 | 210 | 82 | 500 | 9,871 |
| 2015 | 456 | 8,599 | - | - | - | 152 | - | 26 | 210 | 81 | 498 | 10,021 |
| 2016 | 466 | 8,741 | - | - | - | 152 | - | 26 | 210 | 81 | 495 | 10,171 |
| 2017 | 476 | 8,900 | - | - | - | 152 | - | 26 | 210 | 81 | 493 | 10,338 |
| 2018 | 487 | 9,060 | - | - | - | 152 | - | 26 | 210 | 80 | 490 | 10,504 |
| 2019 | 497 | 9,218 | - | - | - | 152 | - | 26 | 210 | 80 | 488 | 10,670 |
| 2020 | 506 | 9,375 | - | - | - | 152 | - | 26 | 210 | 79 | 485 | 10,834 |
| 2021 | 516 | 9,532 | - | - | - | 152 | - | 26 | 210 | 79 | 483 | 10,998 |
| 2022 | 526 | 9,705 | - | - | - | 152 | - | 26 | 210 | 79 | 480 | 11,178 |
| 2023 | 536 | 9,877 | - | - | - | 152 | - | 26 | 210 | 78 | 478 | 11,357 |
| 2024 | 545 | 10,049 | - | - | - | 152 | - | 26 | 210 | 78 | 476 | 11,536 |
| 2025 | 554 | 10,219 | - | - | - | 152 | - | 26 | 210 | 77 | 473 | 11,713 |
| 2026 | 564 | 10,389 | - | - | - | 152 | - | 26 | 210 | 77 | 471 | 11,889 |
| 2027 | 573 | 10,576 | - | - | - | 152 | - | 26 | 210 | 77 | 468 | 12,082 |
| 2028 | 582 | 10,762 | - | - | - | 152 | - | 26 | 210 | 76 | 466 | 12,274 |
| 2029 | 591 | 10,946 | - | - | - | 152 | - | 26 | 210 | 76 | 464 | 12,465 |
| 2030 | 600 | 11,130 | - | - | - | 152 | - | 26 | 210 | 76 | 462 | 12,655 |
| 2031 | 608 | 11,330 | - | - | - | 152 | - | 26 | 210 | 75 | 459 | 12,861 |
| 2032 | 617 | 11,529 | - | - | - | 152 | - | 26 | 210 | 75 | 457 | 13,066 |
| 2033 | 626 | 11,727 | - | - | - | 152 | - | 26 | 210 | 74 | 455 | 13,270 |
| 2034 | 634 | 11,924 | - | - | - | 152 | - | 26 | 210 | 74 | 452 | 13,472 |
| 2035 | 642 | 12,137 | - | - | - | 152 | - | 26 | 210 | 74 | 450 | 13,691 |
| 2036 | 651 | 12,349 | - | - | - | 152 | - | 26 | 210 | 73 | 448 | 13,909 |
| 2037 | 659 | 12,560 | - | - | - | 152 | - | 26 | 210 | 73 | 446 | 14,126 |
| 2038 | 667 | 12,788 | - | - | - | 152 | - | 26 | 210 | 73 | 443 | 14,358 |
| 2039 | 675 | 13,014 | - | - | - | 152 | - | 26 | 210 | 72 | 441 | 14,590 |
| 2040 | 683 | 13,238 | - | - | - | 152 | - | 26 | 210 | 72 | 439 | 14,820 |
| 2041 | 690 | 13,462 | - | - | - | 152 | - | 26 | 210 | 72 | 437 | 15,048 |
| 2042 | 698 | 13,701 | - | - | - | 152 | - | 26 | 210 | 71 | 435 | 15,293 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | 1.1% | 8.6% | -100.0% | -- | -100.0% | -1.4% | -- | -0.1% | 1.7% | 3.2% | 1.1% | 5.0% |
| 1997-2012 | 2.3% | 8.8% | -- | -- | -100.0% | 1.2% | -- | -0.1% | 3.8% | 1.6% | -1.0% | 6.3% |
| 2002-2012 | 2.8% | 8.1% | -- | -- | -100.0% | 1.0% | -- | -0.8% | 2.1% | -2.1% | -2.7% | 4.7% |
| 2007-2012 | 2.8% | 7.0% | -- | -- | -- | -0.9% | -- | 14.0% | 1.7% | -1.3% | -2.6% | 5.8% |
| 2012-2017 | 2.4% | 1.7% | -- | -- | -- | 0.1% | -- | 1.2% | 1.1% | -0.5% | -0.5% | 1.6% |
| 2012-2022 | 2.2% | 1.7% | -- | -- | -- | 0.1% | -- | 0.6% | 0.5% | -0.5% | -0.5% | 1.6% |
| 2012-2032 | 1.9% | 1.7% | -- | -- | -- | 0.0% | -- | 0.3% | 0.3% | -0.5% | -0.5% | 1.6% |
| 2012-2042 | 1.7% | 1.7% | -- | -- | -- | 0.0% | -- | 0.2% | 0.2% | -0.5% | -0.5% | 1.6% |
| 2013-2042 | 1.6% | 1.7% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | -0.5% | -0.5% | 1.6% |

Table 3.11

Public Authority Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | PKM | Red | Red | Roseau | Wild | Total Member Sales |
|-----------------------------|----------|---------|-------------|------|---------|-------|-----|------|-------|--------|------|--------------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | | Lake | River | | Rice | |
| 1983 | - | 3,732 | 298 | - | 112,668 | - | - | - | - | - | - | 116,698 |
| 1984 | - | 3,238 | 288 | - | 110,521 | - | - | - | - | - | - | 114,047 |
| 1985 | - | 2,055 | 259 | - | 110,778 | - | - | - | - | - | - | 113,092 |
| 1986 | - | 1,927 | 261 | - | 106,684 | - | - | - | - | - | - | 108,873 |
| 1987 | - | 1,830 | 279 | - | 107,885 | - | - | - | - | - | - | 109,994 |
| 1988 | - | 1,804 | 360 | - | 118,013 | - | - | - | - | - | - | 120,178 |
| 1989 | - | 1,835 | 348 | - | 120,601 | - | - | - | - | - | - | 122,784 |
| 1990 | - | 1,894 | 451 | - | 117,982 | - | - | - | - | - | - | 120,326 |
| 1991 | - | 1,893 | 529 | - | 122,672 | - | - | - | - | - | - | 125,094 |
| 1992 | - | 1,876 | 492 | - | 119,496 | - | - | - | - | - | - | 121,864 |
| 1993 | - | 1,843 | 488 | - | 119,234 | - | - | - | - | - | - | 121,565 |
| 1994 | - | 1,835 | 544 | - | 117,637 | - | - | - | - | - | - | 120,015 |
| 1995 | - | 1,844 | 554 | - | 118,400 | - | - | - | - | - | - | 120,798 |
| 1996 | - | 1,888 | 621 | - | 119,784 | - | - | - | - | - | - | 122,293 |
| 1997 | - | 1,649 | 658 | - | 104,800 | - | - | - | - | - | - | 107,107 |
| 1998 | - | 1,628 | 754 | - | 90,398 | - | - | - | - | - | - | 92,781 |
| 1999 | - | 833 | 656 | - | 85,480 | - | - | - | - | - | - | 86,970 |
| 2000 | - | 96 | 704 | - | 69,512 | - | - | - | - | - | - | 70,312 |
| 2001 | - | - | 752 | - | 66,341 | - | - | - | - | - | - | 67,092 |
| 2002 | - | - | 802 | - | 67,483 | - | - | - | - | - | - | 68,285 |
| 2003 | - | - | 806 | - | 66,070 | - | - | - | - | - | - | 66,876 |
| 2004 | - | - | 821 | - | 65,363 | - | - | - | - | - | - | 66,184 |
| 2005 | - | - | 776 | - | 63,326 | - | - | - | - | - | - | 64,102 |
| 2006 | - | - | 804 | - | 63,675 | - | - | - | - | - | - | 64,479 |
| 2007 | - | - | 832 | - | 105,248 | - | - | - | - | - | - | 106,080 |
| 2008 | - | - | 937 | - | 104,920 | - | - | - | - | - | - | 105,857 |
| 2009 | - | - | 909 | - | 102,995 | - | - | - | - | - | - | 103,905 |
| 2010 | - | - | 954 | - | 98,124 | - | - | - | - | - | - | 99,078 |
| 2011 | - | - | 965 | - | 89,686 | - | - | - | - | - | - | 90,651 |
| 2012 | - | - | 936 | - | 92,845 | - | - | - | - | - | - | 93,782 |
| 2013 | - | - | 941 | - | 92,381 | - | - | - | - | - | - | 93,322 |
| 2014 | - | - | 946 | - | 91,919 | - | - | - | - | - | - | 92,865 |
| 2015 | - | - | 950 | - | 91,460 | - | - | - | - | - | - | 92,410 |
| 2016 | - | - | 955 | - | 91,002 | - | - | - | - | - | - | 91,957 |
| 2017 | - | - | 960 | - | 90,547 | - | - | - | - | - | - | 91,507 |
| 2018 | - | - | 965 | - | 90,094 | - | - | - | - | - | - | 91,059 |
| 2019 | - | - | 970 | - | 89,644 | - | - | - | - | - | - | 90,614 |
| 2020 | - | - | 974 | - | 89,196 | - | - | - | - | - | - | 90,170 |
| 2021 | - | - | 979 | - | 88,750 | - | - | - | - | - | - | 89,729 |
| 2022 | - | - | 984 | - | 88,306 | - | - | - | - | - | - | 89,290 |
| 2023 | - | - | 989 | - | 87,865 | - | - | - | - | - | - | 88,854 |
| 2024 | - | - | 994 | - | 87,425 | - | - | - | - | - | - | 88,419 |
| 2025 | - | - | 999 | - | 86,988 | - | - | - | - | - | - | 87,987 |
| 2026 | - | - | 1,004 | - | 86,553 | - | - | - | - | - | - | 87,557 |
| 2027 | - | - | 1,009 | - | 86,120 | - | - | - | - | - | - | 87,129 |
| 2028 | - | - | 1,014 | - | 85,690 | - | - | - | - | - | - | 86,704 |
| 2029 | - | - | 1,019 | - | 85,261 | - | - | - | - | - | - | 86,280 |
| 2030 | - | - | 1,024 | - | 84,835 | - | - | - | - | - | - | 85,859 |
| 2031 | - | - | 1,029 | - | 84,411 | - | - | - | - | - | - | 85,440 |
| 2032 | - | - | 1,035 | - | 83,989 | - | - | - | - | - | - | 85,023 |
| 2033 | - | - | 1,040 | - | 83,569 | - | - | - | - | - | - | 84,609 |
| 2034 | - | - | 1,045 | - | 83,151 | - | - | - | - | - | - | 84,196 |
| 2035 | - | - | 1,050 | - | 82,735 | - | - | - | - | - | - | 83,785 |
| 2036 | - | - | 1,055 | - | 82,322 | - | - | - | - | - | - | 83,377 |
| 2037 | - | - | 1,061 | - | 81,910 | - | - | - | - | - | - | 82,971 |
| 2038 | - | - | 1,066 | - | 81,500 | - | - | - | - | - | - | 82,566 |
| 2039 | - | - | 1,071 | - | 81,093 | - | - | - | - | - | - | 82,164 |
| 2040 | - | - | 1,077 | - | 80,687 | - | - | - | - | - | - | 81,764 |
| 2041 | - | - | 1,082 | - | 80,284 | - | - | - | - | - | - | 81,366 |
| 2042 | - | - | 1,087 | - | 79,883 | - | - | - | - | - | - | 80,970 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | -- | -100.0% | 4.0% | -- | -0.7% | -- | -- | -- | -- | -- | -- | -0.8% |
| 1997-2012 | -- | -100.0% | 2.4% | -- | -0.8% | -- | -- | -- | -- | -- | -- | -0.9% |
| 2002-2012 | -- | -- | 1.6% | -- | 3.2% | -- | -- | -- | -- | -- | -- | 3.2% |
| 2007-2012 | -- | -- | 2.4% | -- | -2.5% | -- | -- | -- | -- | -- | -- | -2.4% |
| 2012-2017 | -- | -- | 0.5% | -- | -0.5% | -- | -- | -- | -- | -- | -- | -0.5% |
| 2012-2022 | -- | -- | 0.5% | -- | -0.5% | -- | -- | -- | -- | -- | -- | -0.5% |
| 2012-2032 | -- | -- | 0.5% | -- | -0.5% | -- | -- | -- | -- | -- | -- | -0.5% |
| 2012-2042 | -- | -- | 0.5% | -- | -0.5% | -- | -- | -- | -- | -- | -- | -0.5% |
| 2013-2042 | -- | -- | 0.5% | -- | -0.5% | -- | -- | -- | -- | -- | -- | -0.5% |

Table 3.12

Resale-RUS Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Beltrami | Cass County | Cavalier | Clearwater- Polk | Nodak | North Star | PKM | Red Lake | Red River | Roseau | Wild Rice | Total Member Sales |
|-----------------------------|----------|----------------|----------|---------------------|-------|---------------|-----|-------------|--------------|--------|--------------|--------------------------|
| 1983 | 5,998 | - | - | - | - | - | - | - | - | - | - | 5,998 |
| 1984 | 6,143 | - | - | - | - | - | - | - | - | - | - | 6,143 |
| 1985 | 6,010 | - | 1 | - | - | - | - | - | - | - | - | 6,011 |
| 1986 | 5,339 | - | - | - | - | - | - | - | - | - | - | 5,339 |
| 1987 | 5,389 | - | - | - | - | - | - | - | - | - | - | 5,389 |
| 1988 | 5,157 | - | 556 | - | - | - | - | - | - | - | - | 5,713 |
| 1989 | 5,387 | - | - | - | - | - | - | - | - | - | - | 5,387 |
| 1990 | 5,410 | - | - | - | - | - | - | - | - | - | - | 5,410 |
| 1991 | 5,103 | - | - | - | - | - | - | - | - | - | - | 5,103 |
| 1992 | 5,378 | - | - | - | - | - | - | - | - | - | - | 5,378 |
| 1993 | 5,651 | - | - | - | - | - | - | - | - | - | - | 5,651 |
| 1994 | 5,684 | - | - | - | - | - | - | - | - | - | - | 5,684 |
| 1995 | 5,792 | - | - | - | - | - | - | - | - | - | - | 5,792 |
| 1996 | 6,281 | - | - | - | - | - | - | - | - | - | - | 6,281 |
| 1997 | 6,526 | - | - | - | - | - | - | - | - | - | - | 6,526 |
| 1998 | 6,197 | - | - | - | - | - | - | - | - | - | - | 6,197 |
| 1999 | 6,515 | - | - | - | - | - | - | - | - | - | - | 6,515 |
| 2000 | 6,672 | - | - | - | - | - | - | - | - | - | - | 6,672 |
| 2001 | 6,775 | - | - | - | - | - | - | - | - | - | - | 6,775 |
| 2002 | 7,157 | - | - | - | - | - | - | - | - | - | - | 7,157 |
| 2003 | 7,279 | - | - | - | - | - | - | - | - | - | - | 7,279 |
| 2004 | 7,802 | - | - | - | - | - | - | - | - | - | - | 7,802 |
| 2005 | 7,696 | - | - | - | - | - | - | - | - | - | - | 7,696 |
| 2006 | 7,618 | - | - | - | - | - | - | - | - | - | - | 7,618 |
| 2007 | 8,012 | - | - | - | - | - | - | - | - | - | - | 8,012 |
| 2008 | 7,990 | - | - | - | - | - | - | - | - | - | - | 7,990 |
| 2009 | 8,119 | - | - | - | - | - | - | - | - | - | - | 8,119 |
| 2010 | 7,860 | - | - | - | - | - | - | - | - | - | - | 7,860 |
| 2011 | 7,931 | - | - | - | - | - | - | - | - | - | - | 7,931 |
| 2012 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2013 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2014 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2015 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2016 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2017 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2018 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2019 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2020 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2021 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2022 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2023 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2024 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2025 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2026 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2027 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2028 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2029 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2030 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2031 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2032 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2033 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2034 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2035 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2036 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2037 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2038 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2039 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2040 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2041 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| 2042 | 7,069 | - | - | - | - | - | - | - | - | - | - | 7,069 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | 0.6% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.6% |
| 1997-2012 | 0.5% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.5% |
| 2002-2012 | -0.1% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -0.1% |
| 2007-2012 | -2.5% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -2.5% |
| 2012-2017 | 0.0% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0% |
| 2012-2022 | 0.0% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0% |
| 2012-2032 | 0.0% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0% |
| 2012-2042 | 0.0% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0% |
| 2013-2042 | 0.0% | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0% |

3.3.9 Sales for Resale – Others Forecast

This class is served by four member systems: Beltrami Electric Cooperative, Inc., PKM Electric Cooperative, Inc., Red Lake Electric Cooperative, Inc. and Nodak Electric Cooperative, Inc. Energy sales accounted for 2 percent of total cooperative energy sales in 2012. Sales to this class were projected judgmentally based on input from cooperative staff. The forecasts for the member systems energy sales are shown in Table 3.13. No growth is expected from this class over the forecast horizon.

3.2.10 Controlled Load Energy Sales Forecast

Controlled load sales are the product of a load management mechanism whereby Minnkota has direct control of the customer's load and in some cases switches to an alternative fuel source during times of peak demand. In return the member systems offer their customers a lower electric price on those energy sales. This system was discussed in Section 2. The controlled load sales projection has been developed in coordination with cooperative staff and reflects their input on the level of penetration occurring and marketing plans related to controlled load programs. The projection is shown in Table 3.14. Controlled energy sales are projected to grow from 869,259 MWh in 2013 to 1,095,299 MWh in 2042. This represents a 0.1 percent average annual growth rate throughout the forecast period.

3.3 Energy Forecasts - Total Energy Required

3.3.1 Member System Energy Sales

Historic and projected total retail energy sales are summarized in Table 3.15 (by member), Table 3.16 (by class) and depicted graphically in Figure 3.1. Total Minnkota energy sales, calculated as the sum of the class energy forecasts described above, are projected to grow by 1.2 percent per year from 2013 to 2042. This compares to total system sales growth of 2.7 percent annually from 1983 to 2012. Sales are forecast to grow from 3,550,689 MWh in 2013 to 5,075,996 MWh in 2042.

Table 3.13

Resale-Other Energy Forecasts By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | Red | Red | Roseau | Wild | Total Member Sales |
|-----------------------------|----------|--------|-------------|------|--------|-------|--------|-------|---------|---------|--------------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | Lake | River | Rice | | |
| 1983 | 37,661 | - | 313 | - | 11,693 | - | 5,037 | - | - | 105 | 54,808 |
| 1984 | 43,666 | - | 273 | - | 3,892 | - | 5,418 | - | - | - | 53,249 |
| 1985 | 44,466 | - | 270 | - | 3,932 | - | 5,721 | - | - | - | 54,389 |
| 1986 | 47,197 | - | 257 | - | 3,045 | - | 4,453 | - | - | - | 54,952 |
| 1987 | 51,853 | - | 202 | - | 2,308 | - | 3,011 | - | - | - | 57,374 |
| 1988 | 59,028 | - | 160 | - | 3,201 | - | 3,137 | - | - | - | 65,526 |
| 1989 | 59,473 | - | - | - | 3,356 | - | 3,129 | - | - | - | 65,957 |
| 1990 | 58,606 | - | - | - | 2,721 | - | 3,463 | - | - | - | 64,789 |
| 1991 | 76,124 | - | - | - | 3,470 | - | 3,372 | - | - | - | 82,966 |
| 1992 | 85,571 | - | - | - | 2,840 | - | 3,382 | - | - | - | 91,793 |
| 1993 | 82,462 | - | - | - | 2,949 | - | 7,926 | - | 1,113 | - | 94,450 |
| 1994 | 83,059 | - | - | - | 3,132 | - | 13,997 | - | 1,298 | - | 101,487 |
| 1995 | 84,539 | - | - | - | 3,237 | - | 12,024 | - | 1,902 | - | 101,702 |
| 1996 | 90,693 | - | - | - | 3,552 | - | 16,846 | - | 1,937 | - | 113,028 |
| 1997 | 93,961 | - | - | - | 3,549 | - | 14,220 | - | 1,578 | - | 113,307 |
| 1998 | 98,149 | - | - | - | 2,881 | - | 17,391 | - | 1,611 | - | 120,033 |
| 1999 | 93,413 | - | - | - | 3,059 | - | 18,391 | - | 2,123 | - | 116,986 |
| 2000 | 93,006 | - | - | - | 2,948 | - | 5,732 | - | 2,533 | - | 104,220 |
| 2001 | 92,349 | - | 245 | - | 2,486 | - | 4,628 | - | 2,557 | - | 102,265 |
| 2002 | 95,340 | - | 262 | - | 3,090 | - | 5,691 | - | 2,946 | - | 107,328 |
| 2003 | 87,024 | - | - | - | 3,122 | - | 6,135 | - | 3,104 | - | 99,385 |
| 2004 | 90,803 | - | - | - | 3,632 | - | 6,840 | - | 2,130 | - | 103,406 |
| 2005 | 88,859 | - | - | - | 1,838 | - | 6,874 | - | 2,819 | - | 100,390 |
| 2006 | 98,405 | - | - | - | 3,507 | - | 6,818 | - | - | - | 108,731 |
| 2007 | 89,727 | - | - | - | 3,505 | - | 7,070 | - | - | - | 100,301 |
| 2008 | 84,218 | - | - | - | 3,807 | - | 6,405 | 2,908 | - | - | 97,338 |
| 2009 | 71,122 | - | - | - | 3,985 | - | 7,150 | 2,703 | - | - | 84,960 |
| 2010 | 66,213 | - | - | - | 3,418 | - | 12,194 | 5,952 | - | - | 87,777 |
| 2011 | 54,116 | - | - | - | 3,284 | - | 13,511 | 8,056 | - | - | 78,967 |
| 2012 | 55,908 | - | - | - | 3,333 | - | 15,001 | 8,930 | - | - | 83,171 |
| 2013 | 55,628 | - | - | - | 3,345 | - | 15,076 | 2,500 | - | - | 76,549 |
| 2014 | 55,350 | - | - | - | 3,345 | - | 15,151 | 3,500 | - | - | 77,346 |
| 2015 | 55,073 | - | - | - | 3,345 | - | 15,227 | 6,000 | - | - | 79,645 |
| 2016 | 54,798 | - | - | - | 3,345 | - | 15,303 | 7,000 | - | - | 80,446 |
| 2017 | 54,524 | - | - | - | 3,345 | - | 15,380 | 8,000 | - | - | 81,248 |
| 2018 | 54,251 | - | - | - | 3,345 | - | 15,457 | 9,000 | - | - | 82,053 |
| 2019 | 53,980 | - | - | - | 3,345 | - | 15,534 | 9,000 | - | - | 81,859 |
| 2020 | 53,710 | - | - | - | 3,345 | - | 15,612 | 9,000 | - | - | 81,666 |
| 2021 | 53,441 | - | - | - | 3,345 | - | 15,690 | 9,000 | - | - | 81,476 |
| 2022 | 53,174 | - | - | - | 3,345 | - | 15,768 | 9,000 | - | - | 81,287 |
| 2023 | 52,908 | - | - | - | 3,345 | - | 15,847 | 9,000 | - | - | 81,100 |
| 2024 | 52,644 | - | - | - | 3,345 | - | 15,926 | 9,000 | - | - | 80,915 |
| 2025 | 52,381 | - | - | - | 3,345 | - | 16,006 | 9,000 | - | - | 80,731 |
| 2026 | 52,119 | - | - | - | 3,345 | - | 16,086 | 9,000 | - | - | 80,549 |
| 2027 | 51,858 | - | - | - | 3,345 | - | 16,166 | 9,000 | - | - | 80,369 |
| 2028 | 51,599 | - | - | - | 3,345 | - | 16,247 | 9,000 | - | - | 80,191 |
| 2029 | 51,341 | - | - | - | 3,345 | - | 16,328 | 9,000 | - | - | 80,014 |
| 2030 | 51,084 | - | - | - | 3,345 | - | 16,410 | 9,000 | - | - | 79,839 |
| 2031 | 50,829 | - | - | - | 3,345 | - | 16,492 | 9,000 | - | - | 79,665 |
| 2032 | 50,575 | - | - | - | 3,345 | - | 16,574 | 9,000 | - | - | 79,494 |
| 2033 | 50,322 | - | - | - | 3,345 | - | 16,657 | 9,000 | - | - | 79,324 |
| 2034 | 50,070 | - | - | - | 3,345 | - | 16,741 | 9,000 | - | - | 79,155 |
| 2035 | 49,820 | - | - | - | 3,345 | - | 16,824 | 9,000 | - | - | 78,989 |
| 2036 | 49,571 | - | - | - | 3,345 | - | 16,908 | 9,000 | - | - | 78,824 |
| 2037 | 49,323 | - | - | - | 3,345 | - | 16,993 | 9,000 | - | - | 78,661 |
| 2038 | 49,076 | - | - | - | 3,345 | - | 17,078 | 9,000 | - | - | 78,499 |
| 2039 | 48,831 | - | - | - | 3,345 | - | 17,163 | 9,000 | - | - | 78,339 |
| 2040 | 48,587 | - | - | - | 3,345 | - | 17,249 | 9,000 | - | - | 78,181 |
| 2041 | 48,344 | - | - | - | 3,345 | - | 17,335 | 9,000 | - | - | 78,024 |
| 2042 | 48,102 | - | - | - | 3,345 | - | 17,422 | 9,000 | - | - | 77,869 |
| Average Annual Growth Rates | | | | | | | | | | | |
| 1983-2012 | 1.4% | -- | -100.0% | -- | -4.2% | -- | 3.8% | -- | -- | -100.0% | 1.4% |
| 1997-2012 | -3.4% | -- | -- | -- | -0.4% | -- | 0.4% | -- | -100.0% | -- | -2.0% |
| 2002-2012 | -5.2% | -- | -100.0% | -- | 0.8% | -- | 10.2% | -- | -100.0% | -- | -2.5% |
| 2007-2012 | -9.0% | -- | -- | -- | -1.0% | -- | 16.2% | -- | -- | -- | -3.7% |
| 2012-2017 | -0.5% | -- | -- | -- | 0.1% | -- | 0.5% | -2.2% | -- | -- | -0.5% |
| 2012-2022 | -0.5% | -- | -- | -- | 0.0% | -- | 0.5% | 0.1% | -- | -- | -0.2% |
| 2012-2032 | -0.5% | -- | -- | -- | 0.0% | -- | 0.5% | 0.0% | -- | -- | -0.2% |
| 2012-2042 | -0.5% | -- | -- | -- | 0.0% | -- | 0.5% | 0.0% | -- | -- | -0.2% |
| 2013-2042 | -0.5% | -- | -- | -- | 0.0% | -- | 0.5% | 4.5% | -- | -- | 0.1% |

Table 3.14

Controlled Load Energy Forecast
Minnkota Power Cooperative, Inc.

| <u>Year</u> | <u>Total Controlled MWh</u> | <u>Total Sales MWh</u> | <u>/1</u> | <u>Percent of Total %</u> |
|------------------------------------|-------------------------------------|--------------------------------|-----------|-----------------------------------|
| 2005 | 809,464 | 2,672,308 | | 30.3% |
| 2006 | 843,236 | 2,747,400 | | 30.7% |
| 2007 | 847,033 | 2,907,380 | | 29.1% |
| 2008 | 944,421 | 3,057,683 | | 30.9% |
| 2009 | 953,209 | 3,129,491 | | 30.5% |
| 2010 | 867,745 | 3,036,577 | | 28.6% |
| 2011 | 1,161,671 | 3,159,095 | | 36.8% |
| 2012 | 1,054,730 | 3,097,686 | | 34.0% |
| 2013 | 869,259 | 3,233,116 | | 26.9% |
| 2014 | 876,312 | 3,289,946 | | 26.6% |
| 2015 | 881,824 | 3,332,557 | | 26.5% |
| 2016 | 890,379 | 3,390,557 | | 26.3% |
| 2017 | 898,077 | 3,437,221 | | 26.1% |
| 2018 | 911,695 | 3,489,008 | | 26.1% |
| 2019 | 922,472 | 3,541,314 | | 26.0% |
| 2020 | 935,216 | 3,594,753 | | 26.0% |
| 2021 | 948,281 | 3,647,531 | | 26.0% |
| 2022 | 962,764 | 3,707,207 | | 26.0% |
| 2023 | 976,192 | 3,767,045 | | 25.9% |
| 2024 | 988,328 | 3,819,616 | | 25.9% |
| 2025 | 999,645 | 3,870,340 | | 25.8% |
| 2026 | 1,009,569 | 3,920,923 | | 25.7% |
| 2027 | 1,017,092 | 3,958,947 | | 25.7% |
| 2028 | 1,023,833 | 3,995,284 | | 25.6% |
| 2029 | 1,030,831 | 4,036,924 | | 25.5% |
| 2030 | 1,037,383 | 4,073,749 | | 25.5% |
| 2031 | 1,043,225 | 4,108,967 | | 25.4% |
| 2032 | 1,049,274 | 4,145,778 | | 25.3% |
| 2033 | 1,055,290 | 4,187,279 | | 25.2% |
| 2034 | 1,060,598 | 4,222,939 | | 25.1% |
| 2035 | 1,065,442 | 4,257,641 | | 25.0% |
| 2036 | 1,070,243 | 4,292,834 | | 24.9% |
| 2037 | 1,075,194 | 4,333,292 | | 24.8% |
| 2038 | 1,079,476 | 4,367,611 | | 24.7% |
| 2039 | 1,083,806 | 4,402,763 | | 24.6% |
| 2040 | 1,087,794 | 4,437,232 | | 24.5% |
| 2041 | 1,091,635 | 4,471,745 | | 24.4% |
| 2042 | 1,095,299 | 4,506,012 | | 24.3% |
| Average Annual Growth Rates | | | | |
| 2007-2012 | 4.5% | 1.3% | | |
| 2012-2017 | -3.2% | 2.1% | | |
| 2012-2022 | -0.9% | 1.8% | | |
| 2012-2032 | 0.0% | 1.5% | | |
| 2012-2042 | 0.1% | 1.3% | | |

/1 Does not add up to total sales - excludes some classes in the calculation

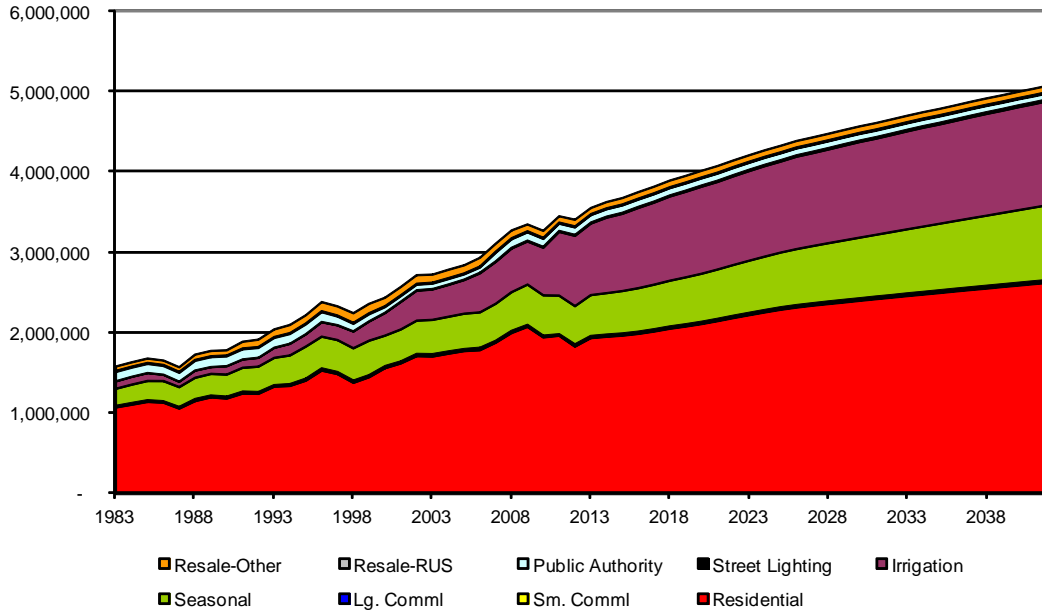
Table 3.16

Retail Energy Forecasts By Class (MWh)
Minnkota Power Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Resale RUS</u> | <u>Resale Other</u> | <u>Total Member Sales</u> | <u>MWh From 2011 PRS</u> |
|-----------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------------|-------------------|---------------------|---------------------------|--------------------------|
| 1983 | 1,074,774 | 8,581 | 8,691 | 213,532 | 96,821 | 2,297 | 116,698 | 5,998 | 54,808 | 1,582,200 | |
| 1984 | 1,108,645 | 8,766 | 11,430 | 228,310 | 100,966 | 2,291 | 114,047 | 6,143 | 53,249 | 1,633,847 | |
| 1985 | 1,144,096 | 9,498 | 8,609 | 240,047 | 102,570 | 2,272 | 113,092 | 6,011 | 54,389 | 1,680,584 | |
| 1986 | 1,134,444 | 9,209 | 6,313 | 251,732 | 82,859 | 2,440 | 108,873 | 5,339 | 54,952 | 1,656,160 | |
| 1987 | 1,060,118 | 9,362 | 9,299 | 247,156 | 71,582 | 2,517 | 109,994 | 5,389 | 57,374 | 1,572,791 | |
| 1988 | 1,153,335 | 9,939 | 14,158 | 264,992 | 92,961 | 2,514 | 120,178 | 5,713 | 65,526 | 1,729,316 | |
| 1989 | 1,200,468 | 10,846 | 10,420 | 268,762 | 88,255 | 2,536 | 122,784 | 5,387 | 65,957 | 1,775,415 | |
| 1990 | 1,185,203 | 11,352 | 10,370 | 275,335 | 108,000 | 2,687 | 120,326 | 5,410 | 64,789 | 1,783,473 | |
| 1991 | 1,247,575 | 11,334 | 11,301 | 295,841 | 107,022 | 2,997 | 125,094 | 5,103 | 82,966 | 1,889,235 | |
| 1992 | 1,243,731 | 11,970 | 9,246 | 316,059 | 112,593 | 2,906 | 121,864 | 5,378 | 91,793 | 1,915,539 | |
| 1993 | 1,333,117 | 12,765 | 4,947 | 339,869 | 127,112 | 3,160 | 121,565 | 5,651 | 94,450 | 2,042,636 | |
| 1994 | 1,342,636 | 12,217 | 9,058 | 357,114 | 147,086 | 3,331 | 120,015 | 5,684 | 101,487 | 2,098,628 | |
| 1995 | 1,408,446 | 12,961 | 9,879 | 400,070 | 155,126 | 3,524 | 120,798 | 5,792 | 101,702 | 2,218,297 | |
| 1996 | 1,533,815 | 14,483 | 11,080 | 395,028 | 182,542 | 3,676 | 122,293 | 6,281 | 113,028 | 2,382,226 | |
| 1997 | 1,489,897 | 14,015 | 9,371 | 398,764 | 185,786 | 3,821 | 107,107 | 6,526 | 113,307 | 2,328,596 | |
| 1998 | 1,381,037 | 13,213 | 12,410 | 403,228 | 210,935 | 4,010 | 92,781 | 6,197 | 120,033 | 2,243,845 | |
| 1999 | 1,451,488 | 14,305 | 9,945 | 428,790 | 241,587 | 4,383 | 86,970 | 6,515 | 116,986 | 2,360,969 | |
| 2000 | 1,563,590 | 14,542 | 10,023 | 379,204 | 282,830 | 4,623 | 70,312 | 6,672 | 104,220 | 2,436,016 | |
| 2001 | 1,623,580 | 14,055 | 8,563 | 398,454 | 344,104 | 5,042 | 67,092 | 6,775 | 102,265 | 2,569,930 | |
| 2002 | 1,714,172 | 15,300 | 9,776 | 415,330 | 374,005 | 6,049 | 68,285 | 7,157 | 107,328 | 2,717,402 | |
| 2003 | 1,708,840 | 14,504 | 13,198 | 427,713 | 379,738 | 5,508 | 66,876 | 7,279 | 99,385 | 2,723,041 | |
| 2004 | 1,744,548 | 14,277 | 11,228 | 431,994 | 398,151 | 5,951 | 66,184 | 7,802 | 103,406 | 2,783,541 | |
| 2005 | 1,777,231 | 13,619 | 8,417 | 441,813 | 419,506 | 6,468 | 64,102 | 7,696 | 100,390 | 2,839,241 | |
| 2006 | 1,788,260 | 10,558 | 17,417 | 441,048 | 488,154 | 6,815 | 64,479 | 7,618 | 108,731 | 2,933,080 | |
| 2007 | 1,882,154 | 10,027 | 12,052 | 461,068 | 522,111 | 7,222 | 106,080 | 8,012 | 100,301 | 3,109,028 | |
| 2008 | 2,003,239 | 10,072 | 13,595 | 483,087 | 544,311 | 7,587 | 105,857 | 7,990 | 97,338 | 3,273,077 | |
| 2009 | 2,079,990 | 8,784 | 11,672 | 503,411 | 537,765 | 8,066 | 103,905 | 8,119 | 84,960 | 3,346,672 | |
| 2010 | 1,948,468 | 8,010 | 10,058 | 503,168 | 594,596 | 8,684 | 99,078 | 7,860 | 87,777 | 3,267,699 | |
| 2011 | 1,969,410 | 8,138 | 7,081 | 481,026 | 796,029 | 9,247 | 90,651 | 7,931 | 78,967 | 3,448,481 | 3,503,254 |
| 2012 | 1,832,850 | 8,056 | 17,400 | 476,592 | 876,814 | 9,558 | 93,782 | 7,069 | 83,171 | 3,405,291 | 3,565,100 |
| 2013 | 1,939,817 | 8,156 | 15,073 | 509,732 | 891,253 | 9,719 | 93,322 | 7,069 | 76,549 | 3,550,689 | 3,624,333 |
| 2014 | 1,956,310 | 8,196 | 15,179 | 517,568 | 940,347 | 9,871 | 92,865 | 7,069 | 77,346 | 3,624,749 | 3,689,590 |
| 2015 | 1,970,770 | 8,236 | 15,313 | 529,254 | 962,741 | 10,021 | 92,410 | 7,069 | 79,645 | 3,675,458 | 3,737,194 |
| 2016 | 1,992,338 | 8,276 | 15,419 | 542,705 | 999,856 | 10,171 | 91,957 | 7,069 | 80,446 | 3,748,237 | 3,784,694 |
| 2017 | 2,022,503 | 8,315 | 15,552 | 556,576 | 1,022,702 | 10,338 | 91,507 | 7,069 | 81,248 | 3,815,810 | 3,840,972 |
| 2018 | 2,057,400 | 8,355 | 15,682 | 570,829 | 1,049,485 | 10,504 | 91,059 | 7,069 | 82,053 | 3,892,435 | 3,902,733 |
| 2019 | 2,084,945 | 8,395 | 15,839 | 584,913 | 1,066,206 | 10,670 | 90,614 | 7,069 | 81,859 | 3,950,510 | 3,960,946 |
| 2020 | 2,115,410 | 8,435 | 15,968 | 599,229 | 1,084,865 | 10,834 | 90,170 | 7,069 | 81,666 | 4,013,648 | 4,031,539 |
| 2021 | 2,151,516 | 8,476 | 16,125 | 615,203 | 1,091,462 | 10,998 | 89,729 | 7,069 | 81,476 | 4,072,053 | 4,104,571 |
| 2022 | 2,190,516 | 8,516 | 16,255 | 632,179 | 1,104,996 | 11,178 | 89,290 | 7,069 | 81,287 | 4,141,286 | 4,180,235 |
| 2023 | 2,226,217 | 8,556 | 16,388 | 649,601 | 1,117,468 | 11,357 | 88,854 | 7,069 | 81,100 | 4,206,609 | 4,254,364 |
| 2024 | 2,261,495 | 8,597 | 16,495 | 666,195 | 1,127,876 | 11,536 | 88,419 | 7,069 | 80,915 | 4,268,595 | 4,323,140 |
| 2025 | 2,294,918 | 8,637 | 16,628 | 682,757 | 1,134,222 | 11,713 | 87,987 | 7,069 | 80,731 | 4,324,661 | 4,387,969 |
| 2026 | 2,322,398 | 8,677 | 16,734 | 698,137 | 1,151,505 | 11,889 | 87,557 | 7,069 | 80,549 | 4,384,516 | 4,449,084 |
| 2027 | 2,345,064 | 8,718 | 16,868 | 712,716 | 1,157,725 | 12,082 | 87,129 | 7,069 | 80,369 | 4,427,740 | 4,506,492 |
| 2028 | 2,366,336 | 8,759 | 16,974 | 727,016 | 1,167,881 | 12,274 | 86,704 | 7,069 | 80,191 | 4,473,203 | 4,569,342 |
| 2029 | 2,386,546 | 8,799 | 17,107 | 741,642 | 1,179,974 | 12,465 | 86,280 | 7,069 | 80,014 | 4,519,897 | 4,633,531 |
| 2030 | 2,407,022 | 8,840 | 17,214 | 756,204 | 1,191,004 | 12,655 | 85,859 | 7,069 | 79,839 | 4,565,705 | 4,700,695 |
| 2031 | 2,426,776 | 8,881 | 17,347 | 770,822 | 1,196,970 | 12,861 | 85,440 | 7,069 | 79,665 | 4,605,832 | 4,758,993 |
| 2032 | 2,446,090 | 8,922 | 17,453 | 785,491 | 1,208,872 | 13,066 | 85,023 | 7,069 | 79,494 | 4,651,479 | 4,825,967 |
| 2033 | 2,465,969 | 8,963 | 17,587 | 800,243 | 1,220,710 | 13,270 | 84,609 | 7,069 | 79,324 | 4,697,741 | 4,888,552 |
| 2034 | 2,485,003 | 9,004 | 17,693 | 815,015 | 1,231,484 | 13,472 | 84,196 | 7,069 | 79,155 | 4,742,091 | 4,954,986 |
| 2035 | 2,503,837 | 9,045 | 17,827 | 829,972 | 1,237,194 | 13,691 | 83,785 | 7,069 | 78,989 | 4,781,408 | 5,021,907 |
| 2036 | 2,523,247 | 9,086 | 17,933 | 844,859 | 1,246,840 | 13,909 | 83,377 | 7,069 | 78,824 | 4,825,142 | 5,088,919 |
| 2037 | 2,541,732 | 9,127 | 18,066 | 859,893 | 1,258,421 | 14,126 | 82,971 | 7,069 | 78,661 | 4,870,066 | 5,153,391 |
| 2038 | 2,560,069 | 9,169 | 18,172 | 874,937 | 1,267,938 | 14,358 | 82,566 | 7,069 | 78,499 | 4,912,777 | 5,222,473 |
| 2039 | 2,579,056 | 9,210 | 18,306 | 890,123 | 1,273,390 | 14,590 | 82,164 | 7,069 | 78,339 | 4,952,246 | 5,288,630 |
| 2040 | 2,597,371 | 9,251 | 18,412 | 905,313 | 1,282,777 | 14,820 | 81,764 | 7,069 | 78,181 | 4,994,957 | 5,361,014 |
| 2041 | 2,615,492 | 9,293 | 18,546 | 920,700 | 1,288,100 | 15,048 | 81,366 | 7,069 | 78,024 | 5,033,637 | |
| 2042 | 2,633,422 | 9,334 | 18,652 | 936,031 | 1,297,358 | 15,293 | 80,970 | 7,069 | 77,869 | 5,075,996 | |
| Average Annual Growth Rates | | | | | | | | | | | |
| 1983-2012 | 1.9% | -0.2% | 2.4% | 2.8% | 7.9% | 5.0% | -0.8% | 0.6% | 1.4% | 2.7% | -- |
| 1997-2012 | 1.4% | -3.6% | 4.2% | 1.2% | 10.9% | 6.3% | -0.9% | 0.5% | -2.0% | 2.6% | -- |
| 2002-2012 | 0.7% | -6.2% | 5.9% | 1.4% | 8.9% | 4.7% | 3.2% | -0.1% | -2.5% | 2.3% | -- |
| 2007-2012 | -0.5% | -4.3% | 7.6% | 0.7% | 10.9% | 5.8% | -2.4% | -2.5% | -3.7% | 1.8% | -- |
| 2012-2017 | 2.0% | 0.6% | -2.2% | 3.2% | 3.1% | 1.6% | -0.5% | 0.0% | -0.5% | 2.3% | 1.5% |
| 2012-2022 | 1.8% | 0.6% | -0.7% | 2.9% | 2.3% | 1.6% | -0.5% | 0.0% | -0.2% | 2.0% | 1.6% |
| 2012-2032 | 1.5% | 0.5% | 0.0% | 2.5% | 1.6% | 1.6% | -0.5% | 0.0% | -0.2% | 1.6% | 1.5% |
| 2012-2042 | 1.2% | 0.5% | 0.2% | 2.3% | 1.3% | 1.6% | -0.5% | 0.0% | -0.2% | 1.3% | |
| 2013-2042 | 1.1% | 0.5% | 0.7% | 2.1% | 1.3% | 1.6% | -0.5% | 0.0% | 0.1% | 1.2% | |

Figure 3.1

Retail Energy Forecasts By Class (MWh)
Minnkota Power Cooperative, Inc.



Member systems' own use and losses are defined as the energy member system purchases from Minnkota less total retail sales to member system customers. They are typically projected based on the average own use and losses experienced during the 2008-2012 period.

Total member systems' energy requirements, calculated as the sum of total sales and own use and losses, are projected to increase from 3,710,442 MWh in 2013 to 5,298,268 MWh in 2042 as shown in Table 3.17. This reflects a compound growth rate of 1.2 percent per year from 2013 through 2042. The total member sales and member requirements forecasts are driven, to a large extent, by the residential class forecast. This class comprised approximately 54 percent of member system 2012 sales and is expected to decrease to 52 percent by 2042.

Table 3.18 presents total customers by member, while Table 3.19 presents customers by revenue class. Total customers are projected to increase from 122,944 in 2013 to 168,979 in 2042. This represents an average annual growth rate of 1.1 percent per year from 2013 through 2042. This is slower than the 1.9 percent per year experienced over the 1983 through 2012 period.

3.3.2 Northern Municipal Power Agency

Sales to the Northern Municipal Power Agency (NMPA) are presented in Table 3.20. Energy requirements forecasts for each municipal served by NMPA were developed individually by specifying an econometric model of total energy requirements. The models were typically driven by weather variables (such as heating and cooling degree days), demographic variables (such as household growth) and economic variables (such as income and employment). The individual models are presented in Appendix B.

Purchases are expected to increase at 0.6 percent per year over the forecast period of 2013-2042. This compares to the 0.3 percent rate observed over the historic period of 1997 through 2012.

3.3.3 Minnkota Transmission Losses

Minnkota transmission losses have been projected at 5.5 percent based on staff discussions and incorporate an adjustment in the calculation of losses starting in 2005.

3.3.4 Joint System Energy Requirements

Total Joint System energy requirements are calculated as the sum of total member system energy requirements plus Minnkota's losses and sales to NMPA. Requirements are projected to increase from 4,386,767 MWh in 2013 to 6,157,151 MWh in 2042. This reflects a compound growth rate of 1.2 percent per year from 2013 through 2042. Table 3.21 and Figure 3.2 present the forecasts of total energy requirements.

Table 3.18

Total Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Roseau | Wild | Total Members |
|-----------------------------|----------|--------|-------------|-------|--------|-------|-------|-------|-------|--------|--------|---------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | | Rice | |
| 1983 | 10,745 | 10,175 | 1,677 | 3,551 | 13,520 | 4,331 | 3,785 | 4,794 | 4,181 | 4,031 | 9,894 | 70,684 |
| 1984 | 11,095 | 10,317 | 1,669 | 3,361 | 13,602 | 4,406 | 3,765 | 4,784 | 4,176 | 4,072 | 10,054 | 71,300 |
| 1985 | 11,350 | 10,642 | 1,642 | 3,158 | 13,714 | 4,444 | 3,750 | 4,743 | 4,167 | 4,161 | 10,099 | 71,871 |
| 1986 | 11,562 | 11,195 | 1,618 | 3,148 | 13,821 | 4,469 | 3,754 | 4,717 | 4,184 | 4,264 | 10,167 | 72,899 |
| 1987 | 11,782 | 11,432 | 1,608 | 3,161 | 13,902 | 4,563 | 3,739 | 4,692 | 4,191 | 4,416 | 10,361 | 73,848 |
| 1988 | 12,097 | 11,661 | 1,594 | 3,196 | 13,873 | 4,670 | 3,751 | 4,677 | 4,190 | 4,609 | 10,428 | 74,746 |
| 1989 | 12,354 | 12,279 | 1,588 | 3,215 | 13,910 | 4,792 | 3,729 | 4,673 | 4,188 | 4,748 | 10,485 | 75,961 |
| 1990 | 12,578 | 12,815 | 1,574 | 3,266 | 13,923 | 4,956 | 3,698 | 4,666 | 4,187 | 4,872 | 10,554 | 77,088 |
| 1991 | 12,860 | 13,408 | 1,562 | 3,288 | 13,947 | 5,138 | 3,694 | 4,674 | 4,180 | 4,983 | 10,629 | 78,364 |
| 1992 | 13,197 | 14,291 | 1,557 | 3,326 | 14,025 | 5,248 | 3,690 | 4,673 | 4,175 | 5,089 | 10,783 | 80,056 |
| 1993 | 13,571 | 15,183 | 1,556 | 3,390 | 14,146 | 5,326 | 3,705 | 4,701 | 4,217 | 5,149 | 10,985 | 81,929 |
| 1994 | 13,955 | 16,017 | 1,549 | 3,427 | 14,329 | 5,408 | 3,707 | 4,699 | 4,241 | 5,242 | 11,064 | 83,637 |
| 1995 | 14,350 | 16,809 | 1,546 | 3,477 | 14,463 | 5,477 | 3,709 | 4,719 | 4,277 | 5,403 | 11,225 | 85,454 |
| 1996 | 14,735 | 17,866 | 1,531 | 3,513 | 14,569 | 5,531 | 3,710 | 4,751 | 4,318 | 5,540 | 11,391 | 87,455 |
| 1997 | 15,066 | 18,195 | 1,518 | 3,535 | 14,792 | 5,613 | 3,692 | 4,759 | 4,365 | 5,624 | 11,549 | 88,709 |
| 1998 | 15,517 | 18,985 | 1,500 | 3,591 | 14,963 | 5,707 | 3,655 | 4,793 | 4,404 | 5,723 | 11,698 | 90,536 |
| 1999 | 15,946 | 19,846 | 1,487 | 3,662 | 15,024 | 5,827 | 3,642 | 4,811 | 4,440 | 5,786 | 11,915 | 92,386 |
| 2000 | 16,354 | 20,645 | 1,455 | 3,724 | 15,262 | 5,942 | 3,632 | 4,827 | 4,436 | 5,943 | 12,167 | 94,388 |
| 2001 | 16,831 | 21,660 | 1,435 | 3,791 | 15,787 | 6,020 | 3,609 | 4,848 | 4,483 | 5,910 | 12,366 | 96,737 |
| 2002 | 17,362 | 22,930 | 1,434 | 3,892 | 15,684 | 6,110 | 3,604 | 4,875 | 4,551 | 5,988 | 12,553 | 98,982 |
| 2003 | 17,875 | 24,557 | 1,435 | 4,000 | 15,896 | 6,181 | 3,606 | 4,919 | 4,612 | 6,069 | 12,778 | 101,927 |
| 2004 | 18,389 | 26,281 | 1,429 | 4,086 | 16,195 | 6,248 | 3,606 | 4,971 | 4,660 | 6,150 | 13,016 | 105,030 |
| 2005 | 18,759 | 28,361 | 1,427 | 4,172 | 16,398 | 6,303 | 3,635 | 4,997 | 4,620 | 6,205 | 13,133 | 108,009 |
| 2006 | 19,214 | 30,288 | 1,417 | 4,245 | 16,633 | 6,323 | 3,603 | 5,030 | 4,648 | 6,281 | 13,300 | 110,982 |
| 2007 | 19,589 | 31,711 | 1,423 | 4,307 | 16,819 | 6,338 | 3,608 | 5,073 | 4,678 | 6,323 | 13,514 | 113,383 |
| 2008 | 19,835 | 32,946 | 1,443 | 4,342 | 17,003 | 6,338 | 3,612 | 5,121 | 4,726 | 6,346 | 13,620 | 115,332 |
| 2009 | 20,012 | 33,922 | 1,443 | 4,356 | 17,184 | 6,353 | 3,612 | 5,168 | 4,711 | 6,348 | 13,672 | 116,781 |
| 2010 | 20,190 | 34,799 | 1,453 | 4,386 | 17,304 | 6,370 | 3,611 | 5,200 | 4,667 | 6,318 | 13,718 | 118,015 |
| 2011 | 20,275 | 35,731 | 1,466 | 4,397 | 17,397 | 6,375 | 3,627 | 5,203 | 4,676 | 6,327 | 13,769 | 119,241 |
| 2012 | 20,297 | 37,138 | 1,476 | 4,374 | 17,566 | 6,397 | 3,666 | 5,218 | 4,683 | 6,332 | 13,828 | 120,976 |
| 2013 | 20,361 | 38,659 | 1,485 | 4,380 | 17,749 | 6,474 | 3,687 | 5,226 | 4,709 | 6,340 | 13,874 | 122,944 |
| 2014 | 20,491 | 40,183 | 1,496 | 4,373 | 17,944 | 6,556 | 3,708 | 5,236 | 4,740 | 6,353 | 13,919 | 125,000 |
| 2015 | 20,678 | 41,706 | 1,505 | 4,335 | 18,130 | 6,636 | 3,729 | 5,249 | 4,383 | 6,372 | 13,958 | 126,682 |
| 2016 | 20,907 | 43,196 | 1,513 | 4,356 | 18,307 | 6,715 | 3,750 | 5,269 | 4,424 | 6,396 | 13,999 | 128,832 |
| 2017 | 21,170 | 44,650 | 1,521 | 4,381 | 18,468 | 6,789 | 3,772 | 5,289 | 4,465 | 6,430 | 14,039 | 130,974 |
| 2018 | 21,416 | 46,068 | 1,526 | 4,403 | 18,626 | 6,858 | 3,793 | 5,309 | 4,496 | 6,470 | 14,080 | 133,046 |
| 2019 | 21,649 | 47,449 | 1,531 | 4,422 | 18,783 | 6,925 | 3,816 | 5,329 | 4,516 | 6,515 | 14,121 | 135,056 |
| 2020 | 21,876 | 48,794 | 1,535 | 4,439 | 18,941 | 6,989 | 3,837 | 5,349 | 4,530 | 6,551 | 14,162 | 137,004 |
| 2021 | 22,096 | 50,101 | 1,538 | 4,456 | 19,098 | 7,053 | 3,859 | 5,369 | 4,545 | 6,586 | 14,203 | 138,903 |
| 2022 | 22,300 | 51,374 | 1,541 | 4,469 | 19,255 | 7,113 | 3,880 | 5,390 | 4,560 | 6,615 | 14,244 | 140,742 |
| 2023 | 22,494 | 52,609 | 1,544 | 4,480 | 19,413 | 7,170 | 3,903 | 5,410 | 4,573 | 6,642 | 14,284 | 142,522 |
| 2024 | 22,682 | 53,808 | 1,545 | 4,490 | 19,570 | 7,226 | 3,924 | 5,430 | 4,587 | 6,667 | 14,324 | 144,253 |
| 2025 | 22,863 | 54,969 | 1,546 | 4,498 | 19,727 | 7,281 | 3,946 | 5,450 | 4,600 | 6,689 | 14,364 | 145,934 |
| 2026 | 23,040 | 56,094 | 1,546 | 4,506 | 19,885 | 7,336 | 3,968 | 5,470 | 4,615 | 6,711 | 14,404 | 147,574 |
| 2027 | 23,213 | 57,183 | 1,547 | 4,513 | 20,042 | 7,389 | 3,990 | 5,490 | 4,628 | 6,731 | 14,444 | 149,170 |
| 2028 | 23,383 | 58,235 | 1,548 | 4,519 | 20,199 | 7,442 | 4,012 | 5,510 | 4,641 | 6,750 | 14,484 | 150,723 |
| 2029 | 23,548 | 59,250 | 1,548 | 4,526 | 20,357 | 7,495 | 4,034 | 5,530 | 4,654 | 6,767 | 14,524 | 152,234 |
| 2030 | 23,709 | 60,229 | 1,547 | 4,531 | 20,514 | 7,547 | 4,056 | 5,550 | 4,668 | 6,784 | 14,564 | 153,699 |
| 2031 | 23,868 | 61,171 | 1,546 | 4,535 | 20,671 | 7,599 | 4,078 | 5,570 | 4,681 | 6,800 | 14,604 | 155,123 |
| 2032 | 24,024 | 62,077 | 1,546 | 4,540 | 20,828 | 7,650 | 4,100 | 5,591 | 4,694 | 6,814 | 14,644 | 156,508 |
| 2033 | 24,179 | 62,945 | 1,545 | 4,545 | 20,986 | 7,702 | 4,123 | 5,611 | 4,707 | 6,829 | 14,684 | 157,856 |
| 2034 | 24,333 | 63,778 | 1,544 | 4,549 | 21,143 | 7,754 | 4,144 | 5,631 | 4,721 | 6,843 | 14,724 | 159,164 |
| 2035 | 24,486 | 64,573 | 1,544 | 4,553 | 21,300 | 7,806 | 4,167 | 5,651 | 4,734 | 6,856 | 14,764 | 160,434 |
| 2036 | 24,639 | 65,333 | 1,543 | 4,557 | 21,457 | 7,859 | 4,189 | 5,671 | 4,747 | 6,870 | 14,804 | 161,670 |
| 2037 | 24,796 | 66,080 | 1,542 | 4,563 | 21,615 | 7,913 | 4,211 | 5,691 | 4,760 | 6,885 | 14,844 | 162,900 |
| 2038 | 24,955 | 66,817 | 1,542 | 4,569 | 21,772 | 7,969 | 4,233 | 5,711 | 4,774 | 6,900 | 14,884 | 164,126 |
| 2039 | 25,119 | 67,541 | 1,541 | 4,576 | 21,929 | 8,027 | 4,256 | 5,731 | 4,787 | 6,916 | 14,924 | 165,347 |
| 2040 | 25,287 | 68,254 | 1,541 | 4,584 | 22,086 | 8,087 | 4,278 | 5,751 | 4,801 | 6,934 | 14,964 | 166,567 |
| 2041 | 25,457 | 68,954 | 1,542 | 4,593 | 22,243 | 8,148 | 4,301 | 5,771 | 4,815 | 6,952 | 15,004 | 167,778 |
| 2042 | 25,628 | 69,644 | 1,542 | 4,601 | 22,400 | 8,209 | 4,322 | 5,791 | 4,828 | 6,969 | 15,044 | 168,979 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | 2.2% | 4.6% | -0.4% | 0.7% | 0.9% | 1.4% | -0.1% | 0.3% | 0.4% | 1.6% | 1.2% | 1.9% |
| 1997-2012 | 2.0% | 4.9% | -0.2% | 1.4% | 1.2% | 0.9% | 0.0% | 0.6% | 0.5% | 0.8% | 1.2% | 2.1% |
| 2002-2012 | 1.6% | 4.9% | 0.3% | 1.2% | 1.1% | 0.5% | 0.2% | 0.7% | 0.3% | 0.6% | 1.0% | 2.0% |
| 2007-2012 | 0.7% | 3.2% | 0.7% | 0.3% | 0.9% | 0.2% | 0.3% | 0.6% | 0.0% | 0.0% | 0.5% | 1.3% |
| 2012-2017 | 0.8% | 3.8% | 0.6% | 0.0% | 1.0% | 1.2% | 0.6% | 0.3% | -0.9% | 0.3% | 0.3% | 1.6% |
| 2012-2022 | 0.9% | 3.3% | 0.4% | 0.2% | 0.9% | 1.1% | 0.6% | 0.3% | -0.3% | 0.4% | 0.3% | 1.5% |
| 2012-2032 | 0.8% | 2.6% | 0.2% | 0.2% | 0.9% | 0.9% | 0.6% | 0.3% | 0.0% | 0.4% | 0.3% | 1.3% |
| 2012-2042 | 0.8% | 2.1% | 0.1% | 0.2% | 0.8% | 0.8% | 0.6% | 0.3% | 0.1% | 0.3% | 0.3% | 1.1% |
| 2013-2042 | 0.8% | 2.1% | 0.1% | 0.2% | 0.8% | 0.8% | 0.5% | 0.4% | 0.1% | 0.3% | 0.3% | 1.1% |

Table 3.19

Member Forecasts By Class
Minnkota Power Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Resale RUS</u> | <u>Resale Other</u> | <u>Total Members</u> |
|-----------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------------|-------------------|---------------------|----------------------|
| 1983 | 60,510 | 4,936 | 249 | 4,588 | 57 | 221 | 111 | 1 | 10 | 70,684 |
| 1984 | 60,929 | 5,061 | 266 | 4,647 | 58 | 219 | 112 | 1 | 8 | 71,300 |
| 1985 | 61,360 | 5,137 | 266 | 4,708 | 59 | 219 | 112 | 1 | 8 | 71,871 |
| 1986 | 62,192 | 5,236 | 267 | 4,800 | 59 | 225 | 111 | 1 | 9 | 72,899 |
| 1987 | 62,877 | 5,356 | 263 | 4,939 | 60 | 231 | 112 | 1 | 10 | 73,848 |
| 1988 | 63,612 | 5,469 | 262 | 4,989 | 60 | 229 | 112 | 2 | 10 | 74,746 |
| 1989 | 64,675 | 5,501 | 259 | 5,096 | 60 | 248 | 112 | 1 | 9 | 75,961 |
| 1990 | 65,616 | 5,525 | 273 | 5,225 | 62 | 265 | 112 | 1 | 9 | 77,088 |
| 1991 | 66,550 | 5,613 | 325 | 5,403 | 63 | 286 | 113 | 1 | 10 | 78,364 |
| 1992 | 67,908 | 5,714 | 374 | 5,570 | 65 | 301 | 113 | 1 | 10 | 80,056 |
| 1993 | 69,503 | 5,761 | 396 | 5,765 | 67 | 312 | 112 | 1 | 11 | 81,929 |
| 1994 | 70,966 | 5,828 | 404 | 5,921 | 69 | 325 | 112 | 1 | 11 | 83,637 |
| 1995 | 72,532 | 5,840 | 404 | 6,140 | 74 | 339 | 113 | 1 | 11 | 85,454 |
| 1996 | 74,471 | 5,746 | 414 | 6,245 | 104 | 352 | 111 | 1 | 11 | 87,455 |
| 1997 | 75,764 | 5,540 | 423 | 6,383 | 107 | 369 | 111 | 1 | 11 | 88,709 |
| 1998 | 77,412 | 5,422 | 433 | 6,649 | 114 | 383 | 111 | 1 | 11 | 90,536 |
| 1999 | 78,882 | 5,447 | 443 | 6,979 | 125 | 394 | 103 | 1 | 13 | 92,386 |
| 2000 | 80,863 | 5,443 | 388 | 7,066 | 110 | 417 | 87 | 1 | 12 | 94,388 |
| 2001 | 85,044 | 4,969 | 359 | 5,827 | 112 | 389 | 25 | 1 | 12 | 96,737 |
| 2002 | 87,238 | 4,892 | 361 | 5,950 | 116 | 387 | 26 | 1 | 11 | 98,982 |
| 2003 | 89,950 | 4,679 | 403 | 6,383 | 119 | 354 | 28 | 1 | 10 | 101,927 |
| 2004 | 92,964 | 4,457 | 422 | 6,639 | 125 | 385 | 28 | 1 | 10 | 105,030 |
| 2005 | 95,873 | 4,269 | 406 | 6,868 | 127 | 427 | 28 | 1 | 10 | 108,009 |
| 2006 | 99,685 | 3,081 | 410 | 7,180 | 141 | 448 | 26 | 1 | 10 | 110,982 |
| 2007 | 102,245 | 2,621 | 414 | 7,401 | 154 | 509 | 28 | 1 | 10 | 113,383 |
| 2008 | 104,083 | 2,409 | 421 | 7,686 | 158 | 534 | 29 | 1 | 11 | 115,332 |
| 2009 | 106,193 | 1,519 | 427 | 7,871 | 178 | 553 | 29 | 1 | 11 | 116,781 |
| 2010 | 107,232 | 1,475 | 430 | 8,082 | 185 | 569 | 29 | 1 | 11 | 118,015 |
| 2011 | 108,326 | 1,417 | 426 | 8,230 | 213 | 590 | 28 | 1 | 11 | 119,241 |
| 2012 | 109,913 | 1,355 | 434 | 8,408 | 217 | 610 | 27 | 1 | 11 | 120,976 |
| 2013 | 111,689 | 1,356 | 441 | 8,579 | 220 | 621 | 27 | 1 | 11 | 122,944 |
| 2014 | 113,554 | 1,357 | 443 | 8,747 | 229 | 632 | 27 | 1 | 11 | 125,000 |
| 2015 | 115,083 | 1,358 | 446 | 8,881 | 233 | 643 | 27 | 1 | 11 | 126,682 |
| 2016 | 117,025 | 1,359 | 448 | 9,066 | 241 | 654 | 27 | 1 | 11 | 128,832 |
| 2017 | 118,962 | 1,360 | 451 | 9,252 | 245 | 666 | 27 | 1 | 11 | 130,974 |
| 2018 | 120,827 | 1,361 | 454 | 9,436 | 251 | 678 | 27 | 1 | 11 | 133,046 |
| 2019 | 122,634 | 1,362 | 458 | 9,619 | 254 | 690 | 27 | 1 | 11 | 135,056 |
| 2020 | 124,378 | 1,363 | 461 | 9,801 | 260 | 702 | 27 | 1 | 11 | 137,004 |
| 2021 | 126,077 | 1,364 | 465 | 9,981 | 263 | 714 | 27 | 1 | 11 | 138,903 |
| 2022 | 127,715 | 1,365 | 468 | 10,160 | 269 | 727 | 27 | 1 | 11 | 140,742 |
| 2023 | 129,298 | 1,366 | 471 | 10,336 | 273 | 740 | 27 | 1 | 11 | 142,522 |
| 2024 | 130,833 | 1,367 | 473 | 10,511 | 277 | 753 | 27 | 1 | 11 | 144,253 |
| 2025 | 132,323 | 1,368 | 476 | 10,684 | 280 | 766 | 27 | 1 | 11 | 145,934 |
| 2026 | 133,769 | 1,369 | 478 | 10,856 | 285 | 779 | 27 | 1 | 11 | 147,574 |
| 2027 | 135,175 | 1,370 | 481 | 11,025 | 288 | 793 | 27 | 1 | 11 | 149,170 |
| 2028 | 136,538 | 1,371 | 483 | 11,194 | 292 | 807 | 27 | 1 | 11 | 150,723 |
| 2029 | 137,860 | 1,372 | 486 | 11,362 | 295 | 821 | 27 | 1 | 11 | 152,234 |
| 2030 | 139,138 | 1,373 | 488 | 11,527 | 300 | 835 | 27 | 1 | 11 | 153,699 |
| 2031 | 140,377 | 1,374 | 491 | 11,691 | 302 | 850 | 27 | 1 | 11 | 155,123 |
| 2032 | 141,577 | 1,375 | 493 | 11,854 | 307 | 865 | 27 | 1 | 11 | 156,508 |
| 2033 | 142,739 | 1,376 | 496 | 12,016 | 310 | 880 | 27 | 1 | 11 | 157,856 |
| 2034 | 143,865 | 1,377 | 498 | 12,177 | 314 | 895 | 27 | 1 | 11 | 159,164 |
| 2035 | 144,952 | 1,378 | 501 | 12,337 | 317 | 911 | 27 | 1 | 11 | 160,434 |
| 2036 | 146,007 | 1,379 | 503 | 12,495 | 320 | 927 | 27 | 1 | 11 | 161,670 |
| 2037 | 147,056 | 1,380 | 506 | 12,654 | 323 | 943 | 27 | 1 | 11 | 162,900 |
| 2038 | 148,102 | 1,381 | 508 | 12,811 | 326 | 960 | 27 | 1 | 11 | 164,126 |
| 2039 | 149,144 | 1,382 | 511 | 12,967 | 328 | 977 | 27 | 1 | 11 | 165,347 |
| 2040 | 150,184 | 1,383 | 513 | 13,122 | 332 | 994 | 27 | 1 | 11 | 166,567 |
| 2041 | 151,216 | 1,384 | 516 | 13,279 | 334 | 1,011 | 27 | 1 | 11 | 167,778 |
| 2042 | 152,239 | 1,385 | 518 | 13,433 | 337 | 1,029 | 27 | 1 | 11 | 168,979 |
| Average Annual Growth Rates | | | | | | | | | | |
| 1983-2012 | 2.1% | -4.4% | 1.9% | 2.1% | 4.7% | 3.6% | -4.8% | 0.0% | 0.2% | 1.9% |
| 1997-2012 | 2.5% | -9.0% | 0.2% | 1.9% | 4.8% | 3.4% | -9.0% | 0.0% | -0.2% | 2.1% |
| 2002-2012 | 2.3% | -12.1% | 1.9% | 3.5% | 6.5% | 4.6% | 0.4% | 0.0% | -0.3% | 2.0% |
| 2007-2012 | 1.5% | -12.4% | 0.9% | 2.6% | 7.1% | 3.7% | -0.5% | 0.0% | 1.9% | 1.3% |
| 2012-2017 | 1.6% | 0.1% | 0.8% | 1.9% | 2.5% | 1.8% | 0.0% | 0.0% | 0.0% | 1.6% |
| 2012-2022 | 1.5% | 0.1% | 0.8% | 1.9% | 2.2% | 1.8% | 0.0% | 0.0% | 0.0% | 1.5% |
| 2012-2032 | 1.3% | 0.1% | 0.6% | 1.7% | 1.7% | 1.8% | 0.0% | 0.0% | 0.0% | 1.3% |
| 2012-2042 | 1.1% | 0.1% | 0.6% | 1.6% | 1.5% | 1.8% | 0.0% | 0.0% | 0.0% | 1.1% |
| 2013-2042 | 1.1% | 0.1% | 0.6% | 1.6% | 1.5% | 1.8% | 0.0% | 0.0% | 0.0% | 1.1% |

Table 3.20

NMPA Energy Purchases Summary
Northern Municipal Power Agency

| <u>Year</u> | <u>Retail MWh Sales</u> | <u>Losses</u> | <u>Percent %</u> | <u>NMPA Purchases</u> |
|-----------------------------|-----------------------------|---------------|------------------|---------------------------|
| 1990 | | | | 363,032 |
| 1991 | | | | 382,175 |
| 1992 | | | | 372,754 |
| 1993 | | | | 391,546 |
| 1994 | | | | 407,465 |
| 1995 | 407,069 | 21,566 | 5.0% | 428,635 |
| 1996 | 420,021 | 26,061 | 5.8% | 446,082 |
| 1997 | 402,992 | 29,833 | 6.9% | 432,825 |
| 1998 | 407,631 | 19,806 | 4.6% | 427,437 |
| 1999 | 421,947 | 20,427 | 4.6% | 442,374 |
| 2000 | 423,750 | 21,371 | 4.8% | 445,121 |
| 2001 | 439,209 | 20,748 | 4.5% | 459,957 |
| 2002 | 450,474 | 22,431 | 4.7% | 472,905 |
| 2003 | 448,731 | 25,078 | 5.3% | 473,809 |
| 2004 | 454,427 | 19,370 | 4.1% | 473,797 |
| 2005 | 457,397 | 22,243 | 4.6% | 479,640 |
| 2006 | 462,825 | 22,392 | 4.6% | 485,217 |
| 2007 | 464,865 | 28,368 | 5.8% | 493,233 |
| 2008 | 458,871 | 27,691 | 5.7% | 486,562 |
| 2009 | 449,921 | 24,746 | 5.2% | 474,666 |
| 2010 | 441,782 | 19,645 | 4.3% | 461,427 |
| 2011 | 442,428 | 17,357 | 3.8% | 459,785 |
| 2012 | 422,875 | 27,999 | 6.2% | 450,875 |
| 2013 | 437,210 | 23,164 | 5.0% | 460,374 |
| 2014 | 441,248 | 23,363 | 5.0% | 464,611 |
| 2015 | 444,344 | 23,527 | 5.0% | 467,871 |
| 2016 | 447,438 | 23,691 | 5.0% | 471,129 |
| 2017 | 450,469 | 23,854 | 5.0% | 474,323 |
| 2018 | 453,409 | 24,012 | 5.0% | 477,420 |
| 2019 | 456,273 | 24,165 | 5.0% | 480,438 |
| 2020 | 459,106 | 24,318 | 5.0% | 483,424 |
| 2021 | 461,950 | 24,472 | 5.0% | 486,422 |
| 2022 | 464,700 | 24,621 | 5.0% | 489,321 |
| 2023 | 467,389 | 24,767 | 5.0% | 492,156 |
| 2024 | 470,058 | 24,912 | 5.0% | 494,970 |
| 2025 | 472,728 | 25,057 | 5.0% | 497,785 |
| 2026 | 475,402 | 25,203 | 5.0% | 500,604 |
| 2027 | 478,089 | 25,349 | 5.0% | 503,438 |
| 2028 | 480,776 | 25,497 | 5.0% | 506,272 |
| 2029 | 483,499 | 25,646 | 5.0% | 509,144 |
| 2030 | 486,230 | 25,796 | 5.0% | 512,026 |
| 2031 | 488,975 | 25,946 | 5.0% | 514,921 |
| 2032 | 491,759 | 26,100 | 5.0% | 517,860 |
| 2033 | 494,572 | 26,255 | 5.0% | 520,828 |
| 2034 | 497,425 | 26,413 | 5.0% | 523,838 |
| 2035 | 500,323 | 26,573 | 5.0% | 526,896 |
| 2036 | 503,280 | 26,737 | 5.0% | 530,017 |
| 2037 | 506,318 | 26,906 | 5.0% | 533,224 |
| 2038 | 509,433 | 27,079 | 5.0% | 536,512 |
| 2039 | 512,642 | 27,258 | 5.0% | 539,899 |
| 2040 | 515,944 | 27,441 | 5.1% | 543,386 |
| 2041 | 519,298 | 27,629 | 5.1% | 546,927 |
| 2042 | 522,700 | 27,819 | 5.1% | 550,518 |
| Average Annual Growth Rates | | | | |
| 1997-2012 | 0.3% | -0.4% | | 0.3% |
| 2002-2012 | -0.6% | 2.2% | | -0.5% |
| 2007-2012 | -1.9% | -0.3% | | -1.8% |
| 2012-2017 | 1.3% | -3.2% | | 1.0% |
| 2012-2022 | 0.9% | -1.3% | | 0.8% |
| 2012-2032 | 0.8% | -0.4% | | 0.7% |
| 2012-2042 | 0.7% | 0.0% | | 0.7% |
| 2013-2042 | 0.6% | 0.6% | | 0.6% |

Table 3.21

Joint System Energy Requirements
MWh

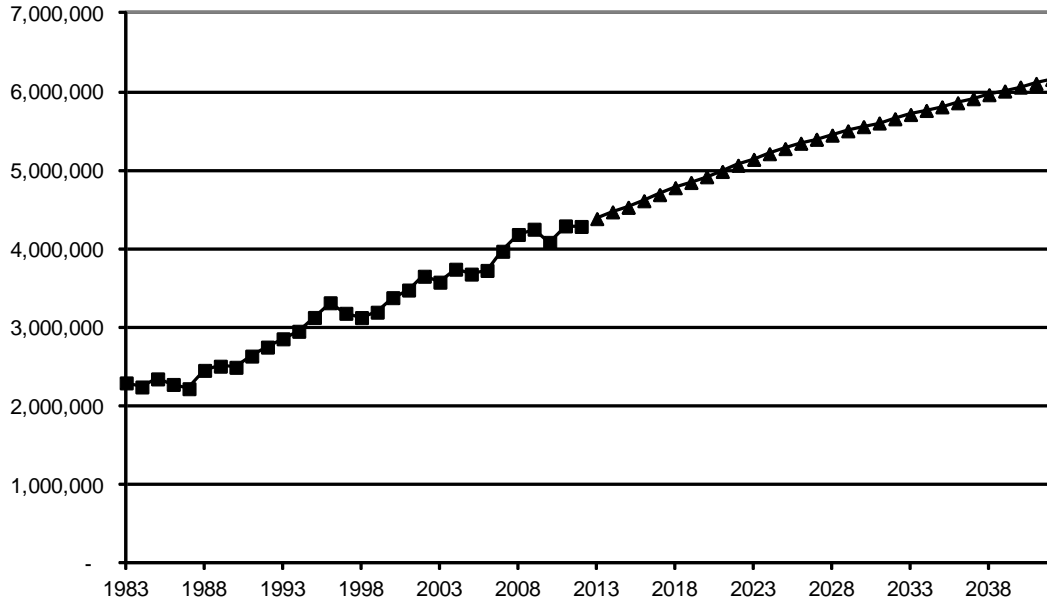
| <u>Year</u> | <u>Total Member Energy Requirements</u> | <u>Minnkota Losses</u> | <u>CAFS</u> | <u>Minnkota Total Requirements</u> | <u>NMPA Energy Requirements</u> | <u>Joint System Energy Requirements</u> |
|-----------------------------|---|------------------------|-------------|------------------------------------|---------------------------------|---|
| 1983 | 1,693,428 | 315,108 | 12,702 | 2,021,238 | 276,747 | 2,297,985 |
| 1984 | 1,732,374 | 209,371 | 13,278 | 1,955,023 | 291,481 | 2,246,504 |
| 1985 | 1,795,833 | 224,797 | 12,079 | 2,032,709 | 316,341 | 2,349,050 |
| 1986 | 1,750,845 | 190,234 | 11,867 | 1,952,946 | 325,970 | 2,278,916 |
| 1987 | 1,673,781 | 205,761 | 14,233 | 1,893,775 | 329,707 | 2,223,482 |
| 1988 | 1,838,947 | 246,728 | 14,641 | 2,100,316 | 357,429 | 2,457,745 |
| 1989 | 1,920,073 | 203,001 | 15,669 | 2,138,743 | 372,491 | 2,511,234 |
| 1990 | 1,860,324 | 257,656 | 16,063 | 2,134,043 | 363,032 | 2,497,075 |
| 1991 | 2,018,791 | 216,791 | 21,494 | 2,257,076 | 382,175 | 2,639,251 |
| 1992 | 2,017,999 | 315,258 | 47,384 | 2,380,641 | 372,754 | 2,753,395 |
| 1993 | 2,160,868 | 257,865 | 48,628 | 2,467,361 | 391,546 | 2,858,907 |
| 1994 | 2,228,292 | 268,455 | 50,341 | 2,547,088 | 407,465 | 2,954,553 |
| 1995 | 2,352,345 | 300,501 | 48,367 | 2,701,213 | 428,635 | 3,129,848 |
| 1996 | 2,488,710 | 335,722 | 47,402 | 2,871,834 | 446,082 | 3,317,916 |
| 1997 | 2,456,133 | 253,987 | 40,285 | 2,750,405 | 432,825 | 3,183,230 |
| 1998 | 2,347,968 | 322,015 | 31,101 | 2,701,084 | 427,437 | 3,128,521 |
| 1999 | 2,473,174 | 247,734 | 34,466 | 2,755,374 | 442,374 | 3,197,748 |
| 2000 | 2,553,456 | 348,169 | 36,080 | 2,937,705 | 445,121 | 3,382,826 |
| 2001 | 2,692,024 | 287,930 | 40,286 | 3,020,240 | 459,957 | 3,480,197 |
| 2002 | 2,865,734 | 274,732 | 41,806 | 3,182,272 | 472,905 | 3,655,177 |
| 2003 | 2,860,849 | 206,161 | 39,307 | 3,106,317 | 473,809 | 3,580,126 |
| 2004 | 2,930,437 | 301,596 | 38,706 | 3,270,740 | 473,797 | 3,744,537 |
| 2005 | 2,997,936 | 169,501 /1 | 35,335 /2 | 3,202,773 | 479,640 | 3,682,413 |
| 2006 | 3,080,882 | 162,899 | - | 3,243,781 | 485,217 | 3,728,998 |
| 2007 | 3,269,300 | 210,402 | - | 3,479,702 | 493,233 | 3,972,935 |
| 2008 | 3,460,221 | 239,589 | - | 3,699,810 | 486,562 | 4,186,372 |
| 2009 | 3,518,961 | 260,094 | - | 3,779,055 | 474,666 | 4,253,722 |
| 2010 | 3,425,669 | 199,285 | - | 3,624,954 | 461,427 | 4,086,381 |
| 2011 | 3,602,110 | 232,827 | - | 3,834,937 | 459,785 | 4,294,722 |
| 2012 | 3,556,036 | 281,871 | - | 3,837,907 | 450,875 | 4,288,782 |
| 2013 | 3,710,442 | 215,952 | - | 3,926,393 | 460,374 | 4,386,767 |
| 2014 | 3,787,366 | 220,429 | - | 4,007,794 | 464,611 | 4,472,405 |
| 2015 | 3,840,122 | 223,499 | - | 4,063,622 | 467,871 | 4,531,493 |
| 2016 | 3,915,718 | 227,899 | - | 4,143,617 | 471,129 | 4,614,746 |
| 2017 | 3,986,103 | 231,995 | - | 4,218,099 | 474,323 | 4,692,422 |
| 2018 | 4,065,969 | 236,644 | - | 4,302,613 | 477,420 | 4,780,033 |
| 2019 | 4,126,345 | 240,158 | - | 4,366,503 | 480,438 | 4,846,941 |
| 2020 | 4,191,988 | 243,978 | - | 4,435,966 | 483,424 | 4,919,390 |
| 2021 | 4,252,980 | 247,528 | - | 4,500,508 | 486,422 | 4,986,930 |
| 2022 | 4,325,392 | 251,742 | - | 4,577,134 | 489,321 | 5,066,455 |
| 2023 | 4,393,453 | 255,704 | - | 4,649,157 | 492,156 | 5,141,313 |
| 2024 | 4,458,147 | 259,469 | - | 4,717,616 | 494,970 | 5,212,585 |
| 2025 | 4,516,664 | 262,875 | - | 4,779,539 | 497,785 | 5,277,324 |
| 2026 | 4,578,999 | 266,503 | - | 4,845,501 | 500,604 | 5,346,105 |
| 2027 | 4,623,996 | 269,121 | - | 4,893,118 | 503,438 | 5,396,556 |
| 2028 | 4,671,285 | 271,874 | - | 4,943,159 | 506,272 | 5,449,431 |
| 2029 | 4,719,799 | 274,697 | - | 4,994,496 | 509,144 | 5,503,641 |
| 2030 | 4,767,469 | 277,472 | - | 5,044,941 | 512,026 | 5,556,967 |
| 2031 | 4,809,214 | 279,901 | - | 5,089,115 | 514,921 | 5,604,037 |
| 2032 | 4,856,735 | 282,667 | - | 5,139,402 | 517,860 | 5,657,261 |
| 2033 | 4,904,800 | 285,465 | - | 5,190,265 | 520,828 | 5,711,092 |
| 2034 | 4,950,946 | 288,150 | - | 5,239,096 | 523,838 | 5,762,934 |
| 2035 | 4,991,854 | 290,531 | - | 5,282,385 | 526,896 | 5,809,281 |
| 2036 | 5,037,346 | 293,179 | - | 5,330,525 | 530,017 | 5,860,542 |
| 2037 | 5,084,014 | 295,895 | - | 5,379,909 | 533,224 | 5,913,133 |
| 2038 | 5,128,436 | 298,480 | - | 5,426,916 | 536,512 | 5,963,428 |
| 2039 | 5,169,525 | 300,872 | - | 5,470,397 | 539,899 | 6,010,297 |
| 2040 | 5,213,950 | 303,457 | - | 5,517,408 | 543,386 | 6,060,794 |
| 2041 | 5,254,209 | 305,801 | - | 5,560,009 | 546,927 | 6,106,936 |
| 2042 | 5,298,268 | 308,365 | - | 5,606,633 | 550,518 | 6,157,151 |
| Average Annual Growth Rates | | | | | | |
| 1983-2012 | 2.6% | -0.4% | -100.0% | 2.2% | 1.7% | 2.2% |
| 1997-2012 | 2.5% | 0.7% | -100.0% | 2.2% | 0.3% | 2.0% |
| 2002-2012 | 2.2% | 0.3% | -100.0% | 1.9% | -0.5% | 1.6% |
| 2007-2012 | 1.7% | 6.0% | -- | 2.0% | -1.8% | 1.5% |
| 2012-2017 | 2.3% | -3.8% | -- | 1.9% | 1.0% | 1.8% |
| 2012-2022 | 2.0% | -1.1% | -- | 1.8% | 0.8% | 1.7% |
| 2012-2032 | 1.6% | 0.0% | -- | 1.5% | 0.7% | 1.4% |
| 2012-2042 | 1.3% | 0.3% | -- | 1.3% | 0.7% | 1.2% |
| 2013-2042 | 1.2% | 1.2% | -- | 1.2% | 0.6% | 1.2% |

/1 Losses reduced due to calculation adjustment - future loss % set at 5.5%

/2 Transferred to Nodak starting in 2006

Figure 3.2

Joint System Energy Requirements
MWh



3.4 Demand Forecasts – Joint System Seasonal Peaks

Demand, the instantaneous measurement on a system, tends to be volatile and heavily weather dependent. The demand measurements that are of particular importance are the Joint System winter and summer peak demands. The forecast for the winter and summer peak demands are based on the projected monthly peak demands developed for the individual member systems and NMPA using econometric modeling. The winter and summer peak demands presented here represent the expected peak demands for the Joint System.

Load factor has ranged from 53 percent to 59 percent in recent years based on the Joint System winter peak demands. As shown in Table 3.22, Joint System winter peak demand is projected to grow from 931 MW in 2013 to 1,245 MW by 2042. This is a 1.0 percent per year average annual increase during the forecast period of 2013-2042. The summer and winter peaks are expected to grow at roughly the same rate over the projection horizon.

Table 3.22

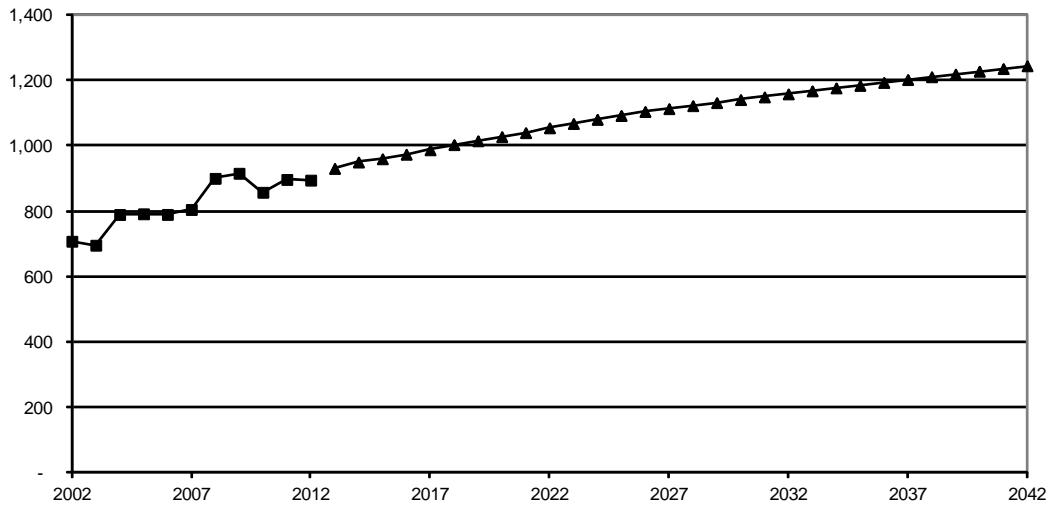
Joint System Peak Demand
MW

| <u>Year</u> | <u>Winter Peak Demand</u> | <u>Summer Peak Demand</u> | <u>Annual Peak Demand</u> | <u>Load Factor %</u> |
|-----------------------------|---------------------------|---------------------------|---------------------------|----------------------|
| 1997 | 663 | 369 | 663 | 55% |
| 1998 | 680 | 400 | 680 | 53% |
| 1999 | 709 | 414 | 709 | 51% |
| 2000 | 691 | 413 | 691 | 56% |
| 2001 | 696 | 437 | 696 | 57% |
| 2002 | 711 | 461 | 711 | 59% |
| 2003 | 699 | 514 | 699 | 58% |
| 2004 | 792 | 447 | 792 | 54% |
| 2005 | 788 | 482 | 788 | 53% |
| 2006 | 786 | 505 | 786 | 54% |
| 2007 | 806 | 521 | 806 | 56% |
| 2008 | 906 | 512 | 906 | 53% |
| 2009 | 917 | 506 | 917 | 53% |
| 2010 | 851 | 574 | 851 | 55% |
| 2011 | 897 | 574 | 897 | 55% |
| 2012 | 895 | 597 | 895 | 55% |
| 2013 | 931 | 571 | 931 | 54% |
| 2014 | 950 | 582 | 950 | 54% |
| 2015 | 960 | 589 | 960 | 54% |
| 2016 | 974 | 599 | 974 | 54% |
| 2017 | 988 | 608 | 988 | 54% |
| 2018 | 1,004 | 619 | 1,004 | 54% |
| 2019 | 1,015 | 627 | 1,015 | 54% |
| 2020 | 1,028 | 636 | 1,028 | 55% |
| 2021 | 1,040 | 644 | 1,040 | 55% |
| 2022 | 1,055 | 653 | 1,055 | 55% |
| 2023 | 1,068 | 662 | 1,068 | 55% |
| 2024 | 1,081 | 671 | 1,081 | 55% |
| 2025 | 1,093 | 678 | 1,093 | 55% |
| 2026 | 1,105 | 687 | 1,105 | 55% |
| 2027 | 1,114 | 693 | 1,114 | 55% |
| 2028 | 1,123 | 699 | 1,123 | 55% |
| 2029 | 1,132 | 706 | 1,132 | 56% |
| 2030 | 1,141 | 712 | 1,141 | 56% |
| 2031 | 1,149 | 718 | 1,149 | 56% |
| 2032 | 1,159 | 724 | 1,159 | 56% |
| 2033 | 1,168 | 730 | 1,168 | 56% |
| 2034 | 1,177 | 737 | 1,177 | 56% |
| 2035 | 1,185 | 742 | 1,185 | 56% |
| 2036 | 1,194 | 748 | 1,194 | 56% |
| 2037 | 1,203 | 754 | 1,203 | 56% |
| 2038 | 1,211 | 760 | 1,211 | 56% |
| 2039 | 1,219 | 766 | 1,219 | 56% |
| 2040 | 1,228 | 772 | 1,228 | 56% |
| 2041 | 1,236 | 777 | 1,236 | 56% |
| 2042 | 1,245 | 783 | 1,245 | 56% |
| Average Annual Growth Rates | | | | |
| 1997-2012 | 2.0% | 3.3% | 2.0% | |
| 2002-2012 | 2.3% | 2.6% | 2.3% | |
| 2007-2012 | 2.1% | 2.8% | 2.1% | |
| 2012-2017 | 2.0% | 0.4% | 2.0% | |
| 2012-2022 | 1.7% | 0.9% | 1.7% | |
| 2012-2032 | 1.3% | 1.0% | 1.3% | |
| 2012-2042 | 1.1% | 0.9% | 1.1% | |
| 2013-2042 | 1.0% | 1.1% | 1.0% | |

Based on MAPP Form 3 Peak with WAPA allocations

Figure 3.3

Joint System Peak Demand (Winter)
MW



SECTION 4

**FORECAST
UNCERTAINTY ANALYSIS**

Section 4

Forecast Uncertainty Analysis

4.1 Background

While the projections summarized in previous sections should be viewed as the most probable outcome, it is important to remember that energy loads can be influenced by factors that are inherently difficult to predict, such as weather and the economy. Forecasting attempts to model reality and identify the primary drivers of growth and change. Each forecast has an inherent error tolerance between which actual observed outcomes are likely to fall. Therefore, it is important to develop flexible plans for meeting future energy needs based on a range of forecast outcomes.

The base projections summarized in Section 3 should be viewed as one of many possible future outcomes. This section develops several scenarios and recommended planning ranges for the Joint System total energy requirements and annual peak demand. The resulting ranges are the sum of the member system scenario ranges developed in the individual member system reports. The study includes scenario analyses that show how the forecasts change under assumed variations in future weather and economic growth paths. The alternate growth scenarios that have been explored are:

1. Severe weather with normal economic growth
2. Mild weather with normal economic growth
3. Rapid economic growth with normal weather
4. Slow economic growth with normal weather

These scenarios present extreme ranges of growth possibilities while the base forecast represents the most probable predictions of energy use and peak demands. The assumptions used to define the alternative scenarios are described in the following discussions.

4.2 Weather Scenarios

4.2.1 Methodology

Weather is one of the critical components to explain year-to-year variation in the Joint System electric load. Because of this, severe and mild weather scenarios were developed for the forecast period. The severe and mild weather scenarios were based on the twenty-year long-term maximum and twenty-year long-term minimum annual cooling and heating degree-days, respectively.

4.2.2 Severe and Mild Weather Scenarios

Energy

Forecast models presented in Section 3 that were weather sensitive (i.e. had cooling or heating degree-days as an input) were revised using the severe and mild weather scenario inputs from the method described in Section 4.2. This includes the residential and small commercial equations in most cases. The remaining classes and customer forecasts were assumed to not be weather sensitive. The resulting severe and mild weather scenarios for total energy requirements are expected to diverge +/-5 percent over the base projection by 2042. This scenario is presented in Table 4.1 and Figure 4.1.

Demand

The severe and mild weather Joint System peak demand scenario was developed by applying the base case system load factor to the severe and mild weather energy requirements forecast described above. Table 4.2 and Figure 4.2 present the severe and mild weather peak demand scenarios. This forecast indicates that the Joint System peak demand would range from 1,141 to 1,354 MW by 2042, given the assumptions mentioned herein.

Table 4.1

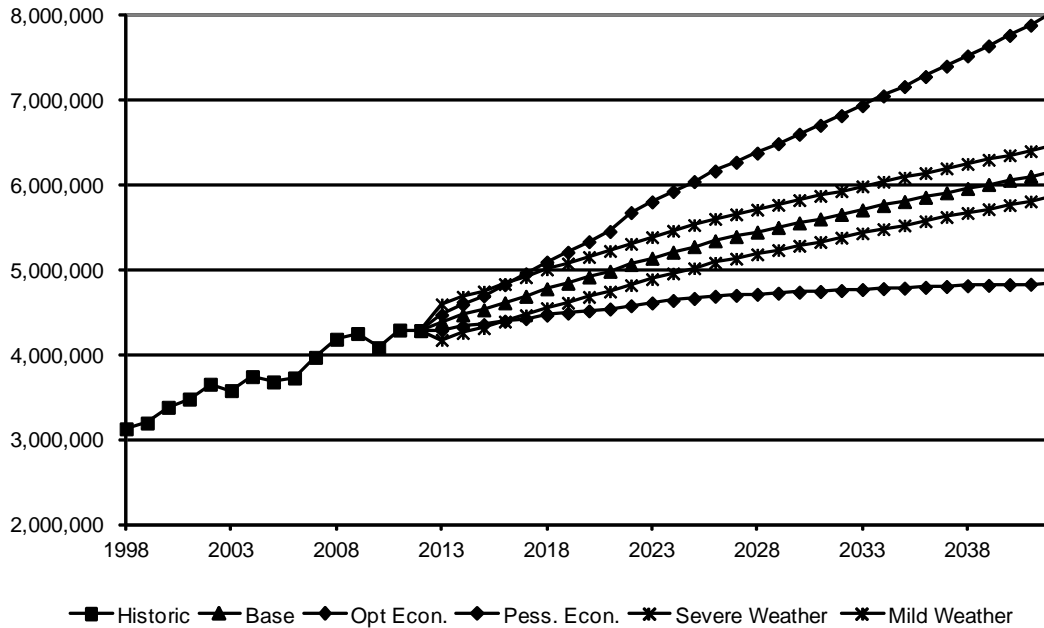
Joint System Energy Requirements Scenarios
MWh

| <u>Year</u> | <u>Base /1 Energy Requirements</u> | <u>Optimistic Economic</u> | <u>Pessimistic Economic</u> | <u>Extreme Weather</u> | <u>Mild Weather</u> |
|-----------------------------|--|--------------------------------|---------------------------------|----------------------------|-------------------------|
| 1983 | 2,297,985 | | | | |
| 1984 | 2,246,504 | | | | |
| 1985 | 2,349,050 | | | | |
| 1986 | 2,278,916 | | | | |
| 1987 | 2,223,482 | | | | |
| 1988 | 2,457,745 | | | | |
| 1989 | 2,511,234 | | | | |
| 1990 | 2,497,075 | | | | |
| 1991 | 2,639,251 | | | | |
| 1992 | 2,753,395 | | | | |
| 1993 | 2,858,907 | | | | |
| 1994 | 2,954,553 | | | | |
| 1995 | 3,129,848 | | | | |
| 1996 | 3,317,916 | | | | |
| 1997 | 3,183,230 | | | | |
| 1998 | 3,128,521 | | | | |
| 1999 | 3,197,748 | | | | |
| 2000 | 3,382,826 | | | | |
| 2001 | 3,480,197 | | | | |
| 2002 | 3,655,177 | | | | |
| 2003 | 3,580,126 | | | | |
| 2004 | 3,744,537 | | | | |
| 2005 | 3,682,413 | | | | |
| 2006 | 3,728,998 | | | | |
| 2007 | 3,972,935 | | | | |
| 2008 | 4,186,372 | | | | |
| 2009 | 4,253,722 | | | | |
| 2010 | 4,086,381 | | | | |
| 2011 | 4,294,722 | | | | |
| 2012 | 4,288,782 | 4,288,782 | 4,288,782 | 4,288,782 | 4,288,782 |
| 2013 | 4,386,767 | 4,473,236 | 4,291,451 | 4,597,501 | 4,177,282 |
| 2014 | 4,472,405 | 4,596,800 | 4,339,686 | 4,686,999 | 4,259,101 |
| 2015 | 4,531,493 | 4,698,077 | 4,358,385 | 4,749,097 | 4,315,186 |
| 2016 | 4,614,746 | 4,829,367 | 4,399,040 | 4,836,324 | 4,394,548 |
| 2017 | 4,692,422 | 4,957,294 | 4,429,451 | 4,917,257 | 4,468,993 |
| 2018 | 4,780,033 | 5,095,900 | 4,470,187 | 5,008,604 | 4,552,938 |
| 2019 | 4,846,941 | 5,211,557 | 4,493,739 | 5,079,174 | 4,616,239 |
| 2020 | 4,919,390 | 5,336,252 | 4,520,475 | 5,155,606 | 4,684,735 |
| 2021 | 4,986,930 | 5,457,209 | 4,542,518 | 5,227,132 | 4,748,311 |
| 2022 | 5,066,455 | 5,680,093 | 4,580,454 | 5,310,803 | 4,823,748 |
| 2023 | 5,141,313 | 5,805,663 | 4,613,617 | 5,389,874 | 4,894,417 |
| 2024 | 5,212,585 | 5,928,673 | 4,643,088 | 5,464,755 | 4,962,084 |
| 2025 | 5,277,324 | 6,045,722 | 4,666,933 | 5,533,029 | 5,023,311 |
| 2026 | 5,346,105 | 6,169,616 | 4,692,983 | 5,605,347 | 5,088,594 |
| 2027 | 5,396,556 | 6,273,401 | 4,703,707 | 5,658,575 | 5,136,307 |
| 2028 | 5,449,431 | 6,381,265 | 4,715,871 | 5,714,064 | 5,186,610 |
| 2029 | 5,503,641 | 6,492,568 | 4,729,027 | 5,771,178 | 5,237,957 |
| 2030 | 5,556,967 | 6,603,912 | 4,741,317 | 5,827,116 | 5,288,708 |
| 2031 | 5,604,037 | 6,709,231 | 4,748,589 | 5,876,686 | 5,333,321 |
| 2032 | 5,657,261 | 6,823,034 | 4,760,323 | 5,932,509 | 5,384,017 |
| 2033 | 5,711,092 | 6,940,316 | 4,772,150 | 5,989,149 | 5,435,065 |
| 2034 | 5,762,934 | 7,055,749 | 4,782,763 | 6,043,428 | 5,484,514 |
| 2035 | 5,809,281 | 7,166,141 | 4,788,464 | 6,092,159 | 5,528,504 |
| 2036 | 5,860,542 | 7,284,356 | 4,798,086 | 6,145,807 | 5,577,396 |
| 2037 | 5,913,133 | 7,406,990 | 4,807,802 | 6,201,060 | 5,627,357 |
| 2038 | 5,963,428 | 7,527,287 | 4,816,343 | 6,253,665 | 5,675,369 |
| 2039 | 6,010,297 | 7,645,689 | 4,821,663 | 6,302,915 | 5,719,857 |
| 2040 | 6,060,794 | 7,769,801 | 4,829,995 | 6,355,716 | 5,768,070 |
| 2041 | 6,106,936 | 7,890,278 | 4,834,541 | 6,404,172 | 5,811,912 |
| 2042 | 6,157,151 | 8,017,730 | 4,842,074 | 6,456,665 | 5,859,864 |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 2.2% | | | | |
| 1997-2012 | 2.0% | | | | |
| 2002-2012 | 1.6% | | | | |
| 2007-2012 | 1.5% | | | | |
| 2012-2017 | 1.8% | 2.9% | 0.6% | 2.8% | 0.8% |
| 2012-2022 | 1.7% | 2.8% | 0.7% | 2.2% | 1.2% |
| 2012-2032 | 1.4% | 2.3% | 0.5% | 1.6% | 1.1% |
| 2012-2042 | 1.2% | 2.1% | 0.4% | 1.4% | 1.0% |
| 2013-2042 | 1.2% | 2.0% | 0.4% | 1.2% | 1.2% |
| 2042 Index | 1.00 | 1.30 | 0.79 | 1.05 | 0.95 |

/1 Assumes normal weather and basecase economic assumptions

Figure 4.1

Joint System Energy Requirements Scenarios
MWh



4.3 Economic Scenarios

4.3.1 Methodology

Forecast ranges for demographic and economic variables have been developed using the following method:

- A rolling five- or ten-year average annual growth rate is calculated for the historic economic or demographic series depending on the historic volatility of the series.
- The standard deviation of this series is calculated.
- The projected growth rate is perturbed by plus or minus one historic standard deviation.

These high and low growth rates were then used to forecast the independent variables. The scenarios with the new values for the independent variables were used in place of the original data within the econometric models of Section 3 to generate appropriate confidence intervals.

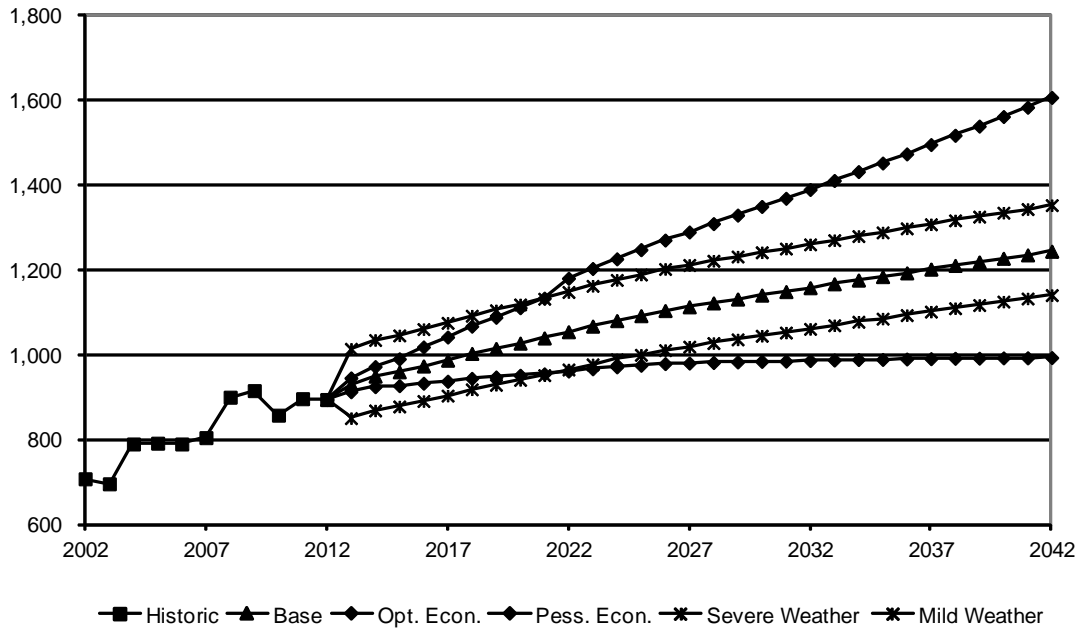
Table 4.2

Joint System Peak Demand Scenarios
MW

| <u>Year</u> | <u>(Annual)</u> | | | | | <u>Summer Peak</u> | <u>Optimistic Economic</u> | <u>Pessimistic Economic</u> | <u>Extreme Weather</u> | <u>Mild Weather</u> |
|-----------------------------|--------------------|----------------------------|-----------------------------|------------------------|---------------------|--------------------|----------------------------|-----------------------------|------------------------|---------------------|
| | <u>Winter Peak</u> | <u>Optimistic Economic</u> | <u>Pessimistic Economic</u> | <u>Extreme Weather</u> | <u>Mild Weather</u> | | | | | |
| 1995 | - | | | | | - | | | | |
| 1996 | - | | | | | - | | | | |
| 1997 | - | | | | | - | | | | |
| 1998 | - | | | | | - | | | | |
| 1999 | - | | | | | - | | | | |
| 2000 | 692 | | | | | 412 | | | | |
| 2001 | 707 | | | | | 450 | | | | |
| 2002 | 708 | | | | | 459 | | | | |
| 2003 | 696 | | | | | 511 | | | | |
| 2004 | 790 | | | | | 495 | | | | |
| 2005 | 792 | | | | | 486 | | | | |
| 2006 | 790 | | | | | 509 | | | | |
| 2007 | 805 | | | | | 522 | | | | |
| 2008 | 900 | | | | | 514 | | | | |
| 2009 | 916 | | | | | 533 | | | | |
| 2010 | 858 | | | | | 574 | | | | |
| 2011 | 897 | | | | | 573 | | | | |
| 2012 | 895 | 895 | 895 | 895 | 895 | 597 | 597 | 597 | 597 | 597 |
| 2013 | 931 | 946 | 913 | 1,015 | 851 | 571 | 581 | 561 | 623 | 522 |
| 2014 | 950 | 973 | 925 | 1,035 | 869 | 582 | 595 | 566 | 634 | 532 |
| 2015 | 960 | 991 | 928 | 1,046 | 879 | 589 | 608 | 569 | 642 | 539 |
| 2016 | 974 | 1,019 | 933 | 1,061 | 891 | 599 | 626 | 574 | 652 | 548 |
| 2017 | 988 | 1,042 | 938 | 1,076 | 904 | 608 | 642 | 578 | 663 | 557 |
| 2018 | 1,004 | 1,068 | 945 | 1,093 | 919 | 619 | 659 | 583 | 674 | 567 |
| 2019 | 1,015 | 1,089 | 948 | 1,105 | 930 | 627 | 673 | 586 | 683 | 574 |
| 2020 | 1,028 | 1,112 | 952 | 1,119 | 941 | 636 | 688 | 589 | 693 | 582 |
| 2021 | 1,040 | 1,134 | 956 | 1,133 | 952 | 644 | 702 | 592 | 701 | 590 |
| 2022 | 1,055 | 1,181 | 962 | 1,149 | 966 | 653 | 732 | 596 | 712 | 598 |
| 2023 | 1,068 | 1,204 | 967 | 1,163 | 978 | 662 | 747 | 600 | 721 | 606 |
| 2024 | 1,081 | 1,227 | 972 | 1,177 | 990 | 671 | 761 | 603 | 730 | 614 |
| 2025 | 1,093 | 1,249 | 976 | 1,190 | 1,000 | 678 | 775 | 606 | 739 | 621 |
| 2026 | 1,105 | 1,271 | 980 | 1,203 | 1,012 | 687 | 790 | 609 | 748 | 629 |
| 2027 | 1,114 | 1,290 | 981 | 1,212 | 1,020 | 693 | 803 | 610 | 754 | 634 |
| 2028 | 1,123 | 1,310 | 982 | 1,222 | 1,028 | 699 | 816 | 612 | 761 | 640 |
| 2029 | 1,132 | 1,330 | 984 | 1,232 | 1,037 | 706 | 829 | 613 | 768 | 646 |
| 2030 | 1,141 | 1,350 | 985 | 1,242 | 1,045 | 712 | 842 | 615 | 775 | 652 |
| 2031 | 1,149 | 1,370 | 986 | 1,251 | 1,053 | 718 | 855 | 615 | 781 | 657 |
| 2032 | 1,159 | 1,390 | 987 | 1,261 | 1,062 | 724 | 869 | 617 | 788 | 663 |
| 2033 | 1,168 | 1,412 | 988 | 1,271 | 1,070 | 730 | 883 | 618 | 795 | 669 |
| 2034 | 1,177 | 1,433 | 989 | 1,281 | 1,078 | 737 | 897 | 619 | 802 | 675 |
| 2035 | 1,185 | 1,453 | 990 | 1,289 | 1,086 | 742 | 910 | 620 | 807 | 680 |
| 2036 | 1,194 | 1,474 | 991 | 1,299 | 1,094 | 748 | 924 | 621 | 814 | 686 |
| 2037 | 1,203 | 1,496 | 991 | 1,308 | 1,102 | 754 | 939 | 622 | 821 | 691 |
| 2038 | 1,211 | 1,518 | 992 | 1,318 | 1,110 | 760 | 953 | 623 | 827 | 697 |
| 2039 | 1,219 | 1,540 | 992 | 1,326 | 1,118 | 766 | 967 | 623 | 833 | 702 |
| 2040 | 1,228 | 1,563 | 993 | 1,336 | 1,126 | 772 | 982 | 624 | 839 | 708 |
| 2041 | 1,236 | 1,584 | 993 | 1,344 | 1,133 | 777 | 996 | 625 | 845 | 713 |
| 2042 | 1,245 | 1,608 | 994 | 1,354 | 1,141 | 783 | 1,011 | 625 | 852 | 718 |
| Average Annual Growth Rates | | | | | | | | | | |
| 1995-2012 | -- | | | | | -- | | | | |
| 2002-2012 | 2.4% | | | | | 2.7% | | | | |
| 2007-2012 | 2.1% | | | | | 2.7% | | | | |
| 2012-2017 | 2.0% | 3.1% | 0.9% | 3.7% | 0.2% | 0.4% | 1.5% | -0.7% | 2.1% | -1.4% |
| 2012-2022 | 1.7% | 2.8% | 0.7% | 2.5% | 0.8% | 0.9% | 2.1% | 0.0% | 1.8% | 0.0% |
| 2012-2032 | 1.3% | 2.2% | 0.5% | 1.7% | 0.9% | 1.0% | 1.9% | 0.2% | 1.4% | 0.5% |
| 2012-2042 | 1.1% | 2.0% | 0.4% | 1.4% | 0.8% | 0.9% | 1.8% | 0.2% | 1.2% | 0.6% |
| 2013-2042 | 1.0% | 1.8% | 0.3% | 1.0% | 1.0% | 1.1% | 1.9% | 0.4% | 1.1% | 1.1% |
| 2042 Index | 1.00 | 1.29 | 0.80 | 1.09 | 0.92 | 1.00 | 1.29 | 0.80 | 1.09 | 0.92 |

Figure 4.2

**Joint System Peak Demand Scenarios
MW**



4.3.2 Optimistic and Pessimistic Economic Scenarios

To develop optimistic and pessimistic economic scenarios, the economic-related independent variables included in the models used to create the forecasts in Section 3 were altered to reflect a high rate of local economic growth. Where econometric models were not used to create consumer class energy models, judgmental methods were used to project a high growth rate for a particular consumer class. Optimistic growth rates for the residential and commercial classes were aggregated with any unaltered class forecasts and the system own use and losses forecasts to arrive at an optimistic and pessimistic total energy requirements forecast. The result is an upper and lower confidence limit for energy sales based on varying economic growth.

Energy

The energy sales projections were developed as the product of customers and average energy use. Economic and demographic inputs to both forecasts were altered to reflect optimistic and pessimistic growth scenarios. In the case of residential consumers, the population and number of household forecasts for each member system's service

territory were varied to reflect higher and lower growth, as is the case in any area experiencing economic prosperity or decline.

Other changes made include the use of favorable (lower) and unfavorable (higher) electric prices, yielding higher or lower consumption and alternate fuel prices that discourage or encourage fuel switching. Space heat and air conditioning saturation forecasts were revised using higher household estimates. Other variable were adjusted for optimistic and pessimistic economic outlooks. The commercial classes were also adjusted for stronger economic growth. The remaining classes were not adjusted for the alternate growth scenario.

The result of the optimistic and pessimistic economic scenarios for energy requirements is shown in Table 4.1. This forecast indicates Joint System energy requirements could range -21 to +30 percent by 2042, given the assumptions mentioned above.

Demand

To develop the corresponding peak demand forecast, the base case system load factor was applied to the optimistic and pessimistic economic energy requirements forecasts described above. The result of the economic scenarios for peak demand is shown in Table 4.2. The forecasts indicate the Joint System peak demand would range 994 to 1,608 MW by 2042, given the assumptions mentioned herein.

4.4 Recommended Planning Ranges

4.4.1 Methodology

The ranges developed above provide a useful reference for differentiating between the inherent risk associated with weather related and economic and demographic forecast drivers. However, the Joint System will almost certainly see both weather and economic related factors in any given year. Furthermore, the likelihood of ten years of strong or weak economic growth is less likely than a few years of each given economic business cycles. As a result, recommended planning ranges have been developed to provide a risk management approach to bounding the base case forecast.

The method used employed Monte Carlo simulation to pick the most-probable high and low ranges in select years (2013, 2020, 2030 and 2042) based using the high and low economic and weather ranges developed above.

4.4.1 Planning Ranges

The resulting planning ranges scenarios for total energy requirements and peak demand are expected to deviate from the base projection by approximately -10 to +15 percent in 2042. This scenario is presented in Table 4.3 and Figure 4.3.

Figure 4.3

Joint System Forecast - Most Probable Ranges
MWh

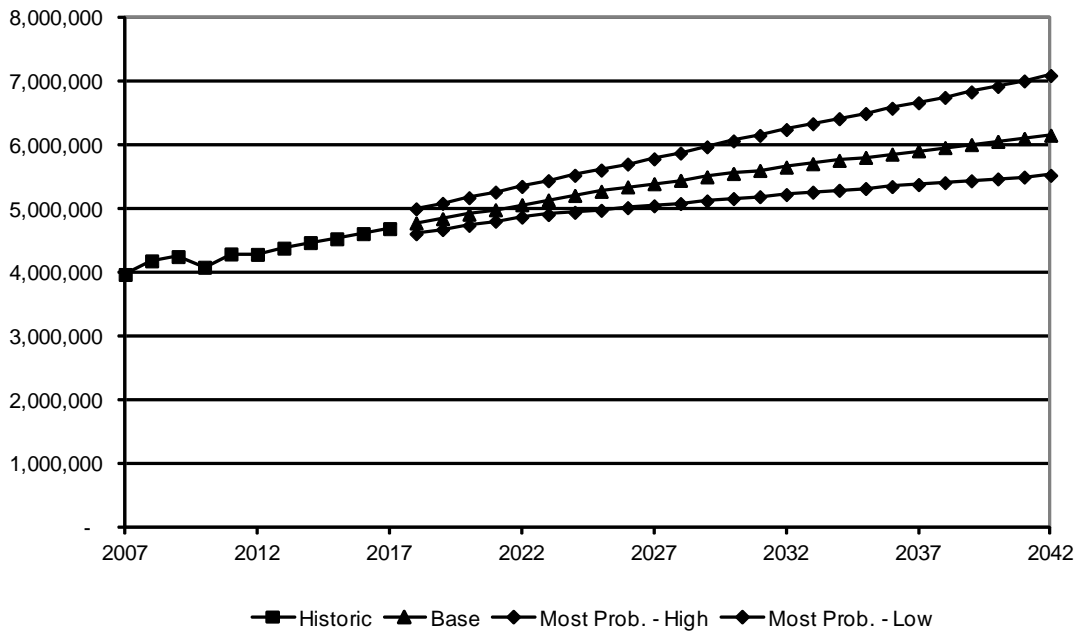


Table 4.3

Joint System Forecast - Most Probable Ranges

| <u>Year</u> | <u>Base</u> <u>MWh</u> | <u>Most Prob.</u> <u>High</u> | <u>Most Prob.</u> <u>Low</u> | <u>Winter</u> <u>MW</u> | <u>Most Prob.</u> <u>High</u> | <u>Most Prob.</u> <u>Low</u> | <u>Summer</u> <u>MW</u> | <u>Most Prob.</u> <u>High</u> | <u>Most Prob.</u> <u>Low</u> |
|-----------------------------|---------------------------|----------------------------------|---------------------------------|----------------------------|----------------------------------|---------------------------------|----------------------------|----------------------------------|---------------------------------|
| 1983 | 2,297,985 | | | | | | | | |
| 1984 | 2,246,504 | | | | | | | | |
| 1985 | 2,349,050 | | | | | | | | |
| 1986 | 2,278,916 | | | | | | | | |
| 1987 | 2,223,482 | | | | | | | | |
| 1988 | 2,457,745 | | | | | | | | |
| 1989 | 2,511,234 | | | | | | | | |
| 1990 | 2,497,075 | | | | | | | | |
| 1991 | 2,639,251 | | | | | | | | |
| 1992 | 2,753,395 | | | | | | | | |
| 1993 | 2,858,907 | | | | | | | | |
| 1994 | 2,954,553 | | | | | | | | |
| 1995 | 3,129,848 | | | | | | | | |
| 1996 | 3,317,916 | | | | | | | | |
| 1997 | 3,183,230 | | | | | | | | |
| 1998 | 3,128,521 | | | | | | | | |
| 1999 | 3,197,748 | | | | | | | | |
| 2000 | 3,382,826 | | | 692 | | | 412 | | |
| 2001 | 3,480,197 | | | 707 | | | 450 | | |
| 2002 | 3,655,177 | | | 708 | | | 459 | | |
| 2003 | 3,580,126 | | | 696 | | | 511 | | |
| 2004 | 3,744,537 | | | 790 | | | 495 | | |
| 2005 | 3,682,413 | | | 792 | | | 486 | | |
| 2006 | 3,728,998 | | | 790 | | | 509 | | |
| 2007 | 3,972,935 | | | 805 | | | 522 | | |
| 2008 | 4,186,372 | | | 900 | | | 514 | | |
| 2009 | 4,253,722 | | | 916 | | | 533 | | |
| 2010 | 4,086,381 | | | 858 | | | 574 | | |
| 2011 | 4,294,722 | | | 897 | | | 573 | | |
| 2012 | 4,288,782 | 4,288,782 | 4,288,782 | 895 | 895 | 895 | 597 | 597 | 597 |
| 2013 | 4,386,767 | 4,539,087 | 4,252,969 | 931 | 980 | 884 | 571 | 603 | 542 |
| 2014 | 4,472,405 | 4,623,025 | 4,317,708 | 950 | 991 | 893 | 582 | 613 | 551 |
| 2015 | 4,531,493 | 4,691,212 | 4,367,324 | 960 | 1,005 | 906 | 589 | 620 | 557 |
| 2016 | 4,614,746 | 4,779,841 | 4,435,546 | 974 | 1,020 | 918 | 599 | 629 | 565 |
| 2017 | 4,692,422 | 4,884,807 | 4,518,397 | 988 | 1,033 | 930 | 608 | 640 | 575 |
| 2018 | 4,780,033 | 5,002,295 | 4,612,216 | 1,004 | 1,053 | 947 | 619 | 653 | 586 |
| 2019 | 4,846,941 | 5,089,381 | 4,677,444 | 1,015 | 1,069 | 961 | 627 | 662 | 594 |
| 2020 | 4,919,390 | 5,177,503 | 4,743,155 | 1,028 | 1,084 | 974 | 636 | 671 | 602 |
| 2021 | 4,986,930 | 5,266,091 | 4,808,821 | 1,040 | 1,097 | 985 | 644 | 680 | 610 |
| 2022 | 5,066,455 | 5,354,448 | 4,873,807 | 1,055 | 1,115 | 1,000 | 653 | 689 | 618 |
| 2023 | 5,141,313 | 5,444,375 | 4,914,066 | 1,068 | 1,131 | 1,010 | 662 | 699 | 624 |
| 2024 | 5,212,585 | 5,529,231 | 4,948,766 | 1,081 | 1,146 | 1,018 | 671 | 709 | 629 |
| 2025 | 5,277,324 | 5,611,046 | 4,979,840 | 1,093 | 1,160 | 1,026 | 678 | 718 | 634 |
| 2026 | 5,346,105 | 5,705,561 | 5,021,219 | 1,105 | 1,175 | 1,034 | 687 | 729 | 640 |
| 2027 | 5,396,556 | 5,787,276 | 5,050,382 | 1,114 | 1,188 | 1,040 | 693 | 738 | 645 |
| 2028 | 5,449,431 | 5,877,820 | 5,086,344 | 1,123 | 1,203 | 1,048 | 699 | 748 | 651 |
| 2029 | 5,503,641 | 5,976,054 | 5,127,943 | 1,132 | 1,219 | 1,056 | 706 | 759 | 657 |
| 2030 | 5,556,967 | 6,069,173 | 5,164,134 | 1,141 | 1,235 | 1,065 | 712 | 769 | 662 |
| 2031 | 5,604,037 | 6,155,517 | 5,193,640 | 1,149 | 1,250 | 1,072 | 718 | 778 | 667 |
| 2032 | 5,657,261 | 6,247,256 | 5,226,801 | 1,159 | 1,266 | 1,081 | 724 | 789 | 672 |
| 2033 | 5,711,092 | 6,337,804 | 5,265,006 | 1,168 | 1,280 | 1,084 | 730 | 799 | 676 |
| 2034 | 5,762,934 | 6,417,637 | 5,293,571 | 1,177 | 1,296 | 1,090 | 737 | 809 | 680 |
| 2035 | 5,809,281 | 6,498,143 | 5,322,018 | 1,185 | 1,309 | 1,092 | 742 | 818 | 683 |
| 2036 | 5,860,542 | 6,581,327 | 5,351,975 | 1,194 | 1,324 | 1,097 | 748 | 828 | 686 |
| 2037 | 5,913,133 | 6,667,100 | 5,383,331 | 1,203 | 1,339 | 1,101 | 754 | 838 | 689 |
| 2038 | 5,963,428 | 6,751,932 | 5,413,220 | 1,211 | 1,353 | 1,105 | 760 | 848 | 693 |
| 2039 | 6,010,297 | 6,837,524 | 5,443,020 | 1,219 | 1,368 | 1,108 | 766 | 858 | 696 |
| 2040 | 6,060,794 | 6,923,638 | 5,472,541 | 1,228 | 1,384 | 1,113 | 772 | 869 | 699 |
| 2041 | 6,106,936 | 7,009,937 | 5,501,514 | 1,236 | 1,398 | 1,116 | 777 | 879 | 702 |
| 2042 | 6,157,151 | 7,095,303 | 5,529,076 | 1,245 | 1,414 | 1,120 | 783 | 889 | 705 |
| Average Annual Growth Rates | | | | | | | | | |
| 1983-2012 | 2.2% | | | -- | | | -- | | |
| 1997-2012 | 2.0% | | | -- | | | -- | | |
| 2002-2012 | 1.6% | | | 2.4% | | | 2.7% | | |
| 2007-2012 | 1.5% | | | 2.1% | | | 2.7% | | |
| 2012-2017 | 1.8% | 2.6% | 1.0% | 2.0% | 2.9% | 0.8% | 0.4% | 1.4% | -0.7% |
| 2012-2022 | 1.7% | 2.2% | 1.3% | 1.7% | 2.2% | 1.1% | 0.9% | 1.4% | 0.3% |
| 2012-2032 | 1.4% | 1.9% | 1.0% | 1.3% | 1.7% | 0.9% | 1.0% | 1.4% | 0.6% |
| 2012-2042 | 1.2% | 1.7% | 0.9% | 1.1% | 1.5% | 0.8% | 0.9% | 1.3% | 0.6% |
| 2013-2042 | 1.2% | 1.6% | 0.9% | 1.0% | 1.3% | 0.8% | 1.1% | 1.3% | 0.9% |
| 2042 Index | 1.00 | 1.15 | 0.90 | 1.00 | 1.14 | 0.90 | 1.00 | 1.14 | 0.90 |

4.5 Minnesota CIP Scenario

4.5.1 Background

The Minnesota Conservation Improvement Plan is mandated by state law, and it requires utilities to invest a portion of revenues into energy efficiency and conservation programs. All utilities must develop their own conservation improvement plan. The goals of the utility programs are to raise awareness of energy conservation, reduce utility bills, and increase the usage of energy efficient technologies and products. Typical CIP projects include rebate programs for the purchase of new energy efficient appliances and/or lighting, rebates for energy efficient farm equipment, building design assistance, and grants or low interest loans for energy efficiency improvements. The purpose of the programs is to give consumers an incentive to conserve energy through behavioral changes or purchasing energy efficient appliances. Table 4.4 presents the retail sales forecast (kWh) over the thirty-year period, and the kWh Minnkota members are required to save through their CIP plan (1.5% of the three-year moving average of retail kWh sales). North Dakota members are exempt from this requirement.

Table 4.4

Joint System Retail Energy Forecasts (kWh) - CIP Scenario
Joint System

| Year | Base | CIP | | Adjusted | | |
|------|----------------------|-------------|-------------------|-----------|----------------------|-----------|
| | Retail | Requirement | Requirement | Retail | | |
| | <u>Forecast</u> | <u>/1</u> | <u>Forecast</u> | <u>/2</u> | <u>Forecast</u> | <u>/3</u> |
| 1992 | - | | | | | |
| 1993 | - | | | | | |
| 1994 | - | | | | | |
| 1995 | 2,625,365,646 | | | | | |
| 1996 | 2,802,247,475 | | | | | |
| 1997 | 2,731,587,513 | | | | | |
| 1998 | 2,651,475,812 | | | | | |
| 1999 | 2,782,916,217 | | | | | |
| 2000 | 2,859,765,949 | | | | | |
| 2001 | 3,009,139,019 | | | | | |
| 2002 | 3,167,876,012 | | | | | |
| 2003 | 3,171,772,344 | | | | | |
| 2004 | 3,237,968,057 | | | | | |
| 2005 | 3,296,638,386 | | | | | |
| 2006 | 3,395,904,400 | | | | | |
| 2007 | 3,573,892,566 | | | | | |
| 2008 | 3,731,948,209 | | | | | |
| 2009 | 3,796,592,035 | | 3,265,266 | | 3,799,857,301 | |
| 2010 | 3,709,481,446 | | 11,868,950 | | 3,721,350,396 | |
| 2011 | 3,890,908,441 | | 20,470,321 | | 3,911,378,762 | |
| 2012 | <u>3,828,166,152</u> | | <u>29,628,718</u> | | <u>3,857,794,870</u> | |
| 2013 | 3,987,899,158 | | 29,538,239 | | 4,017,437,397 | |
| 2014 | 4,065,996,825 | | 30,253,677 | | 4,096,250,501 | |
| 2015 | 4,119,802,719 | | 30,988,003 | | 4,150,790,722 | |
| 2016 | 4,195,674,372 | | 31,741,734 | | 4,227,416,107 | |
| 2017 | 4,266,279,190 | | 32,515,399 | | 4,298,794,588 | |
| 2018 | 4,345,844,008 | | 33,309,541 | | 4,379,153,550 | |
| 2019 | 4,406,782,670 | | 34,124,722 | | 4,440,907,392 | |
| 2020 | 4,472,753,086 | | 34,961,516 | | 4,507,714,602 | |
| 2021 | 4,534,003,033 | | 35,820,515 | | 4,569,823,548 | |
| 2022 | 4,605,986,058 | | 36,702,327 | | 4,642,688,384 | |
| 2023 | 4,673,998,638 | | 37,607,577 | | 4,711,606,214 | |
| 2024 | 4,738,653,210 | | 38,536,908 | | 4,777,190,118 | |
| 2025 | 4,797,389,589 | | 39,490,981 | | 4,836,880,570 | |
| 2026 | 4,859,917,541 | | 40,470,476 | | 4,900,388,017 | |
| 2027 | 4,905,828,753 | | 41,476,091 | | 4,947,304,844 | |
| 2028 | 4,953,979,089 | | 42,508,544 | | 4,996,487,634 | |
| 2029 | 5,003,396,079 | | 43,568,575 | | 5,046,964,654 | |
| 2030 | 5,051,935,260 | | 44,656,941 | | 5,096,592,201 | |
| 2031 | 5,094,806,842 | | 45,774,425 | | 5,140,581,267 | |
| 2032 | 5,143,237,972 | | 46,921,829 | | 5,190,159,801 | |
| 2033 | 5,192,313,594 | | 48,099,979 | | 5,240,413,573 | |
| 2034 | 5,239,516,315 | | 49,309,723 | | 5,288,826,038 | |
| 2035 | 5,281,730,927 | | 50,551,934 | | 5,332,282,861 | |
| 2036 | 5,328,422,226 | | 51,827,510 | | 5,380,249,735 | |
| 2037 | 5,376,384,172 | | 53,137,373 | | 5,429,521,546 | |
| 2038 | 5,422,209,853 | | 54,482,473 | | 5,476,692,326 | |
| 2039 | 5,464,888,277 | | 55,863,786 | | 5,520,752,063 | |
| 2040 | 5,510,901,885 | | 57,282,315 | | 5,568,184,199 | |
| 2041 | 5,552,935,566 | | 58,739,092 | | 5,611,674,658 | |
| 2042 | 5,598,695,846 | | 60,235,179 | | 5,658,931,024 | |

| Average Annual Growth Rates | | | |
|-----------------------------|------|------|------|
| 1997-2012 | -- | -- | -- |
| 2002-2012 | 1.9% | -- | -- |
| 2007-2012 | 1.4% | -- | -- |
| 2012-2017 | 2.2% | 1.9% | 2.2% |
| 2012-2022 | 1.9% | 2.2% | 1.9% |
| 2012-2032 | 1.5% | 2.3% | 1.5% |
| 2012-2042 | 1.3% | 2.4% | 1.3% |
| 2013-2042 | 1.2% | 2.5% | 1.2% |

/1 Base-case load forecast - joint system retail sales - excludes distribution and transmission losses - INCLUDES CIP savings

/2 CIP Requirement forecast - only MN co-ops adjusted

/3 Base retail forecast EXCLUDING estimated CIP kWh savings.

APPENDIX A
BOARD APPROVAL

APPENDIX B
FORECAST METHODOLOGY

Appendix B **Model Test Criteria**

The models developed and discussed in Section 3 use econometric modeling as the forecasting technique of choice. All models were selected on the basis of theoretical and statistical validity as well as the reasonableness of the forecast results generated.

The statistical validity of the models is determined by several criteria. A simple but important criterion is that the coefficient of each explanatory variable has the correct sign. For example, energy sales will generally increase as a consumer's income increases or during periods of colder or hotter weather (i.e., these variables should have positive coefficients). Conversely, energy sales generally decrease with increasing electricity prices (i.e., the coefficient of this variable should be negative).

Another important criterion is the fact that each explanatory variable should have a significant influence on the dependent variable. The statistical significance of an explanatory variable is measured by the t-statistic. The specific value of a particular t-statistic required for statistical significance depends on both the degrees of freedom (the number of data points less the number of variables) of the equations and desired level of confidence in the estimated coefficients. In general, however, the t-statistic should have a magnitude of at least 2.0 for a 95 percent level of confidence, and at least 1.5 for a 90 percent level of confidence.

Another important test is how the equation explains the historical variation in the dependent variable. Measures of this include the adjusted R-squared and the F-statistic. An adjusted R-squared value of 1 indicates that all of the variation is explained, whereas an adjusted R-squared value of zero indicates that none of the variation is explained. Generally, an equation with an adjusted R-squared greater than 0.80 is considered to be statistically adequate in explaining historical variation in the dependent variable, assuming the other validity measures described here are achieved.

The value of the F-statistic necessary for a statistically valid equation varies, like that of the t-statistic, with the number of degrees of freedom and the desired level of confidence. In general, however, for equations of the type used in this analysis, the F-

statistic should be at least 4.0 for a 95 percent level of confidence in the statistical validity of the equation.

Another validity criterion examines the equation residuals (the difference between the actual historical and estimated historical values). In a good equation, the residuals are randomly distributed and of approximately constant magnitude. This indicates that there is no pattern in the data that has not been explained by the equation. The Durbin-Watson statistic can be used to check the randomness of residuals. A Durbin-Watson statistic near 2.0 is generally indicative of random residuals.

The models developed must also pass a test of reasonableness. Models must make intuitive sense and the forecasts that result must be plausible given reasonable assumptions of growth factors.

For more detailed discussions of the methods described above, please consult, "Introductory Econometrics With Applications," Ramanathan, 1992, Dryden Press – HBJ.

Dependent Variable: BAGLEY+BAGLEYCIP
 Method: Least Squares
 Date: 08/08/13 Time: 11:07
 Sample (adjusted): 1995 2012
 Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -42219.95 | 9647.709 | -4.376163 | 0.0007 |
| HDD | 0.261747 | 0.169433 | 1.544840 | 0.1464 |
| HHW | 16.64624 | 3.470273 | 4.796809 | 0.0003 |
| PCI05W(-1) | 0.319609 | 0.132999 | 2.403103 | 0.0319 |
| D10ON_REV | -2805.882 | 437.9249 | -6.407223 | 0.0000 |
| R-squared | 0.963546 | Mean dependent var | | 27354.56 |
| Adjusted R-squared | 0.952329 | S.D. dependent var | | 2301.377 |
| S.E. of regression | 502.4746 | Akaike info criterion | | 15.50710 |
| Sum squared resid | 3282249. | Schwarz criterion | | 15.75443 |
| Log likelihood | -134.5639 | Hannan-Quinn criter. | | 15.54120 |
| F-statistic | 85.90306 | Durbin-Watson stat | | 1.826479 |
| Prob(F-statistic) | 0.000000 | | | |

Dependent Variable: BAUDETTE+BAUDETTECIP

Method: Least Squares

Date: 08/08/13 Time: 11:14

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 9734.043 | 4628.852 | 2.102907 | 0.0540 |
| TEMPW | 1.920852 | 0.757465 | 2.535895 | 0.0238 |
| D01ON_REV | 2465.787 | 251.0211 | 9.823026 | 0.0000 |
| D10ON | -790.4292 | 335.3377 | -2.357114 | 0.0335 |
| R-squared | 0.876211 | Mean dependent var | | 22829.78 |
| Adjusted R-squared | 0.849684 | S.D. dependent var | | 1105.396 |
| S.E. of regression | 428.5682 | Akaike info criterion | | 15.15191 |
| Sum squared resid | 2571390. | Schwarz criterion | | 15.34977 |
| Log likelihood | -132.3672 | Hannan-Quinn criter. | | 15.17919 |
| F-statistic | 33.03179 | Durbin-Watson stat | | 1.153526 |
| Prob(F-statistic) | 0.000001 | | | |

Dependent Variable: FOSSTON+FOSSTONCIP

Method: Least Squares

Date: 08/08/13 Time: 11:09

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 491.2543 | 14496.27 | 0.033888 | 0.9735 |
| HDD | 0.575305 | 0.254584 | 2.259785 | 0.0416 |
| HHW | 3.792493 | 5.214298 | 0.727326 | 0.4799 |
| PCI05W(-1) | 0.641339 | 0.199838 | 3.209289 | 0.0068 |
| D10ON_REV | -1942.246 | 658.0088 | -2.951701 | 0.0112 |
| R-squared | 0.886446 | Mean dependent var | | 34027.56 |
| Adjusted R-squared | 0.851506 | S.D. dependent var | | 1959.259 |
| S.E. of regression | 754.9987 | Akaike info criterion | | 16.32144 |
| Sum squared resid | 7410299. | Schwarz criterion | | 16.56877 |
| Log likelihood | -141.8930 | Hannan-Quinn criter. | | 16.35555 |
| F-statistic | 25.37071 | Durbin-Watson stat | | 1.973767 |
| Prob(F-statistic) | 0.000005 | | | |

Dependent Variable: GRAFTON

Method: Least Squares

Date: 08/07/13 Time: 19:49

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 43832.02 | 6738.630 | 6.504589 | 0.0000 |
| HDD | 0.840080 | 0.528219 | 1.590401 | 0.1358 |
| GRP05 | 17.57857 | 3.781823 | 4.648173 | 0.0005 |
| D97 | -11901.39 | 1440.931 | -8.259516 | 0.0000 |
| D08ON | -18068.71 | 1298.288 | -13.91734 | 0.0000 |
| R-squared | 0.969917 | Mean dependent var | | 67872.33 |
| Adjusted R-squared | 0.960661 | S.D. dependent var | | 6691.707 |
| S.E. of regression | 1327.246 | Akaike info criterion | | 17.44973 |
| Sum squared resid | 22900553 | Schwarz criterion | | 17.69706 |
| Log likelihood | -152.0476 | Hannan-Quinn criter. | | 17.48384 |
| F-statistic | 104.7839 | Durbin-Watson stat | | 1.786664 |
| Prob(F-statistic) | 0.000000 | | | |

Dependent Variable: HALSTAD+HALSTADCIP

Method: Least Squares

Date: 08/08/13 Time: 11:49

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 4269.094 | 806.8693 | 5.290936 | 0.0001 |
| HDD | 0.370025 | 0.075297 | 4.914216 | 0.0002 |
| TPI05W | 8.743427 | 1.769351 | 4.941602 | 0.0002 |
| R-squared | 0.741395 | Mean dependent var | | 9400.833 |
| Adjusted R-squared | 0.706914 | S.D. dependent var | | 430.1833 |
| S.E. of regression | 232.8900 | Akaike info criterion | | 13.89002 |
| Sum squared resid | 813566.0 | Schwarz criterion | | 14.03842 |
| Log likelihood | -122.0102 | Hannan-Quinn criter. | | 13.91048 |
| F-statistic | 21.50177 | Durbin-Watson stat | | 1.074125 |
| Prob(F-statistic) | 0.000039 | | | |

Dependent Variable: HAWLEY+HAWLEYCIP

Method: Least Squares

Date: 08/08/13 Time: 11:57

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -23782.43 | 4237.701 | -5.612107 | 0.0001 |
| HDD | 0.435375 | 0.232466 | 1.872851 | 0.0821 |
| HHW | 2.060976 | 1.352487 | 1.523841 | 0.1498 |
| TEMPW | 1.415604 | 0.721524 | 1.961964 | 0.0700 |
| R-squared | 0.917156 | Mean dependent var | | 19045.56 |
| Adjusted R-squared | 0.899403 | S.D. dependent var | | 1900.599 |
| S.E. of regression | 602.8125 | Akaike info criterion | | 15.83422 |
| Sum squared resid | 5087361. | Schwarz criterion | | 16.03208 |
| Log likelihood | -138.5080 | Hannan-Quinn criter. | | 15.86150 |
| F-statistic | 51.66390 | Durbin-Watson stat | | 0.848296 |
| Prob(F-statistic) | 0.000000 | | | |

Dependent Variable: PARKRIVER

Method: Least Squares

Date: 08/07/13 Time: 19:50

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -164.9645 | 3773.826 | -0.043713 | 0.9658 |
| HDD | 1.073548 | 0.239234 | 4.487435 | 0.0006 |
| CDD | 3.139964 | 0.986860 | 3.181773 | 0.0072 |
| CEMPW | 2.942970 | 0.966150 | 3.046081 | 0.0094 |
| FEMPW | 2.023419 | 0.627634 | 3.223886 | 0.0067 |
| R-squared | 0.745128 | Mean dependent var | | 20376.44 |
| Adjusted R-squared | 0.666706 | S.D. dependent var | | 806.2157 |
| S.E. of regression | 465.4413 | Akaike info criterion | | 15.35398 |
| Sum squared resid | 2816263. | Schwarz criterion | | 15.60131 |
| Log likelihood | -133.1858 | Hannan-Quinn criter. | | 15.38809 |
| F-statistic | 9.501508 | Durbin-Watson stat | | 1.877364 |
| Prob(F-statistic) | 0.000809 | | | |

Dependent Variable: ROSEAU+ROSEAUICIP

Method: Least Squares

Date: 08/08/13 Time: 12:02

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 8541.436 | 15366.82 | 0.555836 | 0.5885 |
| HDD | 0.843884 | 0.259533 | 3.251554 | 0.0069 |
| CDD | 3.072289 | 2.121411 | 1.448229 | 0.1732 |
| HHW | 3.108716 | 3.104127 | 1.001479 | 0.3364 |
| TPI05W(-1) | 24.69519 | 6.859711 | 3.600033 | 0.0036 |
| D12ON | -1574.021 | 787.6652 | -1.998338 | 0.0689 |
| R-squared | 0.862788 | Mean dependent var | | 43571.83 |
| Adjusted R-squared | 0.805617 | S.D. dependent var | | 1574.171 |
| S.E. of regression | 694.0346 | Akaike info criterion | | 16.18412 |
| Sum squared resid | 5780208. | Schwarz criterion | | 16.48091 |
| Log likelihood | -139.6571 | Hannan-Quinn criter. | | 16.22505 |
| F-statistic | 15.09123 | Durbin-Watson stat | | 1.306125 |
| Prob(F-statistic) | 0.000081 | | | |

Dependent Variable: STEPHEN+STEPHENCIP

Method: Least Squares

Date: 08/08/13 Time: 12:11

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -15252.65 | 13438.16 | -1.135025 | 0.2769 |
| HDD | 0.658700 | 0.222327 | 2.962758 | 0.0110 |
| CDD | 1.880232 | 1.116330 | 1.684297 | 0.1160 |
| HHW | 5.803827 | 4.282333 | 1.355296 | 0.1984 |
| TPI05W(-1) | 4.559599 | 7.159810 | 0.636832 | 0.5353 |
| R-squared | 0.580139 | Mean dependent var | | 9695.500 |
| Adjusted R-squared | 0.450951 | S.D. dependent var | | 668.4106 |
| S.E. of regression | 495.2780 | Akaike info criterion | | 15.47825 |
| Sum squared resid | 3188903. | Schwarz criterion | | 15.72557 |
| Log likelihood | -134.3042 | Hannan-Quinn criter. | | 15.51235 |
| F-statistic | 4.490653 | Durbin-Watson stat | | 1.070661 |
| Prob(F-statistic) | 0.016935 | | | |

Dependent Variable: THIEFRIVER+THIEFRIVERCIP

Method: Least Squares

Date: 08/09/13 Time: 14:29

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -62499.25 | 35236.85 | -1.773690 | 0.0995 |
| HDD | 3.437790 | 1.429722 | 2.404517 | 0.0318 |
| CDD | 8.603562 | 9.944085 | 0.865194 | 0.4026 |
| SEMPW | 80.25879 | 23.58009 | 3.403668 | 0.0047 |
| TPI05W | 56.48905 | 52.09288 | 1.084391 | 0.2979 |
| R-squared | 0.869376 | Mean dependent var | | 133032.2 |
| Adjusted R-squared | 0.829185 | S.D. dependent var | | 10007.30 |
| S.E. of regression | 4136.000 | Akaike info criterion | | 19.72298 |
| Sum squared resid | 2.22E+08 | Schwarz criterion | | 19.97030 |
| Log likelihood | -172.5068 | Hannan-Quinn criter. | | 19.75708 |
| F-statistic | 21.63065 | Durbin-Watson stat | | 1.300007 |
| Prob(F-statistic) | 0.000012 | | | |

Dependent Variable: WARREN+WARRENCIP

Method: Least Squares

Date: 08/08/13 Time: 12:11

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 4402.249 | 2312.581 | 1.903609 | 0.0777 |
| HDD | 1.007579 | 0.184095 | 5.473151 | 0.0001 |
| CDD | 4.476238 | 0.961886 | 4.653607 | 0.0004 |
| TPI05W(-1) | 14.83759 | 3.879770 | 3.824348 | 0.0019 |
| R-squared | 0.742228 | Mean dependent var | | 18833.28 |
| Adjusted R-squared | 0.686991 | S.D. dependent var | | 764.5691 |
| S.E. of regression | 427.7550 | Akaike info criterion | | 15.14811 |
| Sum squared resid | 2561641. | Schwarz criterion | | 15.34597 |
| Log likelihood | -132.3330 | Hannan-Quinn criter. | | 15.17539 |
| F-statistic | 13.43719 | Durbin-Watson stat | | 0.818789 |
| Prob(F-statistic) | 0.000209 | | | |

Dependent Variable: WARROAD+WARROADCIP

Method: Least Squares

Date: 08/08/13 Time: 12:03

Sample (adjusted): 1995 2012

Included observations: 18 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -21915.96 | 33932.72 | -0.645865 | 0.5305 |
| HDD | 0.548205 | 0.573095 | 0.956570 | 0.3577 |
| CDD | 5.136039 | 4.684459 | 1.096400 | 0.2944 |
| HHW | 11.39948 | 6.854472 | 1.663072 | 0.1222 |
| TPI05W(-1) | 27.70794 | 15.14748 | 1.829211 | 0.0923 |
| D12ON | -4396.934 | 1739.307 | -2.527980 | 0.0265 |
| R-squared | 0.760086 | Mean dependent var | | 55473.56 |
| Adjusted R-squared | 0.660122 | S.D. dependent var | | 2628.778 |
| S.E. of regression | 1532.554 | Akaike info criterion | | 17.76846 |
| Sum squared resid | 28184650 | Schwarz criterion | | 18.06525 |
| Log likelihood | -153.9161 | Hannan-Quinn criter. | | 17.80938 |
| F-statistic | 7.603579 | Durbin-Watson stat | | 0.762900 |
| Prob(F-statistic) | 0.001981 | | | |

APPENDIX C
FORM 7 DATABASE

APPENDIX D
MONTHLY PEAK DEMAND

APPENDIX E

COMPARISON WITH PREVIOUS FORECASTS

Appendix E **Comparison to Previous PRS Forecasts**

Appendix E presents Minnkota's 2013 Load Forecast results compared to the projections developed for the 2011, 2009, 2007, 2005, 2003, 2001, 1999, 1997 and 1995 forecasts. The 1995 forecast projected an average growth rate of 2.1 percent per year for total member system energy requirements while the 1997 forecast forecasted an average annual growth rate of 2.4 percent. The projected long-term growth rate in the 1999 and 2001 forecasts was 2.5 percent per year. The 2003 forecast projected member system energy requirements to grow at 2.3 percent per year through 2012. The 2005 forecast projects requirements to grow at 2.6 percent per year. Long-term growth rates peaked with the 2007 forecast, before falling off to 2.5 and then 1.9 percent per year with the 2011 forecast. Much of explanation for the drop-off in growth projected growth can be traced to the severe economic downturn, the worst since the Great Depression. The nearest forecast cycle to this would be the 1995 study, which projected 2.1 percent annual growth and followed the early 1990's recession.

Among all of the previous forecasts, the projected sales levels have maintained a remarkable level of consistency. This lends support to the idea of a long-term forecast trend that Minnkota sales seem to be experiencing. The 2013 forecast projects member system energy requirements to grow at 1.9 percent per year for 2013 through 2023.

There are numerous cooperative-specific factors that have contributed to the long-term outlook for members' sales. These factors are described in detail in each of the member systems' reports. However, the primary drivers of this expectation can be generalized to include the following factors:

- Increasing long-term wholesale rate forecasts from Minnkota.
- Dampened real per-capita income, employment, and population projections from Woods & Poole following the economic crisis.
- Expectations of slower growth and expansion of more urban areas into traditionally rural areas as the housing market continues to be slow.

As this forecast is monitored and updated in the future, Minnkota will benefit from paying close attention to the developments that affect these important input assumptions.

Comparison With Previous Forecast Results - Total Member System Energy Requirements [1]
 Minnkota Power Cooperative, Inc.
 (MWh)

| Year | 1995 PRS | 1997 PRS | 1999 PRS | 2001 Forecast | 2003 Forecast | 2005 Forecast | 2007 Forecast | 2009 Forecast | 2011 Forecast | 2013 Forecast |
|------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1990 | 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 | [2] 1,860,324 |
| 1991 | 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 | [2] 2,018,791 |
| 1992 | 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 | [2] 2,017,999 |
| 1993 | 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 | [2] 2,160,868 |
| 1994 | 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 | [2] 2,228,292 |
| 1995 | 2,284,228 | [3] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 | [2] 2,352,345 |
| 1996 | 2,336,274 | [3] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 | [2] 2,488,710 |
| 1997 | 2,404,069 | [3] 2,481,196 | [3] 2,456,133 | [2] 2,456,133 | [2] 2,456,133 | [2] 2,456,133 | [2] 2,456,133 | [2] 2,456,133 | [2] 2,456,133 | [2] 2,456,133 |
| 1998 | 2,456,116 | [3] 2,678,129 | [3] 2,347,968 | [2] 2,347,968 | [2] 2,347,968 | [2] 2,347,968 | [2] 2,347,968 | [2] 2,347,968 | [2] 2,347,968 | [2] 2,347,968 |
| 1999 | 2,500,447 | [3] 2,691,542 | [3] 2,492,504 | [3] 2,473,174 | [2] 2,473,174 | [2] 2,473,174 | [2] 2,473,174 | [2] 2,473,174 | [2] 2,473,174 | [2] 2,473,174 |
| 2000 | 2,522,659 | [3] 2,741,590 | [3] 2,550,020 | [3] 2,553,456 | [2] 2,553,456 | [2] 2,553,456 | [2] 2,553,456 | [2] 2,553,456 | [2] 2,553,456 | [2] 2,553,456 |
| 2001 | 2,576,011 | [3] 2,800,605 | [3] 2,620,172 | [3] 2,719,707 | [3] 2,692,024 | [2] 2,692,024 | [2] 2,692,024 | [2] 2,692,024 | [2] 2,692,024 | [2] 2,692,024 |
| 2002 | 2,637,983 | [3] 2,857,033 | [3] 2,678,977 | [3] 2,814,857 | [3] 2,865,734 | [2] 2,865,734 | [2] 2,865,734 | [2] 2,865,734 | [2] 2,865,734 | [2] 2,865,734 |
| 2003 | 2,684,275 | [3] 2,912,795 | [3] 2,741,503 | [3] 2,842,662 | [3] 2,923,230 | [3] 2,860,849 | [2] 2,860,849 | [2] 2,860,849 | [2] 2,860,849 | [2] 2,860,849 |
| 2004 | 2,744,549 | [3] 2,967,492 | [3] 2,806,651 | [3] 2,901,868 | [3] 2,980,973 | [3] 2,930,437 | [2] 2,930,437 | [2] 2,930,437 | [2] 2,930,437 | [2] 2,930,437 |
| 2005 | | [3] 3,021,109 | [3] 2,877,840 | [3] 2,981,372 | [3] 3,015,329 | [3] 3,081,977 | [3] 2,997,936 | [2] 2,997,936 | [2] 2,997,936 | [2] 2,997,936 |
| 2006 | | [3] 3,076,021 | [3] 2,950,995 | [3] 3,060,589 | [3] 3,088,801 | [3] 3,142,079 | [3] 3,080,882 | [2] 3,080,882 | [2] 3,080,882 | [2] 3,080,882 |
| 2007 | | | [3] 3,027,646 | [3] 3,137,355 | [3] 3,146,281 | [3] 3,244,956 | [3] 3,272,116 | [3] 3,269,300 | [2] 3,269,300 | [2] 3,269,300 |
| 2008 | | | [3] 3,106,103 | [3] 3,217,465 | [3] 3,236,635 | [3] 3,305,869 | [3] 3,382,192 | [3] 3,460,221 | [2] 3,460,221 | [2] 3,460,221 |
| 2009 | | | | [3] 3,297,268 | [3] 3,330,112 | [3] 3,393,782 | [3] 3,492,849 | [3] 3,417,485 | [3] 3,518,961 | [2] 3,518,961 |
| 2010 | | | | [3] 3,384,043 | [3] 3,414,350 | [3] 3,489,123 | [3] 3,799,110 | [3] 3,645,860 | [3] 3,425,669 | [2] 3,425,669 |
| 2011 | | | | | [3] 3,502,807 | [3] 3,581,108 | [3] 4,007,562 | [3] 3,809,597 | [3] 3,659,417 | [3] 3,602,110 |
| 2012 | | | | | [3] 3,599,109 | [3] 3,678,532 | [3] 4,081,638 | [3] 3,859,302 | [3] 3,705,183 | [3] 3,556,036 |
| 2013 | | | | | | [3] 3,776,986 | [3] 4,162,169 | [3] 3,927,747 | [3] 3,766,993 | [3] 3,680,996 |
| 2014 | | | | | | [3] 3,878,044 | [3] 4,236,106 | [3] 3,989,032 | [3] 3,849,531 | [3] 3,755,668 |
| 2015 | | | | | | | [3] 4,323,620 | [3] 4,055,013 | [3] 3,909,367 | [3] 3,828,298 |
| 2016 | | | | | | | [3] 4,399,861 | [3] 4,118,611 | [3] 3,976,014 | [3] 3,932,290 |
| 2017 | | | | | | | [3] 4,491,652 | [3] 4,197,790 | [3] 4,033,111 | [3] 3,996,395 |
| 2018 | | | | | | | [3] 4,570,844 | [3] 4,275,281 | [3] 4,098,980 | [3] 4,065,169 |
| 2019 | | | | | | | [3] 4,658,073 | [3] 4,354,700 | [3] 4,172,537 | [3] 4,131,135 |
| 2020 | | | | | | | [3] 4,748,679 | [3] 4,428,262 | [3] 4,252,809 | [3] 4,205,276 |
| 2021 | | | | | | | [3] 4,852,197 | [3] 4,508,939 | [3] 4,331,271 | [3] 4,279,406 |
| 2022 | | | | | | | [3] 4,956,505 | [3] 4,586,309 | [3] 4,407,937 | [3] 4,359,487 |
| 2023 | | | | | | | [3] 5,065,500 | [3] 4,668,547 | [3] 4,474,839 | [3] 4,439,837 |
| 2024 | | | | | | | [3] 5,168,607 | [3] 4,743,202 | [3] 4,534,303 | [3] 4,517,328 |
| 2025 | | | | | | | [3] 5,278,191 | [3] 4,820,684 | [3] 4,584,762 | [3] 4,585,147 |
| 2026 | | | | | | | [3] 5,380,937 | [3] 4,894,574 | [3] 4,633,270 | [3] 4,653,508 |
| 2027 | | | | | | | | [3] 4,977,125 | [3] 4,679,209 | [3] 4,704,787 |
| 2028 | | | | | | | | [3] 5,056,823 | [3] 4,727,781 | [3] 4,757,956 |
| 2029 | | | | | | | | [3] 5,138,507 | [3] 4,773,210 | [3] 4,814,863 |
| 2030 | | | | | | | | [3] 5,216,713 | [3] 4,821,261 | [3] 4,868,366 |
| 2031 | | | | | | | | [3] 5,300,004 | [3] 4,866,610 | [3] 4,915,760 |
| 2032 | | | | | | | | [3] 5,381,224 | [3] 4,913,159 | [3] 4,968,958 |
| 2033 | | | | | | | | [3] 5,466,524 | [3] 4,954,367 | [3] 5,025,761 |
| 2034 | | | | | | | | | [3] 5,003,296 | [3] 5,077,672 |
| 2035 | | | | | | | | | [3] 5,043,851 | [3] 5,124,343 |
| 2036 | | | | | | | | | [3] 5,088,272 | [3] 5,178,811 |
| 2037 | | | | | | | | | [3] 5,129,264 | [3] 5,231,152 |
| 2038 | | | | | | | | | [3] 5,173,538 | [3] 5,281,225 |
| 2039 | | | | | | | | | [3] 5,213,514 | [3] 5,327,939 |
| 2040 | | | | | | | | | [3] 5,257,180 | [3] 5,377,963 |
| 2041 | | | | | | | | | | [3] 5,423,807 |
| 2042 | | | | | | | | | | [3] 5,473,439 |

Average Annual Growth Rates

| | | | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|
| 1992-2012 | -100.0% | -100.0% | -100.0% | -100.0% | 2.9% | 3.0% | 3.6% | 3.3% | 3.1% | 2.9% |
| 2002-2012 | -100.0% | -100.0% | -100.0% | -100.0% | 2.3% | 2.5% | 3.6% | 3.0% | 2.6% | 2.2% |
| 2007-2012 | -- | -- | -100.0% | -100.0% | 2.7% | 2.5% | 4.5% | 3.4% | 2.5% | 1.7% |
| 2012-2017 | -- | -- | -- | -- | -100.0% | -100.0% | 1.9% | 1.7% | 1.7% | 2.4% |
| 2012-2022 | -- | -- | -- | -- | -100.0% | -100.0% | 2.0% | 1.7% | 1.8% | 2.1% |
| 2012-2032 | -- | -- | -- | -- | -100.0% | -100.0% | -100.0% | 1.7% | 1.4% | 1.7% |
| 2012-2042 | -- | -- | -- | -- | -100.0% | -100.0% | -100.0% | -100.0% | -100.0% | 1.4% |
| 10-Yr Forecast | 2.1% | 2.4% | 2.5% | 2.5% | 2.3% | 2.6% | 3.3% | 2.5% | 1.7% | 1.9% |

[1] Includes Member Own-Use and Losses. Excludes CAFS, NMPA and MPC Own-Use and Losses.
 [2] Historic
 [3] Projected

APPENDIX F
SUPPLEMENTAL TABLES

Own-Use/Loss Forecast By Member (MWh)
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | North | | Red | Red | Roseau | Wild | Total | |
|------|----------|--------|-------------|-------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | | | | | | Lake |
| 1983 | 12,294 | 12,889 | 2,356 | 4,134 | 31,930 | 6,250 | 5,692 | 7,217 | 8,511 | 5,771 | 14,183 | 111,228 |
| 1984 | 11,407 | 4,415 | 1,200 | 3,553 | 35,323 | 5,994 | 5,425 | 5,840 | 7,372 | 4,844 | 13,154 | 98,527 |
| 1985 | 13,728 | 14,298 | 2,716 | 4,424 | 24,222 | 7,181 | 7,285 | 7,272 | 7,413 | 7,740 | 18,972 | 115,249 |
| 1986 | 7,631 | 14,640 | 1,755 | 3,465 | 25,587 | 5,320 | 4,664 | 4,593 | 7,911 | 4,076 | 15,042 | 94,685 |
| 1987 | 8,276 | 16,676 | 1,754 | 4,400 | 26,083 | 6,221 | 4,743 | 6,176 | 8,367 | 5,884 | 12,410 | 100,990 |
| 1988 | 13,020 | 13,944 | 2,100 | 4,899 | 23,060 | 6,683 | 4,672 | 6,836 | 7,944 | 7,323 | 19,149 | 109,631 |
| 1989 | 17,472 | 22,100 | 2,362 | 5,589 | 32,107 | 7,488 | 8,324 | 9,464 | 8,283 | 10,149 | 21,318 | 144,658 |
| 1990 | 9,467 | 10,218 | 1,555 | 2,656 | 15,303 | 6,104 | 3,586 | 4,298 | 5,020 | 4,060 | 14,585 | 76,851 |
| 1991 | 14,822 | 19,246 | 2,391 | 5,327 | 28,551 | 7,610 | 6,389 | 7,691 | 7,992 | 9,224 | 20,315 | 129,557 |
| 1992 | 13,421 | 15,851 | 2,101 | 4,393 | 23,446 | 5,930 | 6,758 | 6,016 | 6,765 | 6,675 | 11,103 | 102,460 |
| 1993 | 13,609 | 17,082 | 2,645 | 5,737 | 30,809 | 7,228 | 4,921 | 6,976 | 9,119 | 6,691 | 13,416 | 118,233 |
| 1994 | 16,693 | 20,171 | 2,999 | 5,313 | 28,453 | 7,359 | 7,744 | 7,677 | 8,513 | 8,284 | 16,458 | 129,664 |
| 1995 | 19,448 | 18,241 | 3,470 | 5,804 | 28,074 | 6,582 | 6,958 | 9,333 | 9,565 | 9,804 | 16,768 | 134,049 |
| 1996 | 17,200 | 10,755 | 3,289 | 4,588 | 24,925 | 6,228 | 6,586 | 7,261 | 4,936 | 7,261 | 13,455 | 106,483 |
| 1997 | 14,737 | 30,660 | 2,201 | 3,906 | 32,350 | 8,015 | 4,267 | 6,586 | 3,042 | 3,886 | 17,888 | 127,537 |
| 1998 | 15,209 | 13,274 | 2,860 | 4,470 | 26,938 | 5,247 | 6,119 | 7,229 | 2,505 | 7,667 | 12,606 | 104,123 |
| 1999 | 17,909 | 20,214 | 2,674 | 3,318 | 24,454 | 7,504 | 6,014 | 7,959 | 5,951 | (950) | 17,157 | 112,205 |
| 2000 | 16,781 | 18,786 | 3,599 | 5,481 | 18,518 | 7,160 | 6,101 | 9,798 | 8,233 | 6,802 | 16,179 | 117,440 |
| 2001 | 17,208 | 26,704 | 198 | 4,857 | 32,383 | 7,550 | 2,472 | (311) | 6,721 | 8,857 | 15,455 | 122,094 |
| 2002 | 18,851 | 23,854 | 3,128 | 6,084 | 32,713 | 9,885 | 9,047 | 8,008 | 8,354 | 7,827 | 20,581 | 148,332 |
| 2003 | 21,260 | 20,864 | 3,290 | 6,273 | 27,834 | 9,024 | 6,464 | 8,062 | 7,664 | 7,785 | 19,288 | 137,808 |
| 2004 | 23,066 | 30,922 | 3,647 | 5,642 | 28,005 | 11,003 | 9,118 | 8,195 | 7,482 | 8,418 | 11,398 | 146,896 |
| 2005 | 24,047 | 31,054 | 3,067 | 6,333 | 34,849 | 9,489 | 8,386 | 7,906 | 7,730 | 7,837 | 17,996 | 158,695 |
| 2006 | 24,771 | 29,941 | 2,847 | 5,713 | 27,140 | 8,472 | 6,201 | 7,184 | 7,234 | 7,614 | 20,685 | 147,802 |
| 2007 | 27,297 | 31,261 | 3,685 | 6,819 | 28,100 | 11,617 | 5,118 | 7,912 | 9,157 | 9,214 | 20,092 | 160,272 |
| 2008 | 28,541 | 35,456 | 3,733 | 7,149 | 33,838 | 8,986 | 16,002 | 10,875 | 10,635 | 8,963 | 22,966 | 187,144 |
| 2009 | 26,078 | 34,390 | 3,778 | 5,909 | 35,189 | 8,170 | 10,521 | 8,077 | 8,183 | 7,061 | 24,934 | 172,290 |
| 2010 | 24,091 | 39,786 | 3,646 | 6,656 | 30,641 | 7,850 | 2,419 | 8,239 | 3,770 | 7,482 | 23,387 | 157,969 |
| 2011 | 24,796 | 28,136 | 3,063 | 4,763 | 30,160 | 7,831 | 7,184 | 6,822 | 9,378 | 8,590 | 22,907 | 153,630 |
| 2012 | 22,714 | 34,925 | 3,382 | 5,480 | 29,707 | 7,804 | 6,038 | 7,529 | 8,736 | 4,914 | 19,516 | 150,745 |
| 2013 | 22,564 | 37,873 | 3,409 | 5,570 | 29,071 | 7,959 | 8,933 | 8,126 | 7,442 | 7,475 | 20,320 | 158,743 |
| 2014 | 22,678 | 39,108 | 3,727 | 5,635 | 29,851 | 8,225 | 8,894 | 8,188 | 7,341 | 7,451 | 20,431 | 161,530 |
| 2015 | 22,921 | 40,787 | 3,880 | 5,674 | 30,221 | 8,468 | 8,931 | 8,403 | 6,950 | 7,465 | 20,559 | 164,258 |
| 2016 | 23,117 | 43,068 | 3,891 | 5,649 | 30,855 | 8,874 | 8,965 | 8,515 | 7,001 | 7,486 | 20,630 | 168,050 |
| 2017 | 23,440 | 44,395 | 3,936 | 5,686 | 31,064 | 9,093 | 9,004 | 8,644 | 7,075 | 7,540 | 20,769 | 170,646 |
| 2018 | 23,762 | 45,757 | 3,970 | 5,786 | 31,296 | 9,217 | 9,047 | 8,760 | 7,226 | 7,595 | 21,090 | 173,506 |
| 2019 | 24,067 | 46,866 | 3,985 | 5,818 | 31,818 | 9,330 | 9,097 | 8,806 | 7,292 | 7,650 | 21,271 | 176,000 |
| 2020 | 24,486 | 48,369 | 4,008 | 5,826 | 32,219 | 9,454 | 9,142 | 8,846 | 7,342 | 7,703 | 21,401 | 178,796 |
| 2021 | 24,906 | 49,866 | 4,065 | 5,907 | 32,464 | 9,598 | 9,194 | 8,930 | 7,445 | 7,777 | 21,681 | 181,833 |
| 2022 | 25,338 | 51,322 | 4,119 | 6,060 | 32,727 | 9,720 | 9,245 | 9,164 | 7,636 | 7,847 | 22,098 | 185,275 |
| 2023 | 25,813 | 52,804 | 4,164 | 6,112 | 33,170 | 9,840 | 9,301 | 9,215 | 7,773 | 7,908 | 22,334 | 188,434 |
| 2024 | 26,257 | 54,395 | 4,206 | 6,204 | 33,432 | 9,958 | 9,352 | 9,301 | 7,874 | 7,967 | 22,635 | 191,581 |
| 2025 | 26,667 | 55,701 | 4,237 | 6,276 | 33,697 | 10,069 | 9,409 | 9,389 | 7,977 | 8,026 | 22,903 | 194,351 |
| 2026 | 27,002 | 56,963 | 4,251 | 6,328 | 34,088 | 10,168 | 9,467 | 9,478 | 8,103 | 8,066 | 23,123 | 197,038 |
| 2027 | 27,276 | 58,060 | 4,256 | 6,331 | 34,293 | 10,262 | 9,523 | 9,542 | 8,135 | 8,098 | 23,250 | 199,027 |
| 2028 | 27,516 | 59,256 | 4,267 | 6,333 | 34,504 | 10,355 | 9,583 | 9,588 | 8,146 | 8,133 | 23,371 | 201,054 |
| 2029 | 27,749 | 60,390 | 4,271 | 6,337 | 34,878 | 10,448 | 9,645 | 9,635 | 8,156 | 8,160 | 23,492 | 203,161 |
| 2030 | 28,012 | 61,562 | 4,272 | 6,337 | 35,084 | 10,541 | 9,702 | 9,681 | 8,228 | 8,194 | 23,610 | 205,224 |
| 2031 | 28,238 | 62,569 | 4,274 | 6,336 | 35,307 | 10,634 | 9,764 | 9,728 | 8,238 | 8,219 | 23,729 | 207,036 |
| 2032 | 28,474 | 63,703 | 4,276 | 6,336 | 35,522 | 10,725 | 9,822 | 9,902 | 8,247 | 8,249 | 23,847 | 209,104 |
| 2033 | 28,737 | 64,783 | 4,278 | 6,338 | 35,925 | 10,818 | 9,885 | 9,948 | 8,256 | 8,273 | 23,965 | 211,207 |
| 2034 | 28,962 | 65,887 | 4,280 | 6,337 | 36,160 | 10,912 | 9,950 | 9,995 | 8,329 | 8,303 | 24,086 | 213,200 |
| 2035 | 29,195 | 66,833 | 4,291 | 6,335 | 36,407 | 11,007 | 10,010 | 10,042 | 8,338 | 8,324 | 24,206 | 214,989 |
| 2036 | 29,465 | 68,014 | 4,292 | 6,335 | 36,655 | 11,103 | 10,072 | 10,088 | 8,348 | 8,353 | 24,328 | 217,055 |
| 2037 | 29,695 | 68,928 | 4,293 | 6,337 | 37,083 | 11,201 | 10,139 | 10,135 | 8,357 | 8,375 | 24,450 | 218,993 |
| 2038 | 29,930 | 69,970 | 4,297 | 6,338 | 37,339 | 11,302 | 10,197 | 10,181 | 8,367 | 8,404 | 24,573 | 220,898 |
| 2039 | 30,221 | 70,857 | 4,299 | 6,339 | 37,595 | 11,404 | 10,267 | 10,227 | 8,377 | 8,428 | 24,696 | 222,711 |
| 2040 | 30,465 | 71,873 | 4,302 | 6,342 | 37,867 | 11,513 | 10,324 | 10,273 | 8,387 | 8,451 | 24,820 | 224,617 |
| 2041 | 30,711 | 72,733 | 4,316 | 6,346 | 38,143 | 11,623 | 10,384 | 10,318 | 8,396 | 8,474 | 24,943 | 226,387 |
| 2042 | 30,960 | 73,722 | 4,320 | 6,348 | 38,423 | 11,735 | 10,441 | 10,363 | 8,406 | 8,497 | 25,065 | 228,279 |

Average Annual Growth Rates

| | | | | | | | | | | | | |
|-----------|-------|------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| 1983-2012 | 2.1% | 3.5% | 1.3% | 1.0% | -0.2% | 0.8% | 0.2% | 0.1% | 0.1% | -0.6% | 1.1% | 1.1% |
| 1997-2012 | 2.9% | 0.9% | 2.9% | 2.3% | -0.6% | -0.2% | 2.3% | 0.9% | 7.3% | 1.6% | 0.6% | 1.1% |
| 2002-2012 | 1.9% | 3.9% | 0.8% | -1.0% | -1.0% | -2.3% | -4.0% | -0.6% | 0.4% | -4.5% | -0.5% | 0.2% |
| 2007-2012 | -3.6% | 2.2% | -1.7% | -4.3% | 1.1% | -7.6% | 3.4% | -1.0% | -0.9% | -11.8% | -0.6% | -1.2% |
| 2012-2017 | 0.6% | 4.9% | 3.1% | 0.7% | 0.9% | 3.1% | 8.3% | 2.8% | -4.1% | 8.9% | 1.3% | 2.5% |
| 2012-2022 | 1.1% | 3.9% | 2.0% | 1.0% | 1.0% | 2.2% | 4.4% | 2.0% | -1.3% | 4.8% | 1.3% | 2.1% |
| 2012-2032 | 1.1% | 3.1% | 1.2% | 0.7% | 0.9% | 1.6% | 2.5% | 1.4% | -0.3% | 2.6% | 1.0% | 1.6% |
| 2012-2042 | 1.0% | 2.5% | 0.8% | 0.5% | 0.9% | 1.4% | 1.8% | 1.1% | -0.1% | 1.8% | 0.8% | 1.4% |
| 2013-2042 | 1.1% | 2.3% | 0.8% | 0.5% | 1.0% | 1.3% | 0.5% | 0.8% | 0.4% | 0.4% | 0.7% | 1.3% |

Retail Energy Forecasts By Class (MWh) - MN
Minnkota Power Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>Small Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Resale RUS</u> | <u>Resale Other</u> | <u>Total Member Sales</u> | <u>MWh From 2011 PRS</u> |
|------------------------------------|--------------------|-----------------|-------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------|---------------------|---------------------------|--------------------------|
| 1992 | 722,987 | 11,184 | 1,771 | 114,040 | 21,248 | 1,143 | - | 5,378 | 88,953 | 966,705 | |
| 1993 | 765,013 | 11,934 | 1,301 | 122,748 | 26,439 | 1,258 | - | 5,651 | 91,500 | 1,025,844 | |
| 1994 | 768,835 | 11,490 | 1,317 | 127,026 | 33,341 | 1,206 | - | 5,684 | 98,355 | 1,047,255 | |
| 1995 | 801,943 | 12,285 | 1,340 | 137,466 | 38,352 | 1,195 | - | 5,792 | 98,465 | 1,096,837 | |
| 1996 | 875,059 | 13,769 | 1,531 | 137,290 | 43,979 | 1,208 | - | 6,281 | 109,476 | 1,188,592 | |
| 1997 | 865,998 | 13,313 | 1,584 | 139,332 | 46,408 | 1,217 | - | 6,526 | 109,758 | 1,184,135 | |
| 1998 | 798,011 | 12,385 | 1,913 | 139,682 | 49,677 | 1,277 | - | 6,197 | 117,152 | 1,126,294 | |
| 1999 | 843,880 | 13,341 | 1,671 | 146,814 | 63,839 | 1,341 | - | 6,515 | 113,927 | 1,191,329 | |
| 2000 | 865,735 | 13,545 | 2,185 | 147,853 | 72,181 | 1,268 | - | 6,672 | 101,272 | 1,210,712 | |
| 2001 | 915,782 | 14,055 | 1,801 | 149,586 | 74,271 | 1,376 | - | 6,775 | 99,534 | 1,263,181 | |
| 2002 | 961,894 | 14,615 | 1,472 | 155,968 | 78,541 | 1,416 | - | 7,157 | 103,977 | 1,325,040 | |
| 2003 | 953,498 | 14,504 | 1,957 | 160,471 | 80,366 | 1,403 | - | 7,279 | 96,263 | 1,315,741 | |
| 2004 | 972,596 | 14,277 | 2,053 | 163,990 | 83,958 | 1,338 | - | 7,802 | 99,773 | 1,345,788 | |
| 2005 | 976,147 | 13,619 | 1,608 | 165,609 | 87,631 | 1,282 | - | 7,696 | 98,552 | 1,352,143 | |
| 2006 | 977,331 | 10,558 | 1,626 | 162,960 | 85,382 | 1,355 | - | 7,618 | 105,224 | 1,352,054 | |
| 2007 | 1,021,008 | 10,027 | 2,194 | 171,984 | 92,320 | 1,388 | - | 8,012 | 96,796 | 1,403,729 | |
| 2008 | 1,076,673 | 10,072 | 2,048 | 178,274 | 98,780 | 1,437 | - | 7,990 | 93,532 | 1,468,805 | |
| 2009 | 1,106,864 | 8,784 | 1,605 | 189,224 | 93,327 | 1,421 | - | 8,119 | 80,975 | 1,490,320 | |
| 2010 | 1,032,259 | 8,010 | 2,136 | 191,213 | 98,685 | 1,423 | - | 7,860 | 84,359 | 1,425,946 | |
| 2011 | 1,034,957 | 8,138 | 1,664 | 180,872 | 106,966 | 1,413 | - | 7,931 | 75,683 | 1,417,625 | 1,478,445 |
| 2012 | 965,369 | 8,056 | 2,331 | 176,083 | 117,624 | 1,387 | - | 7,069 | 79,838 | 1,357,755 | 1,512,169 |
| 2013 | 993,004 | 8,156 | 2,008 | 183,438 | 124,438 | 1,408 | - | 7,069 | 73,204 | 1,392,725 | 1,537,802 |
| 2014 | 994,745 | 8,196 | 2,008 | 184,660 | 126,902 | 1,415 | - | 7,069 | 74,001 | 1,398,997 | 1,562,271 |
| 2015 | 994,683 | 8,236 | 2,035 | 186,862 | 130,372 | 1,423 | - | 7,069 | 76,300 | 1,406,979 | 1,582,374 |
| 2016 | 999,601 | 8,276 | 2,035 | 189,053 | 135,847 | 1,430 | - | 7,069 | 77,101 | 1,420,411 | 1,594,771 |
| 2017 | 1,011,092 | 8,315 | 2,063 | 191,508 | 137,326 | 1,438 | - | 7,069 | 77,903 | 1,436,713 | 1,616,624 |
| 2018 | 1,025,017 | 8,355 | 2,086 | 194,212 | 138,811 | 1,445 | - | 7,069 | 78,708 | 1,455,702 | 1,641,312 |
| 2019 | 1,035,591 | 8,395 | 2,137 | 196,896 | 139,301 | 1,452 | - | 7,069 | 78,514 | 1,469,355 | 1,666,665 |
| 2020 | 1,045,216 | 8,435 | 2,160 | 199,486 | 141,797 | 1,459 | - | 7,069 | 78,322 | 1,483,944 | 1,697,427 |
| 2021 | 1,061,608 | 8,476 | 2,211 | 202,383 | 142,298 | 1,466 | - | 7,069 | 78,131 | 1,503,640 | 1,729,961 |
| 2022 | 1,081,034 | 8,516 | 2,234 | 205,349 | 145,804 | 1,473 | - | 7,069 | 77,942 | 1,529,421 | 1,765,220 |
| 2023 | 1,097,030 | 8,556 | 2,261 | 208,280 | 146,316 | 1,480 | - | 7,069 | 77,755 | 1,548,747 | 1,799,375 |
| 2024 | 1,113,574 | 8,597 | 2,261 | 211,164 | 146,833 | 1,487 | - | 7,069 | 77,570 | 1,568,554 | 1,828,068 |
| 2025 | 1,128,964 | 8,637 | 2,289 | 213,964 | 147,356 | 1,493 | - | 7,069 | 77,386 | 1,587,159 | 1,855,143 |
| 2026 | 1,141,031 | 8,677 | 2,289 | 216,654 | 148,885 | 1,500 | - | 7,069 | 77,205 | 1,603,310 | 1,879,859 |
| 2027 | 1,149,174 | 8,718 | 2,316 | 219,178 | 149,420 | 1,506 | - | 7,069 | 77,024 | 1,614,405 | 1,906,725 |
| 2028 | 1,156,137 | 8,759 | 2,316 | 221,687 | 149,961 | 1,512 | - | 7,069 | 76,846 | 1,624,285 | 1,932,690 |
| 2029 | 1,162,702 | 8,799 | 2,343 | 224,260 | 150,507 | 1,519 | - | 7,069 | 76,669 | 1,633,869 | 1,960,680 |
| 2030 | 1,169,950 | 8,840 | 2,343 | 226,747 | 152,060 | 1,525 | - | 7,069 | 76,494 | 1,645,027 | 1,990,454 |
| 2031 | 1,176,293 | 8,881 | 2,370 | 229,268 | 152,619 | 1,531 | - | 7,069 | 76,321 | 1,654,351 | 2,015,111 |
| 2032 | 1,182,845 | 8,922 | 2,370 | 231,823 | 155,184 | 1,537 | - | 7,069 | 76,149 | 1,665,898 | 2,044,420 |
| 2033 | 1,189,795 | 8,963 | 2,398 | 234,423 | 155,755 | 1,543 | - | 7,069 | 75,979 | 1,675,924 | 2,072,913 |
| 2034 | 1,196,248 | 9,004 | 2,398 | 237,011 | 157,333 | 1,548 | - | 7,069 | 75,811 | 1,686,421 | 2,100,954 |
| 2035 | 1,202,493 | 9,045 | 2,425 | 239,661 | 157,917 | 1,554 | - | 7,069 | 75,644 | 1,695,807 | 2,130,176 |
| 2036 | 1,209,717 | 9,086 | 2,425 | 242,302 | 158,507 | 1,560 | - | 7,069 | 75,479 | 1,706,145 | 2,158,333 |
| 2037 | 1,215,988 | 9,127 | 2,452 | 245,074 | 159,105 | 1,565 | - | 7,069 | 75,316 | 1,715,696 | 2,187,219 |
| 2038 | 1,222,451 | 9,169 | 2,452 | 247,813 | 159,709 | 1,571 | - | 7,069 | 75,154 | 1,725,387 | 2,216,271 |
| 2039 | 1,229,953 | 9,210 | 2,479 | 250,659 | 160,320 | 1,576 | - | 7,069 | 74,994 | 1,736,260 | 2,246,489 |
| 2040 | 1,236,484 | 9,251 | 2,479 | 253,480 | 160,938 | 1,581 | - | 7,069 | 74,836 | 1,746,118 | 2,275,522 |
| 2041 | 1,243,011 | 9,293 | 2,507 | 256,372 | 161,562 | 1,587 | - | 7,069 | 74,679 | 1,756,078 | |
| 2042 | 1,249,536 | 9,334 | 2,507 | 259,269 | 162,194 | 1,592 | - | 7,069 | 74,524 | 1,766,024 | |
| Average Annual Growth Rates | | | | | | | | | | | |
| 1992-2012 | 1.5% | -1.6% | 1.4% | 2.2% | 8.9% | 1.0% | -- | 1.4% | -0.5% | 1.7% | -- |
| 1997-2012 | 0.7% | -3.3% | 2.6% | 1.6% | 6.4% | 0.9% | -- | 0.5% | -2.1% | 0.9% | -- |
| 2002-2012 | 0.0% | -5.8% | 4.7% | 1.2% | 4.1% | -0.2% | -- | -0.1% | -2.6% | 0.2% | -- |
| 2007-2012 | -1.1% | -4.3% | 1.2% | 0.5% | 5.0% | 0.0% | -- | -2.5% | -3.8% | -0.7% | -- |
| 2012-2017 | 0.9% | 0.6% | -2.4% | 1.7% | 3.1% | 0.7% | -- | 0.0% | -0.5% | 1.1% | 1.3% |
| 2012-2022 | 1.1% | 0.6% | -0.4% | 1.5% | 2.2% | 0.6% | -- | 0.0% | -0.2% | 1.2% | 1.6% |
| 2012-2032 | 1.0% | 0.5% | 0.1% | 1.4% | 1.4% | 0.5% | -- | 0.0% | -0.2% | 1.0% | 1.5% |
| 2012-2042 | 0.9% | 0.5% | 0.2% | 1.3% | 1.1% | 0.5% | -- | 0.0% | -0.2% | 0.9% | |
| 2013-2042 | 0.8% | 0.5% | 0.8% | 1.2% | 0.9% | 0.4% | -- | 0.0% | 0.1% | 0.8% | |

Retail Energy Forecasts By Class (MWh) - ND
Minnkota Power Cooperative, Inc.

| Year | Residential | Seasonal | Irrigation | Small | | Street | Public | Resale | Resale | Total Member Sales | MWh From 2011 PRS |
|------|-------------|----------|------------|------------|------------|----------|-----------|--------|--------|--------------------|-------------------|
| | | | | Commercial | Commercial | Lighting | Authority | RUS | Other | | |
| 1992 | 520,743 | 786 | 7,475 | 202,019 | 91,344 | 1,762 | 121,864 | - | 2,840 | 948,834 | |
| 1993 | 568,104 | 831 | 3,646 | 217,120 | 100,673 | 1,902 | 121,565 | - | 2,949 | 1,016,792 | |
| 1994 | 573,801 | 727 | 7,740 | 230,088 | 113,744 | 2,125 | 120,015 | - | 3,132 | 1,051,372 | |
| 1995 | 606,502 | 676 | 8,540 | 262,604 | 116,774 | 2,329 | 120,798 | - | 3,237 | 1,121,459 | |
| 1996 | 658,756 | 714 | 9,549 | 257,738 | 138,563 | 2,468 | 122,293 | - | 3,552 | 1,193,634 | |
| 1997 | 623,899 | 703 | 7,787 | 259,433 | 139,378 | 2,604 | 107,107 | - | 3,549 | 1,144,460 | |
| 1998 | 583,026 | 828 | 10,497 | 263,545 | 161,258 | 2,733 | 92,781 | - | 2,881 | 1,117,550 | |
| 1999 | 607,608 | 964 | 8,274 | 281,976 | 177,747 | 3,042 | 86,970 | - | 3,059 | 1,169,640 | |
| 2000 | 697,854 | 997 | 7,837 | 231,351 | 210,649 | 3,356 | 70,312 | - | 2,948 | 1,225,304 | |
| 2001 | 707,798 | - | 6,761 | 248,868 | 269,833 | 3,666 | 67,092 | - | 2,731 | 1,306,749 | |
| 2002 | 752,278 | 685 | 8,304 | 259,362 | 295,464 | 4,633 | 68,285 | - | 3,351 | 1,392,362 | |
| 2003 | 755,342 | - | 11,241 | 267,242 | 299,372 | 4,105 | 66,876 | - | 3,122 | 1,407,300 | |
| 2004 | 771,952 | - | 9,175 | 268,003 | 314,193 | 4,613 | 66,184 | - | 3,632 | 1,437,753 | |
| 2005 | 801,084 | - | 6,809 | 276,204 | 331,875 | 5,186 | 64,102 | - | 1,838 | 1,487,098 | |
| 2006 | 810,929 | - | 15,791 | 278,089 | 402,772 | 5,459 | 64,479 | - | 3,507 | 1,581,026 | |
| 2007 | 861,146 | - | 9,859 | 289,084 | 429,791 | 5,834 | 106,080 | - | 3,505 | 1,705,299 | |
| 2008 | 926,566 | - | 11,547 | 304,813 | 445,531 | 6,151 | 105,857 | - | 3,807 | 1,804,272 | |
| 2009 | 973,126 | - | 10,067 | 314,187 | 444,438 | 6,645 | 103,905 | - | 3,985 | 1,856,352 | |
| 2010 | 916,208 | - | 7,922 | 311,955 | 495,911 | 7,261 | 99,078 | - | 3,418 | 1,841,753 | |
| 2011 | 934,453 | - | 5,417 | 300,154 | 689,063 | 7,834 | 90,651 | - | 3,284 | 2,030,855 | 2,024,809 |
| 2012 | 867,481 | - | 15,070 | 300,509 | 759,190 | 8,171 | 93,782 | - | 3,333 | 2,047,536 | 2,052,932 |
| 2013 | 946,813 | - | 13,065 | 326,294 | 766,815 | 8,312 | 93,322 | - | 3,345 | 2,157,964 | 2,086,531 |
| 2014 | 961,565 | - | 13,171 | 332,907 | 813,444 | 8,456 | 92,865 | - | 3,345 | 2,225,753 | 2,127,320 |
| 2015 | 976,087 | - | 13,277 | 342,392 | 832,369 | 8,599 | 92,410 | - | 3,345 | 2,268,479 | 2,154,820 |
| 2016 | 992,737 | - | 13,383 | 353,652 | 864,010 | 8,741 | 91,957 | - | 3,345 | 2,327,825 | 2,189,923 |
| 2017 | 1,011,411 | - | 13,490 | 365,068 | 885,376 | 8,900 | 91,507 | - | 3,345 | 2,379,097 | 2,224,349 |
| 2018 | 1,032,383 | - | 13,596 | 376,617 | 910,674 | 9,060 | 91,059 | - | 3,345 | 2,436,733 | 2,261,422 |
| 2019 | 1,049,354 | - | 13,702 | 388,017 | 926,905 | 9,218 | 90,614 | - | 3,345 | 2,481,155 | 2,294,281 |
| 2020 | 1,070,194 | - | 13,808 | 399,743 | 943,069 | 9,375 | 90,170 | - | 3,345 | 2,529,703 | 2,334,112 |
| 2021 | 1,089,908 | - | 13,915 | 412,820 | 949,164 | 9,532 | 89,729 | - | 3,345 | 2,568,413 | 2,374,610 |
| 2022 | 1,109,482 | - | 14,021 | 426,830 | 959,192 | 9,705 | 89,290 | - | 3,345 | 2,611,865 | 2,415,015 |
| 2023 | 1,129,187 | - | 14,127 | 441,321 | 971,152 | 9,877 | 88,854 | - | 3,345 | 2,657,862 | 2,454,989 |
| 2024 | 1,147,921 | - | 14,233 | 455,031 | 981,043 | 10,049 | 88,419 | - | 3,345 | 2,700,041 | 2,495,072 |
| 2025 | 1,165,954 | - | 14,339 | 468,792 | 986,866 | 10,219 | 87,987 | - | 3,345 | 2,737,503 | 2,532,826 |
| 2026 | 1,181,367 | - | 14,446 | 481,483 | 1,002,620 | 10,389 | 87,557 | - | 3,345 | 2,781,206 | 2,569,224 |
| 2027 | 1,195,890 | - | 14,552 | 493,538 | 1,008,305 | 10,576 | 87,129 | - | 3,345 | 2,813,335 | 2,599,767 |
| 2028 | 1,210,199 | - | 14,658 | 505,330 | 1,017,921 | 10,762 | 86,704 | - | 3,345 | 2,848,918 | 2,636,652 |
| 2029 | 1,223,843 | - | 14,764 | 517,382 | 1,029,467 | 10,946 | 86,280 | - | 3,345 | 2,886,029 | 2,672,851 |
| 2030 | 1,237,071 | - | 14,871 | 529,457 | 1,038,944 | 11,130 | 85,859 | - | 3,345 | 2,920,677 | 2,710,241 |
| 2031 | 1,250,484 | - | 14,977 | 541,554 | 1,044,351 | 11,330 | 85,440 | - | 3,345 | 2,951,481 | 2,743,882 |
| 2032 | 1,263,244 | - | 15,083 | 553,668 | 1,053,688 | 11,529 | 85,023 | - | 3,345 | 2,985,580 | 2,781,547 |
| 2033 | 1,276,174 | - | 15,189 | 565,819 | 1,064,955 | 11,727 | 84,609 | - | 3,345 | 3,021,818 | 2,815,639 |
| 2034 | 1,288,755 | - | 15,295 | 578,004 | 1,074,151 | 11,924 | 84,196 | - | 3,345 | 3,055,670 | 2,854,032 |
| 2035 | 1,301,345 | - | 15,402 | 590,311 | 1,079,277 | 12,137 | 83,785 | - | 3,345 | 3,085,601 | 2,891,731 |
| 2036 | 1,313,529 | - | 15,508 | 602,556 | 1,088,332 | 12,349 | 83,377 | - | 3,345 | 3,118,997 | 2,930,586 |
| 2037 | 1,325,744 | - | 15,614 | 614,820 | 1,099,316 | 12,560 | 82,971 | - | 3,345 | 3,154,370 | 2,966,172 |
| 2038 | 1,337,618 | - | 15,720 | 627,124 | 1,108,229 | 12,788 | 82,566 | - | 3,345 | 3,187,390 | 3,006,202 |
| 2039 | 1,349,103 | - | 15,827 | 639,464 | 1,113,070 | 13,014 | 82,164 | - | 3,345 | 3,215,986 | 3,042,141 |
| 2040 | 1,360,887 | - | 15,933 | 651,833 | 1,121,840 | 13,238 | 81,764 | - | 3,345 | 3,248,840 | 3,085,493 |
| 2041 | 1,372,481 | - | 16,039 | 664,329 | 1,126,538 | 13,462 | 81,366 | - | 3,345 | 3,277,559 | |
| 2042 | 1,383,886 | - | 16,145 | 676,762 | 1,135,163 | 13,701 | 80,970 | - | 3,345 | 3,309,972 | |

Average Annual Growth Rates

| | | | | | | | | | | | |
|-----------|------|---------|-------|------|-------|------|-------|----|-------|------|------|
| 1992-2012 | 2.6% | -100.0% | 3.6% | 2.0% | 11.2% | 8.0% | -1.3% | -- | 0.8% | 3.9% | -- |
| 1997-2012 | 2.2% | -100.0% | 4.5% | 1.0% | 12.0% | 7.9% | -0.9% | -- | -0.4% | 4.0% | -- |
| 2002-2012 | 1.4% | -100.0% | 6.1% | 1.5% | 9.9% | 5.8% | 3.2% | -- | -0.1% | 3.9% | -- |
| 2007-2012 | 0.1% | -- | 8.9% | 0.8% | 12.1% | 7.0% | -2.4% | -- | -1.0% | 3.7% | -- |
| 2012-2017 | 3.1% | -- | -2.2% | 4.0% | 3.1% | 1.7% | -0.5% | -- | 0.1% | 3.0% | 1.6% |
| 2012-2022 | 2.5% | -- | -0.7% | 3.6% | 2.4% | 1.7% | -0.5% | -- | 0.0% | 2.5% | 1.6% |
| 2012-2032 | 1.9% | -- | 0.0% | 3.1% | 1.7% | 1.7% | -0.5% | -- | 0.0% | 1.9% | 1.5% |
| 2012-2042 | 1.6% | -- | 0.2% | 2.7% | 1.3% | 1.7% | -0.5% | -- | 0.0% | 1.6% | |
| 2013-2042 | 1.3% | -- | 0.7% | 2.5% | 1.4% | 1.7% | -0.5% | -- | 0.0% | 1.5% | |

Member Forecasts By Class-MN

| Year | | | | General | Large | Street | Public | Resale | Resale | Total |
|-----------------------------|-------------|----------|------------|------------|------------|----------|-----------|--------|--------|--------|
| | Residential | Seasonal | Irrigation | Commercial | Commercial | Lighting | Authority | RUS | Other | |
| 1983 | 38,410 | 4,537 | 53 | 2,211 | 12 | 81 | - | 1 | 5 | 45,311 |
| 1984 | 38,676 | 4,659 | 66 | 2,214 | 12 | 81 | - | 1 | 5 | 45,712 |
| 1985 | 38,786 | 4,712 | 67 | 2,209 | 12 | 80 | - | 1 | 5 | 45,872 |
| 1986 | 39,093 | 4,784 | 66 | 2,224 | 12 | 80 | - | 1 | 6 | 46,265 |
| 1987 | 39,536 | 4,911 | 62 | 2,296 | 12 | 81 | - | 1 | 7 | 46,905 |
| 1988 | 40,124 | 5,013 | 58 | 2,321 | 11 | 82 | - | 1 | 7 | 47,617 |
| 1989 | 40,620 | 5,032 | 52 | 2,380 | 11 | 82 | - | 1 | 7 | 48,184 |
| 1990 | 41,131 | 5,049 | 63 | 2,429 | 11 | 86 | - | 1 | 7 | 48,777 |
| 1991 | 41,631 | 5,134 | 82 | 2,491 | 11 | 91 | - | 1 | 8 | 49,447 |
| 1992 | 42,166 | 5,238 | 96 | 2,568 | 13 | 91 | - | 1 | 8 | 50,182 |
| 1993 | 42,859 | 5,307 | 108 | 2,654 | 15 | 92 | - | 1 | 9 | 51,045 |
| 1994 | 43,395 | 5,399 | 106 | 2,728 | 16 | 89 | - | 1 | 9 | 51,743 |
| 1995 | 44,199 | 5,412 | 101 | 2,802 | 21 | 91 | - | 1 | 9 | 52,637 |
| 1996 | 45,065 | 5,326 | 104 | 2,868 | 22 | 94 | - | 1 | 9 | 53,489 |
| 1997 | 45,897 | 5,132 | 101 | 2,945 | 24 | 94 | - | 1 | 9 | 54,204 |
| 1998 | 46,770 | 5,027 | 100 | 3,058 | 28 | 95 | - | 1 | 9 | 55,088 |
| 1999 | 47,584 | 5,055 | 105 | 3,141 | 32 | 100 | - | 1 | 11 | 56,029 |
| 2000 | 48,486 | 5,064 | 97 | 3,232 | 34 | 102 | - | 1 | 10 | 57,026 |
| 2001 | 49,321 | 4,969 | 93 | 3,320 | 35 | 108 | - | 1 | 9 | 57,855 |
| 2002 | 50,384 | 4,840 | 89 | 3,468 | 35 | 110 | - | 1 | 8 | 58,935 |
| 2003 | 51,488 | 4,679 | 88 | 3,628 | 36 | 111 | - | 1 | 8 | 60,039 |
| 2004 | 52,651 | 4,457 | 92 | 3,766 | 36 | 113 | - | 1 | 8 | 61,125 |
| 2005 | 53,482 | 4,269 | 77 | 3,827 | 36 | 123 | - | 1 | 8 | 61,823 |
| 2006 | 55,365 | 3,081 | 81 | 3,937 | 37 | 133 | - | 1 | 8 | 62,643 |
| 2007 | 56,451 | 2,621 | 85 | 4,087 | 41 | 136 | - | 1 | 8 | 63,430 |
| 2008 | 57,088 | 2,409 | 88 | 4,160 | 42 | 142 | - | 1 | 9 | 63,940 |
| 2009 | 58,231 | 1,519 | 91 | 4,187 | 51 | 144 | - | 1 | 9 | 64,232 |
| 2010 | 58,455 | 1,475 | 88 | 4,230 | 52 | 149 | - | 1 | 9 | 64,460 |
| 2011 | 58,645 | 1,417 | 86 | 4,266 | 67 | 157 | - | 1 | 9 | 64,648 |
| 2012 | 58,836 | 1,355 | 84 | 4,278 | 67 | 166 | - | 1 | 9 | 64,795 |
| 2013 | 59,043 | 1,356 | 89 | 4,319 | 66 | 168 | - | 1 | 9 | 65,050 |
| 2014 | 59,328 | 1,357 | 89 | 4,357 | 66 | 170 | - | 1 | 9 | 65,377 |
| 2015 | 59,284 | 1,358 | 90 | 4,360 | 67 | 172 | - | 1 | 9 | 65,340 |
| 2016 | 59,700 | 1,359 | 90 | 4,414 | 69 | 174 | - | 1 | 9 | 65,816 |
| 2017 | 60,161 | 1,360 | 91 | 4,469 | 69 | 176 | - | 1 | 9 | 66,336 |
| 2018 | 60,591 | 1,361 | 92 | 4,524 | 70 | 178 | - | 1 | 9 | 66,826 |
| 2019 | 60,998 | 1,362 | 94 | 4,579 | 70 | 180 | - | 1 | 9 | 67,293 |
| 2020 | 61,378 | 1,363 | 95 | 4,635 | 71 | 182 | - | 1 | 9 | 67,734 |
| 2021 | 61,749 | 1,364 | 97 | 4,691 | 71 | 184 | - | 1 | 9 | 68,166 |
| 2022 | 62,094 | 1,365 | 98 | 4,746 | 73 | 186 | - | 1 | 9 | 68,572 |
| 2023 | 62,420 | 1,366 | 99 | 4,801 | 73 | 188 | - | 1 | 9 | 68,957 |
| 2024 | 62,734 | 1,367 | 99 | 4,857 | 73 | 190 | - | 1 | 9 | 69,330 |
| 2025 | 63,038 | 1,368 | 100 | 4,912 | 73 | 192 | - | 1 | 9 | 69,692 |
| 2026 | 63,334 | 1,369 | 100 | 4,968 | 74 | 194 | - | 1 | 9 | 70,049 |
| 2027 | 63,624 | 1,370 | 101 | 5,024 | 74 | 196 | - | 1 | 9 | 70,398 |
| 2028 | 63,907 | 1,371 | 101 | 5,080 | 74 | 198 | - | 1 | 9 | 70,741 |
| 2029 | 64,184 | 1,372 | 102 | 5,137 | 74 | 200 | - | 1 | 9 | 71,079 |
| 2030 | 64,453 | 1,373 | 102 | 5,194 | 75 | 202 | - | 1 | 9 | 71,409 |
| 2031 | 64,718 | 1,374 | 103 | 5,252 | 75 | 204 | - | 1 | 9 | 71,735 |
| 2032 | 64,978 | 1,375 | 103 | 5,310 | 76 | 206 | - | 1 | 9 | 72,057 |
| 2033 | 65,236 | 1,376 | 104 | 5,369 | 76 | 208 | - | 1 | 9 | 72,380 |
| 2034 | 65,493 | 1,377 | 104 | 5,429 | 77 | 210 | - | 1 | 9 | 72,699 |
| 2035 | 65,746 | 1,378 | 105 | 5,489 | 77 | 212 | - | 1 | 9 | 73,017 |
| 2036 | 66,002 | 1,379 | 105 | 5,550 | 77 | 214 | - | 1 | 9 | 73,337 |
| 2037 | 66,262 | 1,380 | 106 | 5,613 | 77 | 216 | - | 1 | 9 | 73,663 |
| 2038 | 66,528 | 1,381 | 106 | 5,676 | 77 | 218 | - | 1 | 9 | 73,996 |
| 2039 | 66,801 | 1,382 | 107 | 5,740 | 77 | 220 | - | 1 | 9 | 74,337 |
| 2040 | 67,082 | 1,383 | 107 | 5,806 | 77 | 222 | - | 1 | 9 | 74,686 |
| 2041 | 67,363 | 1,384 | 108 | 5,873 | 77 | 224 | - | 1 | 9 | 75,039 |
| 2042 | 67,646 | 1,385 | 108 | 5,941 | 77 | 226 | - | 1 | 9 | 75,393 |
| Average Annual Growth Rates | | | | | | | | | | |
| 1983-2012 | 1.5% | -4.1% | 1.6% | 2.3% | 6.1% | 2.5% | -- | 0.0% | 1.8% | 1.2% |
| 1997-2012 | 1.7% | -8.5% | -1.2% | 2.5% | 7.1% | 3.9% | -- | 0.0% | -0.3% | 1.2% |
| 2002-2012 | 1.6% | -12.0% | -0.5% | 2.1% | 6.7% | 4.2% | -- | 0.0% | 0.8% | 1.0% |
| 2007-2012 | 0.8% | -12.4% | -0.2% | 0.9% | 10.3% | 4.1% | -- | 0.0% | 2.4% | 0.4% |
| 2012-2017 | 0.4% | 0.1% | 1.6% | 0.9% | 0.6% | 1.2% | -- | 0.0% | 0.0% | 0.5% |
| 2012-2022 | 0.5% | 0.1% | 1.5% | 1.0% | 0.9% | 1.1% | -- | 0.0% | 0.0% | 0.6% |
| 2012-2032 | 0.5% | 0.1% | 1.0% | 1.1% | 0.6% | 1.1% | -- | 0.0% | 0.0% | 0.5% |
| 2012-2042 | 0.5% | 0.1% | 0.8% | 1.1% | 0.5% | 1.0% | -- | 0.0% | 0.0% | 0.5% |
| 2013-2042 | 0.5% | 0.1% | 0.7% | 1.1% | 0.5% | 1.0% | -- | 0.0% | 0.0% | 0.5% |

Member Forecasts By Class-ND
Minnkota Power Cooperative, Inc.

| Year | Residential | Seasonal | Irrigation | General Commercial | Large Commercial | Street Lighting | Public Authority | Resale RUS | Resale Other | Total Members |
|------------------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------------|-------------------|---------------------|----------------------|
| 1983 | 22,099 | 399 | 196 | 2,378 | 45 | 139 | 111 | - | 5 | 25,372 |
| 1984 | 22,253 | 402 | 200 | 2,433 | 46 | 138 | 112 | - | 3 | 25,588 |
| 1985 | 22,574 | 426 | 200 | 2,499 | 47 | 139 | 112 | 0 | 3 | 25,999 |
| 1986 | 23,099 | 453 | 200 | 2,576 | 47 | 145 | 111 | - | 3 | 26,634 |
| 1987 | 23,341 | 445 | 200 | 2,644 | 48 | 150 | 112 | - | 3 | 26,942 |
| 1988 | 23,488 | 456 | 205 | 2,668 | 49 | 147 | 112 | 1 | 3 | 27,129 |
| 1989 | 24,056 | 469 | 207 | 2,716 | 49 | 166 | 112 | - | 2 | 27,777 |
| 1990 | 24,485 | 476 | 210 | 2,796 | 51 | 179 | 112 | - | 2 | 28,311 |
| 1991 | 24,919 | 479 | 243 | 2,913 | 52 | 196 | 113 | - | 2 | 28,917 |
| 1992 | 25,742 | 476 | 278 | 3,001 | 52 | 210 | 113 | - | 2 | 29,874 |
| 1993 | 26,643 | 454 | 289 | 3,111 | 52 | 221 | 112 | - | 2 | 30,885 |
| 1994 | 27,572 | 428 | 298 | 3,194 | 53 | 236 | 112 | - | 2 | 31,895 |
| 1995 | 28,333 | 428 | 303 | 3,337 | 53 | 248 | 113 | - | 2 | 32,817 |
| 1996 | 29,405 | 420 | 310 | 3,377 | 82 | 258 | 111 | - | 2 | 33,966 |
| 1997 | 29,867 | 408 | 322 | 3,438 | 83 | 275 | 111 | - | 2 | 34,505 |
| 1998 | 30,642 | 396 | 333 | 3,590 | 86 | 289 | 111 | - | 2 | 35,448 |
| 1999 | 31,298 | 391 | 338 | 3,838 | 93 | 295 | 103 | - | 2 | 36,358 |
| 2000 | 32,378 | 380 | 291 | 3,834 | 76 | 314 | 87 | - | 2 | 37,362 |
| 2001 | 35,723 | - | 266 | 2,506 | 77 | 281 | 25 | - | 3 | 38,882 |
| 2002 | 36,855 | 52 | 272 | 2,482 | 81 | 278 | 26 | - | 3 | 40,048 |
| 2003 | 38,462 | - | 315 | 2,756 | 83 | 242 | 28 | - | 2 | 41,888 |
| 2004 | 40,313 | - | 330 | 2,873 | 89 | 271 | 28 | - | 2 | 43,905 |
| 2005 | 42,391 | - | 329 | 3,042 | 91 | 304 | 28 | - | 2 | 46,186 |
| 2006 | 44,320 | - | 329 | 3,243 | 104 | 315 | 26 | - | 2 | 48,339 |
| 2007 | 45,794 | - | 329 | 3,314 | 113 | 374 | 28 | - | 2 | 49,952 |
| 2008 | 46,995 | - | 333 | 3,526 | 116 | 392 | 29 | - | 2 | 51,392 |
| 2009 | 47,962 | - | 336 | 3,684 | 127 | 409 | 29 | - | 2 | 52,549 |
| 2010 | 48,777 | - | 342 | 3,852 | 133 | 420 | 29 | - | 2 | 53,556 |
| 2011 | 49,682 | - | 339 | 3,964 | 146 | 433 | 28 | - | 2 | 54,594 |
| 2012 | 51,078 | - | 350 | 4,130 | 150 | 444 | 27 | - | 2 | 56,181 |
| 2013 | 52,646 | - | 352 | 4,260 | 154 | 453 | 27 | - | 2 | 57,894 |
| 2014 | 54,225 | - | 354 | 4,390 | 163 | 462 | 27 | - | 2 | 59,623 |
| 2015 | 55,799 | - | 356 | 4,521 | 166 | 471 | 27 | - | 2 | 61,341 |
| 2016 | 57,325 | - | 358 | 4,652 | 172 | 480 | 27 | - | 2 | 63,016 |
| 2017 | 58,801 | - | 360 | 4,783 | 176 | 490 | 27 | - | 2 | 64,639 |
| 2018 | 60,236 | - | 362 | 4,912 | 181 | 500 | 27 | - | 2 | 66,220 |
| 2019 | 61,636 | - | 364 | 5,040 | 184 | 510 | 27 | - | 2 | 67,763 |
| 2020 | 63,000 | - | 366 | 5,166 | 189 | 520 | 27 | - | 2 | 69,270 |
| 2021 | 64,328 | - | 368 | 5,291 | 192 | 530 | 27 | - | 2 | 70,737 |
| 2022 | 65,621 | - | 370 | 5,413 | 196 | 541 | 27 | - | 2 | 72,170 |
| 2023 | 66,878 | - | 372 | 5,535 | 200 | 552 | 27 | - | 2 | 73,566 |
| 2024 | 68,099 | - | 374 | 5,655 | 204 | 563 | 27 | - | 2 | 74,923 |
| 2025 | 69,285 | - | 376 | 5,772 | 207 | 574 | 27 | - | 2 | 76,242 |
| 2026 | 70,435 | - | 378 | 5,888 | 211 | 585 | 27 | - | 2 | 77,525 |
| 2027 | 71,551 | - | 380 | 6,001 | 214 | 597 | 27 | - | 2 | 78,772 |
| 2028 | 72,631 | - | 382 | 6,114 | 218 | 609 | 27 | - | 2 | 79,982 |
| 2029 | 73,676 | - | 384 | 6,224 | 221 | 621 | 27 | - | 2 | 81,155 |
| 2030 | 74,685 | - | 386 | 6,333 | 225 | 633 | 27 | - | 2 | 82,290 |
| 2031 | 75,659 | - | 388 | 6,439 | 227 | 646 | 27 | - | 2 | 83,388 |
| 2032 | 76,599 | - | 390 | 6,544 | 231 | 659 | 27 | - | 2 | 84,451 |
| 2033 | 77,503 | - | 392 | 6,647 | 234 | 672 | 27 | - | 2 | 85,476 |
| 2034 | 78,372 | - | 394 | 6,748 | 237 | 685 | 27 | - | 2 | 86,465 |
| 2035 | 79,206 | - | 396 | 6,848 | 240 | 699 | 27 | - | 2 | 87,417 |
| 2036 | 80,005 | - | 398 | 6,945 | 243 | 713 | 27 | - | 2 | 88,333 |
| 2037 | 80,794 | - | 400 | 7,041 | 246 | 727 | 27 | - | 2 | 89,237 |
| 2038 | 81,574 | - | 402 | 7,135 | 249 | 742 | 27 | - | 2 | 90,130 |
| 2039 | 82,343 | - | 404 | 7,227 | 251 | 757 | 27 | - | 2 | 91,011 |
| 2040 | 83,103 | - | 406 | 7,317 | 255 | 772 | 27 | - | 2 | 91,881 |
| 2041 | 83,853 | - | 408 | 7,406 | 257 | 787 | 27 | - | 2 | 92,739 |
| 2042 | 84,593 | - | 410 | 7,492 | 260 | 803 | 27 | - | 2 | 93,586 |
| Average Annual Growth Rates | | | | | | | | | | |
| 1983-2012 | 2.9% | -100.0% | 2.0% | 1.9% | 4.2% | 4.1% | -4.8% | -- | -3.1% | 2.8% |
| 1997-2012 | 3.6% | -100.0% | 0.6% | 1.2% | 4.0% | 3.2% | -9.0% | -- | 0.0% | 3.3% |
| 2002-2012 | 3.3% | -100.0% | 2.5% | 5.2% | 6.4% | 4.8% | 0.4% | -- | -4.0% | 3.4% |
| 2007-2012 | 2.2% | -- | 1.2% | 4.5% | 5.8% | 3.5% | -0.5% | -- | 0.0% | 2.4% |
| 2012-2017 | 2.9% | -- | 0.6% | 3.0% | 3.3% | 2.0% | 0.0% | -- | 0.0% | 2.8% |
| 2012-2022 | 2.5% | -- | 0.6% | 2.7% | 2.7% | 2.0% | 0.0% | -- | 0.0% | 2.5% |
| 2012-2032 | 2.0% | -- | 0.5% | 2.3% | 2.2% | 2.0% | 0.0% | -- | 0.0% | 2.1% |
| 2012-2042 | 1.7% | -- | 0.5% | 2.0% | 1.8% | 2.0% | 0.0% | -- | 0.0% | 1.7% |
| 2013-2042 | 1.6% | -- | 0.5% | 2.0% | 1.8% | 2.0% | 0.0% | -- | 0.0% | 1.7% |

Seasonal Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Red | Wild | Total Members |
|-----------------------------|----------|--------|-------------|---------|---------|-------|-----|------|-------|--------|---------|---------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Roseau | Rice | |
| 1983 | 1,549 | - | - | 369 | 399 | 866 | - | - | - | 157 | 1,596 | 4,936 |
| 1984 | 1,625 | - | - | 361 | 402 | 904 | - | - | - | 161 | 1,609 | 5,061 |
| 1985 | 1,676 | - | - | 360 | 426 | 928 | - | - | - | 165 | 1,583 | 5,137 |
| 1986 | 1,719 | - | - | 358 | 453 | 974 | - | - | - | 166 | 1,566 | 5,236 |
| 1987 | 1,754 | - | - | 362 | 445 | 1,036 | - | - | - | 171 | 1,588 | 5,356 |
| 1988 | 1,788 | - | - | 375 | 456 | 1,079 | - | - | - | 179 | 1,592 | 5,469 |
| 1989 | 1,785 | - | - | 382 | 469 | 1,101 | - | - | - | 183 | 1,581 | 5,501 |
| 1990 | 1,826 | - | - | 388 | 476 | 1,116 | - | - | - | 189 | 1,530 | 5,525 |
| 1991 | 1,880 | - | - | 384 | 479 | 1,169 | - | - | - | 196 | 1,505 | 5,613 |
| 1992 | 1,927 | - | - | 394 | 476 | 1,227 | - | - | - | 204 | 1,486 | 5,714 |
| 1993 | 1,962 | - | - | 413 | 454 | 1,253 | - | - | - | 218 | 1,462 | 5,761 |
| 1994 | 2,002 | - | - | 429 | 428 | 1,286 | - | - | - | 229 | 1,453 | 5,828 |
| 1995 | 1,990 | - | - | 437 | 428 | 1,311 | - | - | - | 244 | 1,430 | 5,840 |
| 1996 | 2,016 | - | - | 347 | 420 | 1,312 | - | - | - | 257 | 1,394 | 5,746 |
| 1997 | 1,995 | - | - | 173 | 408 | 1,340 | - | - | - | 260 | 1,365 | 5,540 |
| 1998 | 1,999 | - | - | 32 | 396 | 1,367 | - | - | - | 270 | 1,359 | 5,422 |
| 1999 | 1,984 | - | - | - | 391 | 1,406 | - | - | - | 278 | 1,387 | 5,447 |
| 2000 | 1,943 | - | - | - | 380 | 1,442 | - | - | - | 308 | 1,371 | 5,443 |
| 2001 | 1,870 | - | - | - | - | 1,446 | - | - | - | 305 | 1,349 | 4,969 |
| 2002 | 1,745 | - | - | - | 52 | 1,468 | - | - | - | 314 | 1,313 | 4,892 |
| 2003 | 1,618 | - | - | - | - | 1,479 | - | - | - | 323 | 1,260 | 4,679 |
| 2004 | 1,463 | - | - | - | - | 1,493 | - | - | - | 337 | 1,164 | 4,457 |
| 2005 | 1,373 | - | - | - | - | 1,501 | - | - | - | 344 | 1,050 | 4,269 |
| 2006 | 1,201 | - | - | - | - | 1,353 | - | - | - | 361 | 166 | 3,081 |
| 2007 | 1,001 | - | - | - | - | 1,258 | - | - | - | 363 | - | 2,621 |
| 2008 | 856 | - | - | - | - | 1,187 | - | - | - | 367 | - | 2,409 |
| 2009 | - | - | - | - | - | 1,146 | - | - | - | 374 | - | 1,519 |
| 2010 | - | - | - | - | - | 1,098 | - | - | - | 377 | - | 1,475 |
| 2011 | - | - | - | - | - | 1,035 | - | - | - | 382 | - | 1,417 |
| 2012 | - | - | - | - | - | 969 | - | - | - | 386 | - | 1,355 |
| 2013 | - | - | - | - | - | 967 | - | - | - | 389 | - | 1,356 |
| 2014 | - | - | - | - | - | 965 | - | - | - | 392 | - | 1,357 |
| 2015 | - | - | - | - | - | 963 | - | - | - | 395 | - | 1,358 |
| 2016 | - | - | - | - | - | 961 | - | - | - | 398 | - | 1,359 |
| 2017 | - | - | - | - | - | 959 | - | - | - | 401 | - | 1,360 |
| 2018 | - | - | - | - | - | 957 | - | - | - | 404 | - | 1,361 |
| 2019 | - | - | - | - | - | 955 | - | - | - | 407 | - | 1,362 |
| 2020 | - | - | - | - | - | 953 | - | - | - | 410 | - | 1,363 |
| 2021 | - | - | - | - | - | 951 | - | - | - | 413 | - | 1,364 |
| 2022 | - | - | - | - | - | 949 | - | - | - | 416 | - | 1,365 |
| 2023 | - | - | - | - | - | 947 | - | - | - | 419 | - | 1,366 |
| 2024 | - | - | - | - | - | 945 | - | - | - | 422 | - | 1,367 |
| 2025 | - | - | - | - | - | 943 | - | - | - | 425 | - | 1,368 |
| 2026 | - | - | - | - | - | 941 | - | - | - | 428 | - | 1,369 |
| 2027 | - | - | - | - | - | 939 | - | - | - | 431 | - | 1,370 |
| 2028 | - | - | - | - | - | 937 | - | - | - | 434 | - | 1,371 |
| 2029 | - | - | - | - | - | 935 | - | - | - | 437 | - | 1,372 |
| 2030 | - | - | - | - | - | 933 | - | - | - | 440 | - | 1,373 |
| 2031 | - | - | - | - | - | 931 | - | - | - | 443 | - | 1,374 |
| 2032 | - | - | - | - | - | 929 | - | - | - | 446 | - | 1,375 |
| 2033 | - | - | - | - | - | 927 | - | - | - | 449 | - | 1,376 |
| 2034 | - | - | - | - | - | 925 | - | - | - | 452 | - | 1,377 |
| 2035 | - | - | - | - | - | 923 | - | - | - | 455 | - | 1,378 |
| 2036 | - | - | - | - | - | 921 | - | - | - | 458 | - | 1,379 |
| 2037 | - | - | - | - | - | 919 | - | - | - | 461 | - | 1,380 |
| 2038 | - | - | - | - | - | 917 | - | - | - | 464 | - | 1,381 |
| 2039 | - | - | - | - | - | 915 | - | - | - | 467 | - | 1,382 |
| 2040 | - | - | - | - | - | 913 | - | - | - | 470 | - | 1,383 |
| 2041 | - | - | - | - | - | 911 | - | - | - | 473 | - | 1,384 |
| 2042 | - | - | - | - | - | 909 | - | - | - | 476 | - | 1,385 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | -100.0% | -- | -- | -100.0% | -100.0% | 0.4% | -- | -- | -- | 3.2% | -100.0% | -4.4% |
| 1997-2012 | -100.0% | -- | -- | -100.0% | -100.0% | -2.1% | -- | -- | -- | 2.7% | -100.0% | -9.0% |
| 2002-2012 | -100.0% | -- | -- | -- | -100.0% | -4.1% | -- | -- | -- | 2.1% | -100.0% | -12.1% |
| 2007-2012 | -100.0% | -- | -- | -- | -- | -5.1% | -- | -- | -- | 1.2% | -- | -12.4% |
| 2012-2017 | -- | -- | -- | -- | -- | -0.2% | -- | -- | -- | 0.8% | -- | 0.1% |
| 2012-2022 | -- | -- | -- | -- | -- | -0.2% | -- | -- | -- | 0.8% | -- | 0.1% |
| 2012-2032 | -- | -- | -- | -- | -- | -0.2% | -- | -- | -- | 0.7% | -- | 0.1% |
| 2012-2042 | -- | -- | -- | -- | -- | -0.2% | -- | -- | -- | 0.7% | -- | 0.1% |
| 2013-2042 | -- | -- | -- | -- | -- | -0.2% | -- | -- | -- | 0.7% | -- | 0.1% |

Irrigation Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | | Red | Red | Red | Wild | Total Members |
|------|----------|--------|-------------|------|-------|-------|-----|------|-------|--------|------|---------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Roseau | Rice | |
| 1983 | - | 141 | - | 24 | 55 | - | 11 | - | 10 | - | 8 | 249 |
| 1984 | 9 | 145 | - | 24 | 55 | - | 11 | - | 11 | - | 11 | 266 |
| 1985 | 11 | 149 | - | 23 | 51 | - | 11 | - | 11 | - | 10 | 266 |
| 1986 | 12 | 150 | - | 24 | 51 | - | 10 | - | 11 | - | 9 | 267 |
| 1987 | 13 | 149 | - | 24 | 51 | - | 7 | - | 11 | - | 8 | 263 |
| 1988 | 13 | 151 | - | 20 | 54 | - | 5 | - | 10 | - | 10 | 262 |
| 1989 | 11 | 152 | - | 18 | 55 | - | 5 | - | 10 | - | 8 | 259 |
| 1990 | 18 | 154 | - | 20 | 56 | - | 5 | - | 12 | - | 8 | 273 |
| 1991 | 22 | 156 | - | 20 | 87 | - | 7 | 9 | 16 | - | 7 | 325 |
| 1992 | 25 | 164 | - | 23 | 114 | - | 9 | 12 | 20 | - | 8 | 374 |
| 1993 | 26 | 169 | - | 23 | 120 | - | 9 | 12 | 24 | - | 13 | 396 |
| 1994 | 26 | 172 | - | 20 | 126 | - | 10 | 12 | 26 | - | 13 | 404 |
| 1995 | 26 | 173 | - | 15 | 130 | - | 9 | 12 | 26 | - | 13 | 404 |
| 1996 | 26 | 178 | - | 13 | 132 | - | 14 | 12 | 25 | - | 13 | 414 |
| 1997 | 24 | 185 | - | 13 | 137 | - | 16 | 12 | 25 | - | 12 | 423 |
| 1998 | 22 | 190 | - | 15 | 143 | - | 16 | 12 | 24 | - | 12 | 433 |
| 1999 | 27 | 191 | - | 13 | 147 | - | 15 | 13 | 25 | - | 12 | 443 |
| 2000 | 22 | 188 | - | 14 | 104 | - | 14 | 13 | 24 | - | 10 | 388 |
| 2001 | 21 | 184 | - | 12 | 82 | - | 13 | 11 | 24 | - | 11 | 359 |
| 2002 | 20 | 188 | - | 12 | 83 | - | 12 | 11 | 23 | - | 11 | 361 |
| 2003 | 20 | 190 | - | 11 | 124 | - | 12 | 11 | 23 | - | 11 | 403 |
| 2004 | 21 | 190 | - | 15 | 140 | - | 13 | 11 | 23 | - | 10 | 422 |
| 2005 | 20 | 188 | - | 13 | 141 | - | 13 | 11 | 10 | - | 11 | 406 |
| 2006 | 20 | 187 | - | 14 | 142 | - | 15 | 11 | 10 | - | 11 | 410 |
| 2007 | 19 | 187 | - | 16 | 142 | - | 19 | 11 | 10 | - | 10 | 414 |
| 2008 | 19 | 188 | - | 17 | 145 | - | 21 | 11 | 10 | - | 10 | 421 |
| 2009 | 20 | 189 | - | 17 | 147 | - | 24 | 11 | 8 | - | 11 | 427 |
| 2010 | 18 | 190 | - | 17 | 152 | - | 25 | 11 | 7 | - | 11 | 430 |
| 2011 | 15 | 187 | - | 17 | 152 | - | 25 | 11 | 7 | - | 11 | 426 |
| 2012 | 15 | 190 | - | 13 | 159 | - | 26 | 12 | 7 | - | 11 | 434 |
| 2013 | 15 | 190 | - | 13 | 161 | - | 27 | 12 | 7 | - | 15 | 441 |
| 2014 | 15 | 190 | - | 13 | 163 | - | 27 | 12 | 7 | - | 15 | 443 |
| 2015 | 15 | 190 | - | 13 | 165 | - | 28 | 12 | 7 | - | 15 | 446 |
| 2016 | 15 | 190 | - | 13 | 167 | - | 28 | 12 | 7 | - | 15 | 448 |
| 2017 | 15 | 190 | - | 13 | 169 | - | 29 | 12 | 7 | - | 15 | 451 |
| 2018 | 15 | 190 | - | 13 | 171 | - | 29 | 12 | 7 | - | 16 | 454 |
| 2019 | 15 | 190 | - | 13 | 173 | - | 30 | 12 | 7 | - | 17 | 458 |
| 2020 | 15 | 190 | - | 13 | 175 | - | 30 | 12 | 7 | - | 18 | 461 |
| 2021 | 15 | 190 | - | 13 | 177 | - | 31 | 12 | 7 | - | 19 | 465 |
| 2022 | 15 | 190 | - | 13 | 179 | - | 31 | 12 | 7 | - | 20 | 468 |
| 2023 | 15 | 190 | - | 13 | 181 | - | 32 | 12 | 7 | - | 20 | 471 |
| 2024 | 15 | 190 | - | 13 | 183 | - | 32 | 12 | 7 | - | 20 | 473 |
| 2025 | 15 | 190 | - | 13 | 185 | - | 33 | 12 | 7 | - | 20 | 476 |
| 2026 | 15 | 190 | - | 13 | 187 | - | 33 | 12 | 7 | - | 20 | 478 |
| 2027 | 15 | 190 | - | 13 | 189 | - | 34 | 12 | 7 | - | 20 | 481 |
| 2028 | 15 | 190 | - | 13 | 191 | - | 34 | 12 | 7 | - | 20 | 483 |
| 2029 | 15 | 190 | - | 13 | 193 | - | 35 | 12 | 7 | - | 20 | 486 |
| 2030 | 15 | 190 | - | 13 | 195 | - | 35 | 12 | 7 | - | 20 | 488 |
| 2031 | 15 | 190 | - | 13 | 197 | - | 36 | 12 | 7 | - | 20 | 491 |
| 2032 | 15 | 190 | - | 13 | 199 | - | 36 | 12 | 7 | - | 20 | 493 |
| 2033 | 15 | 190 | - | 13 | 201 | - | 37 | 12 | 7 | - | 20 | 496 |
| 2034 | 15 | 190 | - | 13 | 203 | - | 37 | 12 | 7 | - | 20 | 498 |
| 2035 | 15 | 190 | - | 13 | 205 | - | 38 | 12 | 7 | - | 20 | 501 |
| 2036 | 15 | 190 | - | 13 | 207 | - | 38 | 12 | 7 | - | 20 | 503 |
| 2037 | 15 | 190 | - | 13 | 209 | - | 39 | 12 | 7 | - | 20 | 506 |
| 2038 | 15 | 190 | - | 13 | 211 | - | 39 | 12 | 7 | - | 20 | 508 |
| 2039 | 15 | 190 | - | 13 | 213 | - | 40 | 12 | 7 | - | 20 | 511 |
| 2040 | 15 | 190 | - | 13 | 215 | - | 40 | 12 | 7 | - | 20 | 513 |
| 2041 | 15 | 190 | - | 13 | 217 | - | 41 | 12 | 7 | - | 20 | 516 |
| 2042 | 15 | 190 | - | 13 | 219 | - | 41 | 12 | 7 | - | 20 | 518 |

Average Annual Growth Rates

| | | | | | | | | | | | | |
|-----------|-------|------|----|-------|------|----|------|------|--------|----|-------|------|
| 1983-2012 | -- | 1.0% | -- | -2.1% | 3.7% | -- | 3.0% | -- | -1.4% | -- | 1.1% | 1.9% |
| 1997-2012 | -3.0% | 0.2% | -- | 0.2% | 1.0% | -- | 3.4% | 0.1% | -8.0% | -- | -0.6% | 0.2% |
| 2002-2012 | -2.4% | 0.1% | -- | 0.7% | 6.7% | -- | 7.9% | 1.0% | -11.4% | -- | 0.0% | 1.9% |
| 2007-2012 | -4.6% | 0.3% | -- | -4.2% | 2.3% | -- | 6.8% | 2.0% | -6.9% | -- | 1.9% | 0.9% |
| 2012-2017 | 0.0% | 0.0% | -- | 0.0% | 1.2% | -- | 2.2% | 0.0% | 0.0% | -- | 6.4% | 0.8% |
| 2012-2022 | 0.0% | 0.0% | -- | 0.0% | 1.2% | -- | 1.8% | 0.0% | 0.0% | -- | 6.2% | 0.8% |
| 2012-2032 | 0.0% | 0.0% | -- | 0.0% | 1.1% | -- | 1.6% | 0.0% | 0.0% | -- | 3.0% | 0.6% |
| 2012-2042 | 0.0% | 0.0% | -- | 0.0% | 1.1% | -- | 1.5% | 0.0% | 0.0% | -- | 2.0% | 0.6% |
| 2013-2042 | 0.0% | 0.0% | -- | 0.0% | 1.1% | -- | 1.5% | 0.0% | 0.0% | -- | 1.0% | 0.6% |

Street Lighting Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | North | | Red | Red | Wild | | Total Members | |
|-----------------------------|----------|--------|-------------|------|---------|-------|-----|-------|-------|--------|---------------|-------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | Roseau | | Rice |
| 1983 | 25 | 54 | 1 | - | 85 | 22 | - | 2 | 3 | 2 | 27 | 221 |
| 1984 | 25 | 56 | 1 | - | 81 | 21 | - | 2 | 3 | 2 | 28 | 219 |
| 1985 | 25 | 57 | - | - | 81 | 21 | - | 2 | 3 | 2 | 27 | 219 |
| 1986 | 26 | 65 | - | - | 80 | 20 | - | 2 | 3 | 2 | 27 | 225 |
| 1987 | 28 | 70 | - | - | 80 | 19 | - | 2 | 3 | 2 | 27 | 231 |
| 1988 | 28 | 71 | - | - | 76 | 19 | - | 2 | 3 | 2 | 28 | 229 |
| 1989 | 28 | 90 | - | - | 76 | 18 | - | 2 | 3 | 2 | 29 | 248 |
| 1990 | 28 | 99 | - | - | 80 | 18 | - | 2 | 3 | 2 | 33 | 265 |
| 1991 | 28 | 115 | - | - | 81 | 18 | - | 2 | 3 | 2 | 38 | 286 |
| 1992 | 28 | 128 | - | - | 82 | 17 | - | 2 | 3 | 2 | 39 | 301 |
| 1993 | 28 | 139 | - | - | 82 | 18 | - | 2 | 3 | 2 | 39 | 312 |
| 1994 | 27 | 153 | - | - | 83 | 16 | - | 2 | 3 | 2 | 39 | 325 |
| 1995 | 27 | 164 | - | - | 83 | 17 | - | 2 | 3 | 2 | 41 | 339 |
| 1996 | 27 | 173 | - | - | 85 | 18 | - | 2 | 3 | 2 | 42 | 352 |
| 1997 | 26 | 188 | - | - | 87 | 19 | - | 2 | 3 | 2 | 42 | 369 |
| 1998 | 26 | 199 | - | - | 89 | 19 | - | 2 | 3 | 2 | 43 | 383 |
| 1999 | 26 | 205 | - | - | 90 | 19 | - | 2 | 7 | 2 | 44 | 394 |
| 2000 | 27 | 224 | - | - | 90 | 19 | - | 2 | 7 | 2 | 45 | 417 |
| 2001 | 28 | 242 | - | - | 39 | 21 | - | 4 | 7 | 3 | 45 | 389 |
| 2002 | 27 | 252 | - | - | 26 | 22 | - | 4 | 7 | 3 | 46 | 387 |
| 2003 | 28 | 242 | - | - | - | 24 | - | 4 | 7 | 2 | 47 | 354 |
| 2004 | 27 | 271 | - | - | - | 24 | - | 4 | 7 | 2 | 49 | 385 |
| 2005 | 29 | 304 | - | - | - | 25 | - | 4 | 16 | 2 | 48 | 427 |
| 2006 | 39 | 315 | - | - | - | 25 | - | 4 | 15 | 2 | 48 | 448 |
| 2007 | 42 | 374 | - | - | - | 25 | - | 4 | 14 | 2 | 49 | 509 |
| 2008 | 45 | 392 | - | - | - | 25 | - | 4 | 15 | 4 | 49 | 534 |
| 2009 | 50 | 409 | - | - | - | 24 | - | 4 | 15 | 4 | 47 | 553 |
| 2010 | 54 | 420 | - | - | - | 24 | - | 4 | 16 | 4 | 47 | 569 |
| 2011 | 62 | 433 | - | - | - | 23 | - | 5 | 17 | 4 | 47 | 590 |
| 2012 | 66 | 444 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 610 |
| 2013 | 68 | 453 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 621 |
| 2014 | 70 | 462 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 632 |
| 2015 | 72 | 471 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 643 |
| 2016 | 74 | 480 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 654 |
| 2017 | 76 | 490 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 666 |
| 2018 | 78 | 500 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 678 |
| 2019 | 80 | 510 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 690 |
| 2020 | 82 | 520 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 702 |
| 2021 | 84 | 530 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 714 |
| 2022 | 86 | 541 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 727 |
| 2023 | 88 | 552 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 740 |
| 2024 | 90 | 563 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 753 |
| 2025 | 92 | 574 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 766 |
| 2026 | 94 | 585 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 779 |
| 2027 | 96 | 597 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 793 |
| 2028 | 98 | 609 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 807 |
| 2029 | 100 | 621 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 821 |
| 2030 | 102 | 633 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 835 |
| 2031 | 104 | 646 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 850 |
| 2032 | 106 | 659 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 865 |
| 2033 | 108 | 672 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 880 |
| 2034 | 110 | 685 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 895 |
| 2035 | 112 | 699 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 911 |
| 2036 | 114 | 713 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 927 |
| 2037 | 116 | 727 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 943 |
| 2038 | 118 | 742 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 960 |
| 2039 | 120 | 757 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 977 |
| 2040 | 122 | 772 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 994 |
| 2041 | 124 | 787 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 1,011 |
| 2042 | 126 | 803 | - | - | - | 23 | - | 9 | 16 | 5 | 47 | 1,029 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | 3.3% | 7.5% | -100.0% | -- | -100.0% | 0.2% | -- | 5.3% | 6.0% | 3.1% | 2.0% | 3.6% |
| 1997-2012 | 6.3% | 5.9% | -- | -- | -100.0% | 1.3% | -- | 10.5% | 12.0% | 6.1% | 0.8% | 3.4% |
| 2002-2012 | 9.2% | 5.9% | -- | -- | -100.0% | 0.3% | -- | 8.4% | 8.9% | 6.1% | 0.2% | 4.6% |
| 2007-2012 | 9.4% | 3.5% | -- | -- | -- | -1.7% | -- | 17.6% | 3.0% | 19.3% | -0.8% | 3.7% |
| 2012-2017 | 2.9% | 2.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | 0.0% | 0.0% | 1.8% |
| 2012-2022 | 2.7% | 2.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | 0.0% | 0.0% | 1.8% |
| 2012-2032 | 2.4% | 2.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | 0.0% | 0.0% | 1.8% |
| 2012-2042 | 2.2% | 2.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | 0.0% | 0.0% | 1.8% |
| 2013-2042 | 2.2% | 2.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | 0.0% | 0.0% | 1.8% |

Public Authority Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | North | | Red | Red | Wild | Total | | |
|-----------------------------|----------|---------|-------------|------|--------|------|-----|------|------|-------|-------|--------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | | | River | Roseau |
| 1983 | - | 11 | 26 | - | 74 | - | - | - | - | - | - | 111 |
| 1984 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1985 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1986 | - | 11 | 26 | - | 74 | - | - | - | - | - | - | 111 |
| 1987 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1988 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1989 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1990 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1991 | - | 11 | 28 | - | 74 | - | - | - | - | - | - | 113 |
| 1992 | - | 11 | 28 | - | 74 | - | - | - | - | - | - | 113 |
| 1993 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1994 | - | 11 | 27 | - | 74 | - | - | - | - | - | - | 112 |
| 1995 | - | 11 | 28 | - | 74 | - | - | - | - | - | - | 113 |
| 1996 | - | 11 | 26 | - | 74 | - | - | - | - | - | - | 111 |
| 1997 | - | 11 | 26 | - | 74 | - | - | - | - | - | - | 111 |
| 1998 | - | 11 | 26 | - | 74 | - | - | - | - | - | - | 111 |
| 1999 | - | 11 | 26 | - | 66 | - | - | - | - | - | - | 103 |
| 2000 | - | 5 | 25 | - | 57 | - | - | - | - | - | - | 87 |
| 2001 | - | - | 24 | - | 1 | - | - | - | - | - | - | 25 |
| 2002 | - | - | 25 | - | 1 | - | - | - | - | - | - | 26 |
| 2003 | - | - | 27 | - | 1 | - | - | - | - | - | - | 28 |
| 2004 | - | - | 27 | - | 1 | - | - | - | - | - | - | 28 |
| 2005 | - | - | 27 | - | 1 | - | - | - | - | - | - | 28 |
| 2006 | - | - | 25 | - | 1 | - | - | - | - | - | - | 26 |
| 2007 | - | - | 26 | - | 2 | - | - | - | - | - | - | 28 |
| 2008 | - | - | 27 | - | 2 | - | - | - | - | - | - | 29 |
| 2009 | - | - | 27 | - | 2 | - | - | - | - | - | - | 29 |
| 2010 | - | - | 27 | - | 2 | - | - | - | - | - | - | 29 |
| 2011 | - | - | 26 | - | 2 | - | - | - | - | - | - | 28 |
| 2012 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2013 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2014 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2015 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2016 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2017 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2018 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2019 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2020 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2021 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2022 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2023 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2024 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2025 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2026 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2027 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2028 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2029 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2030 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2031 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2032 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2033 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2034 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2035 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2036 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2037 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2038 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2039 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2040 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2041 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| 2042 | - | - | 25 | - | 2 | - | - | - | - | - | - | 27 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | -- | -100.0% | -0.2% | -- | -11.7% | -- | -- | -- | -- | -- | -- | -4.8% |
| 1997-2012 | -- | -100.0% | -0.3% | -- | -21.4% | -- | -- | -- | -- | -- | -- | -9.0% |
| 2002-2012 | -- | -- | 0.0% | -- | 7.2% | -- | -- | -- | -- | -- | -- | 0.4% |
| 2007-2012 | -- | -- | -0.5% | -- | 0.0% | -- | -- | -- | -- | -- | -- | -0.5% |
| 2012-2017 | -- | -- | 0.0% | -- | 0.0% | -- | -- | -- | -- | -- | -- | 0.0% |
| 2012-2022 | -- | -- | 0.0% | -- | 0.0% | -- | -- | -- | -- | -- | -- | 0.0% |
| 2012-2032 | -- | -- | 0.0% | -- | 0.0% | -- | -- | -- | -- | -- | -- | 0.0% |
| 2012-2042 | -- | -- | 0.0% | -- | 0.0% | -- | -- | -- | -- | -- | -- | 0.0% |
| 2013-2042 | -- | -- | 0.0% | -- | 0.0% | -- | -- | -- | -- | -- | -- | 0.0% |

Resale-Other Customer Forecasts By Member
Minnkota Power Cooperative, Inc.

| Year | Cass | | | Clearwater- | | North | | Red | Red | Roseau | Wild | Total |
|-----------------------------|----------|--------|----------|-------------|-------|-------|-------|------|---------|--------|---------|-------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | PKM | Lake | River | | Rice | |
| 1983 | 3 | - | 1 | - | 4 | - | 2 | - | - | - | 0 | 10 |
| 1984 | 3 | - | 1 | - | 2 | - | 2 | - | - | - | - | 8 |
| 1985 | 3 | - | 1 | - | 2 | - | 2 | - | - | - | - | 8 |
| 1986 | 4 | - | 1 | - | 2 | - | 2 | - | - | - | - | 9 |
| 1987 | 5 | - | 1 | - | 2 | - | 2 | - | - | - | - | 10 |
| 1988 | 5 | - | 1 | - | 2 | - | 2 | - | - | - | - | 10 |
| 1989 | 5 | - | - | - | 2 | - | 2 | - | - | - | - | 9 |
| 1990 | 5 | - | - | - | 2 | - | 2 | - | - | - | - | 9 |
| 1991 | 6 | - | - | - | 2 | - | 2 | - | - | - | - | 10 |
| 1992 | 6 | - | - | - | 2 | - | 2 | - | - | - | - | 10 |
| 1993 | 6 | - | - | - | 2 | - | 3 | - | 0 | - | - | 11 |
| 1994 | 6 | - | - | - | 2 | - | 3 | - | 0 | - | - | 11 |
| 1995 | 6 | - | - | - | 2 | - | 3 | - | 0 | - | - | 11 |
| 1996 | 6 | - | - | - | 2 | - | 3 | - | 0 | - | - | 11 |
| 1997 | 6 | - | - | - | 2 | - | 3 | - | 0 | - | - | 11 |
| 1998 | 6 | - | - | - | 2 | - | 3 | - | 0 | - | - | 11 |
| 1999 | 6 | - | - | - | 2 | - | 3 | - | 2 | - | - | 13 |
| 2000 | 6 | - | - | - | 2 | - | 2 | - | 2 | - | - | 12 |
| 2001 | 6 | - | 1 | - | 2 | - | 2 | - | 1 | - | - | 12 |
| 2002 | 6 | - | 1 | - | 2 | - | 2 | - | 0 | - | - | 11 |
| 2003 | 6 | - | - | - | 2 | - | 2 | - | 0 | - | - | 10 |
| 2004 | 6 | - | - | - | 2 | - | 2 | - | 0 | - | - | 10 |
| 2005 | 6 | - | - | - | 2 | - | 2 | - | 0 | - | - | 10 |
| 2006 | 6 | - | - | - | 2 | - | 2 | - | - | - | - | 10 |
| 2007 | 6 | - | - | - | 2 | - | 2 | - | - | - | - | 10 |
| 2008 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2009 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2010 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2011 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2012 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2013 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2014 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2015 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2016 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2017 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2018 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2019 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2020 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2021 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2022 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2023 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2024 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2025 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2026 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2027 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2028 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2029 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2030 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2031 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2032 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2033 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2034 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2035 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2036 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2037 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2038 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2039 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2040 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2041 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| 2042 | 6 | - | - | - | 2 | - | 2 | 1 | - | - | - | 11 |
| Average Annual Growth Rates | | | | | | | | | | | | |
| 1983-2012 | 2.4% | -- | -100.0% | -- | -2.4% | -- | 0.0% | -- | -- | -- | -100.0% | 0.2% |
| 1997-2012 | 0.0% | -- | -- | -- | 0.0% | -- | -2.7% | -- | -100.0% | -- | -- | -0.2% |
| 2002-2012 | 0.0% | -- | -100.0% | -- | 0.0% | -- | 0.0% | -- | -100.0% | -- | -- | -0.3% |
| 2007-2012 | 0.0% | -- | -- | -- | 0.0% | -- | 0.0% | -- | -- | -- | -- | 1.9% |
| 2012-2017 | 0.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | -- | -- | -- | 0.0% |
| 2012-2022 | 0.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | -- | -- | -- | 0.0% |
| 2012-2032 | 0.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | -- | -- | -- | 0.0% |
| 2012-2042 | 0.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | -- | -- | -- | 0.0% |
| 2013-2042 | 0.0% | -- | -- | -- | 0.0% | -- | 0.0% | 0.0% | -- | -- | -- | 0.0% |

CIP Reduction Forecast By Member (kWh)

Minnkota Power Cooperative, Inc.

| Year | Cass | | Clearwater- | | | North | PKM | Red | Red | Roseau | Wild | MPC | NMPA | Joint System |
|-----------------------------|-----------|--------|-------------|-----------|-------|-----------|------------|-----------|-----------|-----------|-----------|-------------------|------------|----------------------|
| | Beltrami | County | Cavalier | Polk | Nodak | Star | | Lake | River | | Rice | CIP Req. Forecast | | CIP Req. Forecast /1 |
| 1992 | | | | | | | | | | | | | | |
| 1993 | | | | | | | | | | | | | | |
| 1994 | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | |
| 1999 | | | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | | | |
| 2001 | | | | | | | | | | | | | | |
| 2002 | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | |
| 2009 | 847,661 | - | - | 173,134 | - | - | 821,775 | 228,914 | 222,839 | 172,400 | 250,742 | 2,717,465 | 547,801 | 3,265,266 |
| 2010 | 2,376,309 | - | - | 553,268 | - | 532,270 | 2,278,967 | 893,994 | 779,308 | 1,037,573 | 1,461,068 | 9,912,757 | 1,956,193 | 11,868,950 |
| 2011 | 3,485,044 | - | - | 975,484 | - | 933,771 | 3,301,824 | 1,271,309 | 1,406,865 | 2,675,718 | 2,479,702 | 16,529,717 | 3,940,604 | 20,470,321 |
| 2012 | 4,964,860 | - | - | 1,166,222 | - | 1,200,049 | 4,825,429 | 1,784,228 | 2,187,529 | 3,184,773 | 3,861,965 | 23,175,055 | 6,453,663 | 29,628,718 |
| 2013 | 5,064,157 | - | - | 1,201,209 | - | 1,224,050 | 4,970,192 | 1,837,755 | 1,400,000 | 3,280,316 | 3,977,824 | 22,955,503 | 6,582,736 | 29,538,239 |
| 2014 | 5,165,440 | - | - | 1,237,245 | - | 1,248,531 | 5,119,298 | 1,892,887 | 1,400,000 | 3,378,726 | 4,097,159 | 23,539,286 | 6,714,391 | 30,253,677 |
| 2015 | 5,268,749 | - | - | 1,274,362 | - | 1,273,502 | 5,272,877 | 1,949,674 | 1,400,000 | 3,480,087 | 4,220,073 | 24,139,325 | 6,848,679 | 30,988,003 |
| 2016 | 5,374,124 | - | - | 1,312,593 | - | 1,298,972 | 5,431,063 | 2,008,164 | 1,400,000 | 3,584,490 | 4,346,676 | 24,756,082 | 6,985,652 | 31,741,734 |
| 2017 | 5,481,607 | - | - | 1,351,971 | - | 1,324,951 | 5,593,995 | 2,068,409 | 1,400,000 | 3,692,025 | 4,477,076 | 25,390,033 | 7,125,365 | 32,515,399 |
| 2018 | 5,591,239 | - | - | 1,392,530 | - | 1,351,450 | 5,761,815 | 2,130,462 | 1,400,000 | 3,802,786 | 4,611,388 | 26,041,669 | 7,267,873 | 33,309,541 |
| 2019 | 5,703,064 | - | - | 1,434,306 | - | 1,378,479 | 5,934,669 | 2,194,375 | 1,400,000 | 3,916,869 | 4,749,730 | 26,711,492 | 7,413,230 | 34,124,722 |
| 2020 | 5,817,125 | - | - | 1,477,335 | - | 1,406,049 | 6,112,709 | 2,260,207 | 1,400,000 | 4,034,375 | 4,892,222 | 27,400,021 | 7,561,495 | 34,961,515 |
| 2021 | 5,933,467 | - | - | 1,521,655 | - | 1,434,170 | 6,296,090 | 2,328,013 | 1,400,000 | 4,155,406 | 5,038,988 | 28,107,790 | 7,712,725 | 35,820,515 |
| 2022 | 6,052,137 | - | - | 1,567,305 | - | 1,462,853 | 6,484,973 | 2,397,853 | 1,400,000 | 4,280,069 | 5,190,158 | 28,835,347 | 7,866,979 | 36,702,327 |
| 2023 | 6,173,179 | - | - | 1,614,324 | - | 1,492,110 | 6,679,522 | 2,469,789 | 1,400,000 | 4,408,471 | 5,345,863 | 29,583,258 | 8,024,319 | 37,607,577 |
| 2024 | 6,296,643 | - | - | 1,662,754 | - | 1,521,952 | 6,879,908 | 2,543,882 | 1,400,000 | 4,540,725 | 5,506,239 | 30,352,103 | 8,184,805 | 38,536,908 |
| 2025 | 6,422,576 | - | - | 1,712,636 | - | 1,552,391 | 7,086,305 | 2,620,199 | 1,400,000 | 4,676,947 | 5,671,426 | 31,142,480 | 8,348,501 | 39,490,981 |
| 2026 | 6,551,027 | - | - | 1,764,015 | - | 1,583,439 | 7,298,894 | 2,698,805 | 1,400,000 | 4,817,255 | 5,841,569 | 31,955,005 | 8,515,471 | 40,470,476 |
| 2027 | 6,682,048 | - | - | 1,816,936 | - | 1,615,108 | 7,517,861 | 2,779,769 | 1,400,000 | 4,961,773 | 6,016,816 | 32,790,310 | 8,685,781 | 41,476,091 |
| 2028 | 6,815,689 | - | - | 1,871,444 | - | 1,647,410 | 7,743,397 | 2,863,162 | 1,400,000 | 5,110,626 | 6,197,320 | 33,649,048 | 8,859,496 | 42,508,544 |
| 2029 | 6,952,003 | - | - | 1,927,587 | - | 1,680,358 | 7,975,699 | 2,949,057 | 1,400,000 | 5,263,945 | 6,383,240 | 34,531,888 | 9,036,686 | 43,568,575 |
| 2030 | 7,091,043 | - | - | 1,985,415 | - | 1,713,965 | 8,214,970 | 3,037,529 | 1,400,000 | 5,421,863 | 6,574,737 | 35,439,521 | 9,217,420 | 44,656,941 |
| 2031 | 7,232,864 | - | - | 2,044,977 | - | 1,748,245 | 8,461,419 | 3,128,655 | 1,400,000 | 5,584,519 | 6,771,979 | 36,372,657 | 9,401,768 | 45,774,425 |
| 2032 | 7,377,521 | - | - | 2,106,327 | - | 1,783,210 | 8,715,262 | 3,222,514 | 1,400,000 | 5,752,054 | 6,975,138 | 37,332,026 | 9,589,804 | 46,921,829 |
| 2033 | 7,525,071 | - | - | 2,169,516 | - | 1,818,874 | 8,976,719 | 3,319,190 | 1,400,000 | 5,924,616 | 7,184,393 | 38,318,379 | 9,781,600 | 48,099,979 |
| 2034 | 7,675,573 | - | - | 2,234,602 | - | 1,855,251 | 9,246,021 | 3,418,765 | 1,400,000 | 6,102,354 | 7,399,924 | 39,332,491 | 9,977,232 | 49,309,723 |
| 2035 | 7,829,084 | - | - | 2,301,640 | - | 1,892,356 | 9,523,402 | 3,521,328 | 1,400,000 | 6,285,425 | 7,621,922 | 40,375,157 | 10,176,776 | 50,551,934 |
| 2036 | 7,985,666 | - | - | 2,370,689 | - | 1,930,204 | 9,809,104 | 3,626,968 | 1,400,000 | 6,473,988 | 7,850,580 | 41,447,198 | 10,380,312 | 51,827,510 |
| 2037 | 8,145,379 | - | - | 2,441,810 | - | 1,968,808 | 10,103,377 | 3,735,777 | 1,400,000 | 6,668,207 | 8,086,097 | 42,549,455 | 10,587,918 | 53,137,373 |
| 2038 | 8,308,287 | - | - | 2,515,064 | - | 2,008,184 | 10,406,478 | 3,847,851 | 1,400,000 | 6,868,254 | 8,328,680 | 43,682,797 | 10,799,677 | 54,482,473 |
| 2039 | 8,474,452 | - | - | 2,590,516 | - | 2,048,347 | 10,718,672 | 3,963,286 | 1,400,000 | 7,074,301 | 8,578,540 | 44,848,116 | 11,015,670 | 55,863,786 |
| 2040 | 8,643,941 | - | - | 2,668,232 | - | 2,089,314 | 11,040,233 | 4,082,185 | 1,400,000 | 7,286,530 | 8,835,897 | 46,046,331 | 11,235,984 | 57,282,315 |
| 2041 | 8,816,820 | - | - | 2,748,279 | - | 2,131,101 | 11,371,440 | 4,204,650 | 1,400,000 | 7,505,126 | 9,100,974 | 47,278,389 | 11,460,703 | 58,739,092 |
| 2042 | 8,993,157 | - | - | 2,830,727 | - | 2,173,723 | 11,712,583 | 4,330,790 | 1,400,000 | 7,730,280 | 9,374,003 | 48,545,261 | 11,689,917 | 60,235,179 |
| Average Annual Growth Rates | | | | | | | | | | | | | | |
| 1997-2012 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2002-2012 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2007-2012 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2012-2017 | 2.0% | -- | -- | 3.0% | -- | 2.0% | 3.0% | 3.0% | -8.5% | 3.0% | 3.0% | 1.8% | 2.0% | 1.9% |
| 2012-2022 | 2.0% | -- | -- | 3.0% | -- | 2.0% | 3.0% | 3.0% | -4.4% | 3.0% | 3.0% | 2.2% | 2.0% | 2.2% |
| 2012-2032 | 2.0% | -- | -- | 3.0% | -- | 2.0% | 3.0% | 3.0% | -2.2% | 3.0% | 3.0% | 2.4% | 2.0% | 2.3% |
| 2012-2042 | 2.0% | -- | -- | 3.0% | -- | 2.0% | 3.0% | 3.0% | -1.5% | 3.0% | 3.0% | 2.5% | 2.0% | 2.4% |
| 2013-2042 | 2.0% | -- | -- | 3.0% | -- | 2.0% | 3.0% | 3.0% | 0.0% | 3.0% | 3.0% | 2.6% | 2.0% | 2.5% |

/1 Retail - excludes losses

Member Summaries

Table 3.9

Member Forecasts By Class
Beltrami Electric Cooperative, Inc.

| Year | Residential | Seasonal | Irrigation | General Commercial | Large Commercial | Street Lighting | Resale RUS | Resale Other | Total Members |
|------------------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------|---------------------|----------------------|
| 1983 | 8,663 | 1,549 | - | 501 | 2 | 25 | 1 | 3 | 10,745 |
| 1984 | 8,925 | 1,625 | 9 | 505 | 2 | 25 | 1 | 3 | 11,095 |
| 1985 | 9,111 | 1,676 | 11 | 521 | 2 | 25 | 1 | 3 | 11,350 |
| 1986 | 9,267 | 1,719 | 12 | 531 | 2 | 26 | 1 | 4 | 11,562 |
| 1987 | 9,435 | 1,754 | 13 | 544 | 2 | 28 | 1 | 5 | 11,782 |
| 1988 | 9,688 | 1,788 | 13 | 571 | 2 | 28 | 1 | 5 | 12,097 |
| 1989 | 9,918 | 1,785 | 11 | 604 | 2 | 28 | 1 | 5 | 12,354 |
| 1990 | 10,077 | 1,826 | 18 | 621 | 2 | 28 | 1 | 5 | 12,578 |
| 1991 | 10,283 | 1,880 | 22 | 638 | 2 | 28 | 1 | 6 | 12,860 |
| 1992 | 10,550 | 1,927 | 25 | 657 | 3 | 28 | 1 | 6 | 13,197 |
| 1993 | 10,874 | 1,962 | 26 | 671 | 3 | 28 | 1 | 6 | 13,571 |
| 1994 | 11,214 | 2,002 | 26 | 675 | 4 | 27 | 1 | 6 | 13,955 |
| 1995 | 11,599 | 1,990 | 26 | 697 | 4 | 27 | 1 | 6 | 14,350 |
| 1996 | 11,931 | 2,016 | 26 | 724 | 4 | 27 | 1 | 6 | 14,735 |
| 1997 | 12,256 | 1,995 | 24 | 754 | 4 | 26 | 1 | 6 | 15,066 |
| 1998 | 12,668 | 1,999 | 22 | 791 | 4 | 26 | 1 | 6 | 15,517 |
| 1999 | 13,074 | 1,984 | 27 | 822 | 6 | 26 | 1 | 6 | 15,946 |
| 2000 | 13,491 | 1,943 | 22 | 859 | 6 | 27 | 1 | 6 | 16,354 |
| 2001 | 14,003 | 1,870 | 21 | 896 | 6 | 28 | 1 | 6 | 16,831 |
| 2002 | 14,580 | 1,745 | 20 | 977 | 6 | 27 | 1 | 6 | 17,362 |
| 2003 | 15,140 | 1,618 | 20 | 1,057 | 6 | 28 | 1 | 6 | 17,875 |
| 2004 | 15,749 | 1,463 | 21 | 1,116 | 6 | 27 | 1 | 6 | 18,389 |
| 2005 | 16,162 | 1,373 | 20 | 1,163 | 6 | 29 | 1 | 6 | 18,759 |
| 2006 | 16,717 | 1,201 | 20 | 1,223 | 6 | 39 | 1 | 6 | 19,214 |
| 2007 | 17,208 | 1,001 | 19 | 1,306 | 6 | 42 | 1 | 6 | 19,589 |
| 2008 | 17,587 | 856 | 19 | 1,316 | 6 | 45 | 1 | 6 | 19,835 |
| 2009 | 18,617 | - | 20 | 1,312 | 7 | 50 | 1 | 6 | 20,012 |
| 2010 | 18,781 | - | 18 | 1,324 | 7 | 54 | 1 | 6 | 20,190 |
| 2011 | 18,827 | - | 15 | 1,358 | 7 | 62 | 1 | 6 | 20,275 |
| 2012 | 18,847 | - | 15 | 1,355 | 7 | 66 | 1 | 6 | 20,297 |
| 2013 | 18,897 | - | 15 | 1,366 | 7 | 68 | 1 | 6 | 20,361 |
| 2014 | 18,997 | - | 15 | 1,395 | 7 | 70 | 1 | 6 | 20,491 |
| 2015 | 19,147 | - | 15 | 1,430 | 7 | 72 | 1 | 6 | 20,678 |
| 2016 | 19,347 | - | 15 | 1,457 | 7 | 74 | 1 | 6 | 20,907 |
| 2017 | 19,581 | - | 15 | 1,484 | 7 | 76 | 1 | 6 | 21,170 |
| 2018 | 19,797 | - | 15 | 1,512 | 7 | 78 | 1 | 6 | 21,416 |
| 2019 | 20,000 | - | 15 | 1,541 | 7 | 80 | 1 | 6 | 21,649 |
| 2020 | 20,194 | - | 15 | 1,570 | 8 | 82 | 1 | 6 | 21,876 |
| 2021 | 20,382 | - | 15 | 1,600 | 8 | 84 | 1 | 6 | 22,096 |
| 2022 | 20,554 | - | 15 | 1,630 | 8 | 86 | 1 | 6 | 22,300 |
| 2023 | 20,715 | - | 15 | 1,661 | 8 | 88 | 1 | 6 | 22,494 |
| 2024 | 20,869 | - | 15 | 1,693 | 8 | 90 | 1 | 6 | 22,682 |
| 2025 | 21,016 | - | 15 | 1,725 | 8 | 92 | 1 | 6 | 22,863 |
| 2026 | 21,158 | - | 15 | 1,758 | 8 | 94 | 1 | 6 | 23,040 |
| 2027 | 21,296 | - | 15 | 1,791 | 8 | 96 | 1 | 6 | 23,213 |
| 2028 | 21,429 | - | 15 | 1,825 | 8 | 98 | 1 | 6 | 23,383 |
| 2029 | 21,558 | - | 15 | 1,860 | 8 | 100 | 1 | 6 | 23,548 |
| 2030 | 21,681 | - | 15 | 1,896 | 8 | 102 | 1 | 6 | 23,709 |
| 2031 | 21,802 | - | 15 | 1,932 | 8 | 104 | 1 | 6 | 23,868 |
| 2032 | 21,920 | - | 15 | 1,969 | 8 | 106 | 1 | 6 | 24,024 |
| 2033 | 22,035 | - | 15 | 2,006 | 8 | 108 | 1 | 6 | 24,179 |
| 2034 | 22,149 | - | 15 | 2,045 | 8 | 110 | 1 | 6 | 24,333 |
| 2035 | 22,261 | - | 15 | 2,084 | 8 | 112 | 1 | 6 | 24,486 |
| 2036 | 22,372 | - | 15 | 2,123 | 8 | 114 | 1 | 6 | 24,639 |
| 2037 | 22,486 | - | 15 | 2,164 | 8 | 116 | 1 | 6 | 24,796 |
| 2038 | 22,602 | - | 15 | 2,205 | 8 | 118 | 1 | 6 | 24,955 |
| 2039 | 22,722 | - | 15 | 2,247 | 8 | 120 | 1 | 6 | 25,119 |
| 2040 | 22,845 | - | 15 | 2,290 | 8 | 122 | 1 | 6 | 25,287 |
| 2041 | 22,969 | - | 15 | 2,334 | 8 | 124 | 1 | 6 | 25,457 |
| 2042 | 23,093 | - | 15 | 2,378 | 8 | 126 | 1 | 6 | 25,628 |
| Average Annual Growth Rates | | | | | | | | | |
| 1983-2012 | 2.7% | -100.0% | -- | 3.5% | 4.4% | 3.3% | 0.0% | 2.4% | 2.2% |
| 1997-2012 | 2.9% | -100.0% | -2.5% | 3.7% | 4.3% | 4.4% | 0.0% | 0.0% | 2.2% |
| 2002-2012 | 2.6% | -100.0% | -2.4% | 3.3% | 1.6% | 9.2% | 0.0% | 0.0% | 1.6% |
| 2007-2012 | 1.8% | -100.0% | -4.6% | 0.7% | 3.1% | 9.4% | 0.0% | 0.0% | 0.7% |
| 2012-2017 | 0.8% | -- | 0.0% | 1.8% | 0.0% | 2.9% | 0.0% | 0.0% | 0.8% |
| 2012-2022 | 0.9% | -- | 0.0% | 1.9% | 1.3% | 2.7% | 0.0% | 0.0% | 0.9% |
| 2012-2032 | 0.8% | -- | 0.0% | 1.9% | 0.7% | 2.4% | 0.0% | 0.0% | 0.8% |
| 2012-2042 | 0.7% | -- | 0.0% | 1.9% | 0.4% | 2.2% | 0.0% | 0.0% | 0.8% |

Table 3.10

Energy Forecasts By Class (kWh)
Beltrami Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Resale RUS</u> | <u>Resale Other</u> | <u>Total kWh Sales</u> |
|-------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------|---------------------|------------------------|
| 1983 | 111,944,450 | 2,538,240 | - | 19,171,200 | 2,986,800 | 308,020 | 5,997,600 | 37,661,300 | 180,607,610 |
| 1984 | 121,653,780 | 2,497,130 | 65,310 | 20,649,920 | 2,712,600 | 323,150 | 6,143,400 | 43,665,960 | 197,711,250 |
| 1985 | 126,174,720 | 2,851,730 | 48,570 | 21,506,100 | 2,904,600 | 317,420 | 6,010,200 | 44,466,400 | 204,279,740 |
| 1986 | 130,709,175 | 2,657,380 | 124,090 | 22,071,000 | 2,981,400 | 345,095 | 5,338,800 | 47,196,680 | 211,423,620 |
| 1987 | 129,608,030 | 2,826,560 | 118,430 | 23,380,095 | 2,829,000 | 353,920 | 5,389,200 | 51,853,160 | 216,358,395 |
| 1988 | 139,556,270 | 2,850,070 | 160,060 | 26,242,090 | 3,011,400 | 356,520 | 5,157,000 | 59,027,800 | 236,361,210 |
| 1989 | 148,359,910 | 3,039,310 | 113,870 | 28,033,955 | 3,355,800 | 351,210 | 5,387,400 | 59,472,600 | 248,114,055 |
| 1990 | 150,423,440 | 3,248,680 | 213,140 | 30,011,460 | 3,487,800 | 340,910 | 5,409,600 | 58,605,800 | 251,740,830 |
| 1991 | 159,780,530 | 3,481,750 | 159,740 | 31,775,620 | 3,261,600 | 358,520 | 5,103,000 | 76,123,670 | 280,044,430 |
| 1992 | 162,065,460 | 3,681,220 | 108,830 | 30,917,010 | 4,521,000 | 350,310 | 5,377,657 | 85,570,853 | 292,592,340 |
| 1993 | 175,176,767 | 3,808,990 | 73,565 | 34,866,920 | 6,082,800 | 331,450 | 5,650,555 | 82,462,100 | 308,453,147 |
| 1994 | 180,876,415 | 3,724,835 | 96,545 | 36,072,900 | 7,029,750 | 298,720 | 5,684,380 | 83,059,300 | 316,842,845 |
| 1995 | 191,879,805 | 3,974,610 | 140,030 | 39,078,695 | 7,782,900 | 326,310 | 5,791,798 | 84,538,600 | 333,512,748 |
| 1996 | 210,929,670 | 4,002,960 | 136,440 | 40,813,315 | 8,143,650 | 310,010 | 6,281,174 | 90,692,819 | 361,310,038 |
| 1997 | 214,705,628 | 4,209,640 | 241,080 | 42,351,551 | 7,715,250 | 299,510 | 6,526,134 | 93,960,725 | 370,009,518 |
| 1998 | 203,229,935 | 4,027,550 | 224,420 | 42,946,740 | 7,348,550 | 299,500 | 6,197,288 | 98,149,171 | 362,423,154 |
| 1999 | 219,429,030 | 4,729,406 | 226,932 | 43,179,995 | 9,581,220 | 299,358 | 6,515,407 | 93,412,817 | 377,374,165 |
| 2000 | 233,277,284 | 4,462,753 | 159,587 | 46,476,801 | 10,423,120 | 310,411 | 6,672,212 | 93,005,810 | 394,787,978 |
| 2001 | 246,833,314 | 4,314,968 | 215,890 | 47,506,847 | 11,726,036 | 307,645 | 6,774,788 | 92,349,338 | 410,028,826 |
| 2002 | 269,963,950 | 4,325,097 | 122,653 | 49,418,298 | 13,419,830 | 322,411 | 7,157,112 | 95,339,702 | 440,069,053 |
| 2003 | 268,103,102 | 4,075,262 | 129,751 | 53,055,081 | 12,585,640 | 330,321 | 7,278,572 | 87,024,054 | 432,581,783 |
| 2004 | 272,470,624 | 3,651,591 | 147,250 | 54,684,914 | 11,704,447 | 298,175 | 7,802,182 | 90,802,865 | 441,562,048 |
| 2005 | 277,964,596 | 3,242,456 | 134,206 | 51,952,019 | 15,404,101 | 338,451 | 7,696,019 | 88,859,104 | 445,590,952 |
| 2006 | 281,355,357 | 2,574,104 | 155,990 | 52,994,114 | 15,929,396 | 399,109 | 7,618,370 | 98,405,216 | 459,431,656 |
| 2007 | 293,178,775 | 1,962,647 | 211,904 | 53,223,330 | 17,076,414 | 370,107 | 8,011,705 | 99,726,500 | 463,761,382 |
| 2008 | 313,520,521 | 1,839,877 | 154,677 | 56,994,191 | 17,445,989 | 377,569 | 7,989,728 | 84,218,214 | 482,540,766 |
| 2009 | 317,963,915 | - | 77,688 | 56,577,055 | 17,479,366 | 365,902 | 8,118,785 | 71,121,684 | 471,704,395 |
| 2010 | 299,478,056 | - | 55,787 | 56,803,399 | 18,877,069 | 353,816 | 7,860,022 | 66,212,552 | 449,640,701 |
| 2011 | 304,557,766 | - | 50,715 | 58,711,345 | 18,697,098 | 376,028 | 7,930,660 | 54,116,354 | 444,439,966 |
| 2012 | 282,953,791 | - | 92,109 | 57,716,771 | 18,125,898 | 423,902 | 7,068,507 | 55,907,534 | 422,288,512 |
| 2013 | 288,585,971 | - | 75,249 | 58,805,429 | 18,125,898 | 434,629 | 7,068,507 | 55,627,996 | 428,723,679 |
| 2014 | 289,773,174 | - | 75,249 | 60,049,087 | 18,125,898 | 445,237 | 7,068,507 | 55,349,856 | 430,887,008 |
| 2015 | 293,175,435 | - | 75,249 | 61,531,085 | 18,125,898 | 455,729 | 7,068,507 | 55,073,107 | 435,505,011 |
| 2016 | 295,991,684 | - | 75,249 | 62,692,861 | 18,125,898 | 466,105 | 7,068,507 | 54,797,742 | 439,218,046 |
| 2017 | 301,212,080 | - | 75,249 | 63,877,840 | 18,125,898 | 476,366 | 7,068,507 | 54,523,753 | 445,359,693 |
| 2018 | 306,391,145 | - | 75,249 | 65,086,297 | 18,125,898 | 486,512 | 7,068,507 | 54,251,134 | 451,484,743 |
| 2019 | 311,211,063 | - | 75,249 | 66,318,873 | 18,125,898 | 496,545 | 7,068,507 | 53,979,878 | 457,276,014 |
| 2020 | 316,165,807 | - | 75,249 | 67,575,853 | 20,125,898 | 506,466 | 7,068,507 | 53,709,979 | 465,227,759 |
| 2021 | 323,136,460 | - | 75,249 | 68,857,807 | 20,125,898 | 516,275 | 7,068,507 | 53,441,429 | 473,221,625 |
| 2022 | 330,282,587 | - | 75,249 | 70,165,034 | 20,125,898 | 525,973 | 7,068,507 | 53,174,222 | 481,417,469 |
| 2023 | 338,241,904 | - | 75,249 | 71,497,931 | 20,125,898 | 535,561 | 7,068,507 | 52,908,351 | 490,453,401 |
| 2024 | 345,562,609 | - | 75,249 | 72,856,959 | 20,125,898 | 545,040 | 7,068,507 | 52,643,809 | 498,878,072 |
| 2025 | 352,224,198 | - | 75,249 | 74,242,565 | 20,125,898 | 554,411 | 7,068,507 | 52,380,590 | 506,671,419 |
| 2026 | 357,434,179 | - | 75,249 | 75,655,344 | 20,125,898 | 563,675 | 7,068,507 | 52,118,687 | 513,041,540 |
| 2027 | 361,456,681 | - | 75,249 | 77,095,584 | 20,125,898 | 572,832 | 7,068,507 | 51,858,094 | 518,252,845 |
| 2028 | 364,791,328 | - | 75,249 | 78,563,964 | 20,125,898 | 581,884 | 7,068,507 | 51,598,803 | 522,805,633 |
| 2029 | 367,975,885 | - | 75,249 | 80,060,781 | 20,125,898 | 590,830 | 7,068,507 | 51,340,809 | 527,237,959 |
| 2030 | 371,687,574 | - | 75,249 | 81,586,783 | 20,125,898 | 599,673 | 7,068,507 | 51,084,105 | 532,227,790 |
| 2031 | 374,671,314 | - | 75,249 | 83,142,316 | 20,125,898 | 608,413 | 7,068,507 | 50,828,685 | 536,520,381 |
| 2032 | 377,824,151 | - | 75,249 | 84,727,936 | 20,125,898 | 617,050 | 7,068,507 | 50,574,541 | 541,013,332 |
| 2033 | 381,440,953 | - | 75,249 | 86,344,063 | 20,125,898 | 625,585 | 7,068,507 | 50,321,668 | 546,001,924 |
| 2034 | 384,315,141 | - | 75,249 | 87,991,236 | 20,125,898 | 634,020 | 7,068,507 | 50,070,060 | 550,280,112 |
| 2035 | 387,304,270 | - | 75,249 | 89,670,109 | 20,125,898 | 642,355 | 7,068,507 | 49,819,710 | 554,706,097 |
| 2036 | 390,964,767 | - | 75,249 | 91,381,282 | 20,125,898 | 650,590 | 7,068,507 | 49,570,611 | 559,836,905 |
| 2037 | 393,832,334 | - | 75,249 | 93,125,217 | 20,125,898 | 658,727 | 7,068,507 | 49,322,758 | 564,208,692 |
| 2038 | 396,749,188 | - | 75,249 | 94,902,482 | 20,125,898 | 666,767 | 7,068,507 | 49,076,144 | 568,664,235 |
| 2039 | 400,719,406 | - | 75,249 | 96,713,629 | 20,125,898 | 674,710 | 7,068,507 | 48,830,764 | 574,208,162 |
| 2040 | 403,738,057 | - | 75,249 | 98,559,390 | 20,125,898 | 682,556 | 7,068,507 | 48,586,610 | 578,836,267 |
| 2041 | 406,766,691 | - | 75,249 | 100,442,152 | 20,125,898 | 690,307 | 7,068,507 | 48,343,677 | 583,512,481 |
| 2042 | 409,805,120 | - | 75,249 | 102,364,430 | 20,125,898 | 697,964 | 7,068,507 | 48,101,958 | 588,239,127 |

| Average Annual Growth Rates | | | | | | | | | |
|-----------------------------|-------|---------|--------|------|------|------|-------|-------|-------|
| 1983-2012 | 3.2% | -100.0% | -- | 3.9% | 6.4% | 1.1% | 0.6% | 1.4% | 3.0% |
| 1997-2012 | 2.8% | -100.0% | -0.8% | 3.2% | 7.2% | 1.0% | 1.4% | -2.1% | 1.9% |
| 2002-2012 | 0.5% | -100.0% | -2.8% | 1.6% | 3.1% | 2.8% | -0.1% | -5.2% | -0.4% |
| 2007-2012 | -0.7% | -100.0% | -15.3% | 1.6% | 1.2% | 2.8% | -2.5% | -9.0% | -1.9% |
| 2012-2017 | 1.3% | -- | -4.0% | 2.0% | 0.0% | 2.4% | 0.0% | -0.5% | 1.1% |
| 2012-2022 | 1.6% | -- | -2.0% | 2.0% | 1.1% | 2.2% | 0.0% | -0.5% | 1.3% |
| 2012-2032 | 1.5% | -- | -1.0% | 1.9% | 0.5% | 1.9% | 0.0% | -0.5% | 1.2% |
| 2012-2042 | 1.2% | -- | -0.7% | 1.9% | 0.3% | 1.7% | 0.0% | -0.5% | 1.1% |

Table 3.11

Energy Requirements Forecast (kWh)
Beltrami Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison |
|-----------------------------|-------------|------------|------------|-------------|----------------|
| | Members | and Losses | and Losses | Energy | 2011 |
| | kWh | kWh /1 | % /1 | kWh | Forecast |
| | | | | | kWh |
| 1983 | 180,607,610 | 12,294,090 | 6.4% | 192,901,700 | |
| 1984 | 197,711,250 | 11,406,510 | 5.5% | 209,117,760 | |
| 1985 | 204,279,740 | 13,727,660 | 6.3% | 218,007,400 | |
| 1986 | 211,423,620 | 7,631,060 | 3.5% | 219,054,680 | |
| 1987 | 216,358,395 | 8,276,165 | 3.7% | 224,634,560 | |
| 1988 | 236,361,210 | 13,019,590 | 5.2% | 249,380,800 | |
| 1989 | 248,114,055 | 17,472,345 | 6.6% | 265,586,400 | |
| 1990 | 251,740,830 | 9,466,970 | 3.6% | 261,207,800 | |
| 1991 | 280,044,430 | 14,821,840 | 5.0% | 294,866,270 | |
| 1992 | 292,592,340 | 13,421,064 | 4.4% | 306,013,404 | |
| 1993 | 308,453,147 | 13,608,768 | 4.2% | 322,061,915 | |
| 1994 | 316,842,845 | 16,692,863 | 5.0% | 333,535,708 | |
| 1995 | 333,512,748 | 19,447,830 | 5.5% | 352,960,578 | |
| 1996 | 361,310,038 | 17,199,690 | 4.5% | 378,509,728 | |
| 1997 | 370,009,518 | 14,737,499 | 3.8% | 384,747,017 | |
| 1998 | 362,423,154 | 15,208,517 | 4.0% | 377,631,671 | |
| 1999 | 377,374,165 | 17,909,075 | 4.5% | 395,283,240 | |
| 2000 | 394,787,978 | 16,781,332 | 4.1% | 411,569,310 | |
| 2001 | 410,028,826 | 17,208,351 | 4.0% | 427,237,177 | |
| 2002 | 440,069,053 | 18,851,220 | 4.1% | 458,920,273 | |
| 2003 | 432,581,783 | 21,260,295 | 4.7% | 453,842,078 | |
| 2004 | 441,562,048 | 23,065,771 | 5.0% | 464,627,819 | |
| 2005 | 445,590,952 | 24,046,521 | 5.1% | 469,637,473 | |
| 2006 | 459,431,656 | 24,771,401 | 5.1% | 484,203,057 | |
| 2007 | 463,761,382 | 27,296,686 | 5.6% | 491,058,068 | |
| 2008 | 482,540,766 | 28,540,670 | 5.6% | 511,081,436 | |
| 2009 | 471,704,395 | 26,077,787 | 5.2% | 497,782,182 | |
| 2010 | 449,640,701 | 24,091,203 | 5.1% | 473,731,904 | |
| 2011 | 444,439,966 | 24,796,319 | 5.3% | 469,236,285 | 495,469,896 |
| 2012 | 422,288,512 | 22,714,492 | 5.1% | 445,003,004 | 504,910,827 |
| 2013 | 428,723,679 | 22,564,404 | 5.0% | 451,288,083 | 513,754,410 |
| 2014 | 430,887,008 | 22,678,264 | 5.0% | 453,565,272 | 522,189,796 |
| 2015 | 435,505,011 | 22,921,316 | 5.0% | 458,426,328 | 531,595,811 |
| 2016 | 439,218,046 | 23,116,739 | 5.0% | 462,334,786 | 540,515,098 |
| 2017 | 445,359,693 | 23,439,984 | 5.0% | 468,799,677 | 549,423,593 |
| 2018 | 451,484,743 | 23,762,355 | 5.0% | 475,247,098 | 558,326,765 |
| 2019 | 457,276,014 | 24,067,159 | 5.0% | 481,343,173 | 567,501,245 |
| 2020 | 465,227,759 | 24,485,672 | 5.0% | 489,713,431 | 579,072,840 |
| 2021 | 473,221,625 | 24,906,401 | 5.0% | 498,128,027 | 590,622,191 |
| 2022 | 481,417,469 | 25,337,762 | 5.0% | 506,755,231 | 600,509,942 |
| 2023 | 490,453,401 | 25,813,337 | 5.0% | 516,266,738 | 612,264,954 |
| 2024 | 498,878,072 | 26,256,741 | 5.0% | 525,134,813 | 622,231,906 |
| 2025 | 506,674,419 | 26,666,917 | 5.0% | 533,338,336 | 634,083,554 |
| 2026 | 513,041,540 | 27,002,186 | 5.0% | 540,043,726 | 644,110,601 |
| 2027 | 518,252,845 | 27,276,466 | 5.0% | 545,529,310 | 656,176,626 |
| 2028 | 522,805,633 | 27,516,086 | 5.0% | 550,321,719 | 666,167,604 |
| 2029 | 527,237,959 | 27,749,366 | 5.0% | 554,987,326 | 679,394,915 |
| 2030 | 532,227,790 | 28,011,989 | 5.0% | 560,239,779 | 692,373,141 |
| 2031 | 536,520,381 | 28,237,915 | 5.0% | 564,758,296 | 701,928,916 |
| 2032 | 541,013,332 | 28,474,386 | 5.0% | 569,487,718 | 715,492,293 |
| 2033 | 546,001,924 | 28,736,943 | 5.0% | 574,738,867 | 729,179,041 |
| 2034 | 550,280,112 | 28,962,111 | 5.0% | 579,242,223 | 742,568,184 |
| 2035 | 554,706,097 | 29,195,058 | 5.0% | 583,901,155 | 756,503,580 |
| 2036 | 559,836,905 | 29,465,100 | 5.0% | 589,302,005 | 769,759,411 |
| 2037 | 564,208,692 | 29,695,194 | 5.0% | 593,903,886 | 783,915,426 |
| 2038 | 568,664,235 | 29,929,697 | 5.0% | 598,593,932 | 798,127,196 |
| 2039 | 574,208,162 | 30,221,482 | 5.0% | 604,429,644 | 813,206,235 |
| 2040 | 578,836,267 | 30,465,067 | 5.0% | 609,301,334 | 827,609,243 |
| 2041 | 583,512,481 | 30,711,183 | 5.0% | 614,223,665 | |
| 2042 | 588,239,127 | 30,959,954 | 5.0% | 619,199,081 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 3.0% | 2.1% | | 2.9% | -- |
| 1997-2012 | 1.9% | 2.7% | | 1.9% | -- |
| 2002-2012 | -0.4% | 1.9% | | -0.3% | -- |
| 2007-2012 | -1.9% | -3.6% | | -2.0% | -- |
| 2012-2017 | 1.1% | 0.6% | | 1.0% | 1.7% |
| 2012-2022 | 1.3% | 1.1% | | 1.3% | 1.7% |
| 2012-2032 | 1.2% | 1.1% | | 1.2% | 1.8% |
| 2012-2042 | 1.1% | 1.0% | | 1.1% | |

/1 Distribution losses

Table 3.12

Member Forecasts By Class
Cass County Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Irrigation</u> | <u>Small Commercial</u> | <u>Lg. & Int. Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Extra Lg. Power</u> | <u>Total Members</u> |
|-----------------------------|--------------------|-------------------|-------------------------|----------------------------------|------------------------|-------------------------|------------------------|----------------------|
| 1983 | 8,840 | 141 | 1,120 | 9 | 54 | 11 | - | 10,175 |
| 1984 | 8,945 | 145 | 1,150 | 9 | 56 | 11 | - | 10,317 |
| 1985 | 9,240 | 149 | 1,176 | 9 | 57 | 11 | - | 10,642 |
| 1986 | 9,774 | 150 | 1,187 | 9 | 65 | 11 | - | 11,195 |
| 1987 | 9,989 | 149 | 1,204 | 9 | 70 | 11 | - | 11,432 |
| 1988 | 10,207 | 151 | 1,211 | 10 | 71 | 11 | - | 11,661 |
| 1989 | 10,782 | 152 | 1,234 | 10 | 90 | 11 | - | 12,279 |
| 1990 | 11,289 | 154 | 1,251 | 10 | 99 | 11 | - | 12,815 |
| 1991 | 11,761 | 156 | 1,355 | 10 | 115 | 11 | - | 13,408 |
| 1992 | 12,557 | 164 | 1,421 | 10 | 128 | 11 | - | 14,291 |
| 1993 | 13,359 | 169 | 1,496 | 10 | 139 | 11 | - | 15,183 |
| 1994 | 14,147 | 172 | 1,523 | 11 | 153 | 11 | - | 16,017 |
| 1995 | 14,881 | 173 | 1,568 | 11 | 164 | 11 | - | 16,809 |
| 1996 | 15,872 | 178 | 1,592 | 40 | 173 | 11 | - | 17,866 |
| 1997 | 16,144 | 185 | 1,627 | 41 | 188 | 11 | - | 18,195 |
| 1998 | 16,830 | 190 | 1,712 | 43 | 199 | 11 | - | 18,985 |
| 1999 | 17,592 | 191 | 1,798 | 50 | 205 | 11 | - | 19,846 |
| 2000 | 18,342 | 188 | 1,834 | 53 | 224 | 5 | - | 20,645 |
| 2001 | 19,242 | 184 | 1,931 | 61 | 242 | - | - | 21,660 |
| 2002 | 20,418 | 188 | 2,009 | 63 | 252 | - | - | 22,930 |
| 2003 | 21,723 | 190 | 2,336 | 65 | 242 | - | - | 24,557 |
| 2004 | 23,261 | 190 | 2,487 | 71 | 271 | - | - | 26,281 |
| 2005 | 25,144 | 188 | 2,652 | 73 | 304 | - | - | 28,361 |
| 2006 | 26,838 | 187 | 2,869 | 80 | 315 | - | - | 30,288 |
| 2007 | 28,117 | 187 | 2,946 | 87 | 374 | - | - | 31,711 |
| 2008 | 29,124 | 188 | 3,153 | 90 | 392 | - | - | 32,946 |
| 2009 | 29,920 | 189 | 3,307 | 97 | 409 | - | - | 33,922 |
| 2010 | 30,611 | 190 | 3,478 | 99 | 420 | - | 1 | 34,799 |
| 2011 | 31,405 | 187 | 3,601 | 105 | 433 | - | 1 | 35,731 |
| 2012 | 32,632 | 190 | 3,765 | 107 | 444 | - | 1 | 37,138 |
| 2013 | 34,017 | 190 | 3,889 | 110 | 453 | - | 1 | 38,659 |
| 2014 | 35,402 | 190 | 4,014 | 114 | 462 | - | 1 | 40,183 |
| 2015 | 36,787 | 190 | 4,140 | 118 | 471 | - | 1 | 41,706 |
| 2016 | 38,137 | 190 | 4,266 | 122 | 480 | - | 1 | 43,196 |
| 2017 | 39,452 | 190 | 4,391 | 126 | 490 | - | 1 | 44,650 |
| 2018 | 40,732 | 190 | 4,515 | 130 | 500 | - | 1 | 46,068 |
| 2019 | 41,977 | 190 | 4,638 | 133 | 510 | - | 1 | 47,449 |
| 2020 | 43,187 | 190 | 4,759 | 137 | 520 | - | 1 | 48,794 |
| 2021 | 44,362 | 190 | 4,879 | 140 | 530 | - | 1 | 50,101 |
| 2022 | 45,502 | 190 | 4,996 | 144 | 541 | - | 1 | 51,374 |
| 2023 | 46,607 | 190 | 5,112 | 147 | 552 | - | 1 | 52,609 |
| 2024 | 47,677 | 190 | 5,226 | 151 | 563 | - | 1 | 53,808 |
| 2025 | 48,712 | 190 | 5,339 | 154 | 574 | - | 1 | 54,969 |
| 2026 | 49,712 | 190 | 5,449 | 157 | 585 | - | 1 | 56,094 |
| 2027 | 50,677 | 190 | 5,558 | 160 | 597 | - | 1 | 57,183 |
| 2028 | 51,607 | 190 | 5,665 | 164 | 609 | - | 1 | 58,235 |
| 2029 | 52,502 | 190 | 5,770 | 166 | 621 | - | 1 | 59,250 |
| 2030 | 53,362 | 190 | 5,874 | 170 | 633 | - | 1 | 60,229 |
| 2031 | 54,187 | 190 | 5,975 | 172 | 646 | - | 1 | 61,171 |
| 2032 | 54,977 | 190 | 6,075 | 176 | 659 | - | 1 | 62,077 |
| 2033 | 55,732 | 190 | 6,173 | 178 | 672 | - | 1 | 62,945 |
| 2034 | 56,452 | 190 | 6,269 | 181 | 685 | - | 1 | 63,778 |
| 2035 | 57,137 | 190 | 6,363 | 184 | 699 | - | 1 | 64,573 |
| 2036 | 57,787 | 190 | 6,455 | 187 | 713 | - | 1 | 65,333 |
| 2037 | 58,427 | 190 | 6,546 | 189 | 727 | - | 1 | 66,080 |
| 2038 | 59,057 | 190 | 6,635 | 192 | 742 | - | 1 | 66,817 |
| 2039 | 59,677 | 190 | 6,722 | 194 | 757 | - | 1 | 67,541 |
| 2040 | 60,287 | 190 | 6,807 | 198 | 772 | - | 1 | 68,254 |
| 2041 | 60,887 | 190 | 6,890 | 200 | 787 | - | 1 | 68,954 |
| 2042 | 61,477 | 190 | 6,971 | 203 | 803 | - | 1 | 69,644 |
| Average Annual Growth Rates | | | | | | | | |
| 1983-2012 | 4.6% | 1.0% | 4.3% | 8.9% | 7.5% | -100.0% | -- | 4.6% |
| 1997-2012 | 4.9% | 0.7% | 5.0% | 12.6% | 6.4% | -100.0% | -- | 4.9% |
| 2002-2012 | 4.8% | 0.1% | 6.5% | 5.4% | 5.9% | -- | -- | 4.9% |
| 2007-2012 | 3.0% | 0.3% | 5.0% | 4.2% | 3.5% | -- | -- | 3.2% |
| 2012-2017 | 3.9% | 0.0% | 3.1% | 3.3% | 2.0% | -- | 0.0% | 3.8% |
| 2012-2022 | 3.4% | 0.0% | 2.9% | 3.0% | 2.0% | -- | 0.0% | 3.3% |
| 2012-2032 | 2.6% | 0.0% | 2.4% | 2.5% | 2.0% | -- | 0.0% | 2.6% |
| 2012-2042 | 2.1% | 0.0% | 2.1% | 2.2% | 2.0% | -- | 0.0% | 2.1% |

Table 3.13

Energy Forecasts By Class (kWh)
Cass County Electric Cooperative, Inc.

| Year | Residential | Irrigation | Small Commercial | Lg. & Int. Commercial | Street Lighting | Public Authority | Extra Lg. Power | Total kWh Sales |
|-----------------------------|-------------|------------|------------------|-----------------------|-----------------|------------------|-----------------|-----------------|
| 1983 | 196,667,910 | 5,947,180 | 66,197,788 | 26,758,458 | 741,852 | 3,732,320 | - | 300,045,508 |
| 1984 | 200,687,289 | 7,693,120 | 71,418,834 | 28,492,250 | 765,934 | 3,237,920 | - | 312,295,347 |
| 1985 | 207,581,544 | 6,493,060 | 77,895,313 | 27,913,770 | 795,229 | 2,054,840 | - | 322,733,756 |
| 1986 | 205,775,061 | 4,326,130 | 77,804,129 | 26,579,930 | 893,083 | 1,927,040 | - | 317,305,373 |
| 1987 | 192,513,419 | 6,891,160 | 78,966,004 | 29,628,970 | 1,021,943 | 1,830,240 | - | 310,851,736 |
| 1988 | 216,098,418 | 10,230,270 | 86,576,281 | 33,886,300 | 1,055,414 | 1,804,320 | - | 349,651,003 |
| 1989 | 226,923,803 | 6,648,685 | 88,258,180 | 34,397,250 | 1,164,050 | 1,835,200 | - | 359,227,168 |
| 1990 | 222,946,761 | 6,807,630 | 89,247,107 | 34,369,800 | 1,279,296 | 1,894,240 | - | 356,544,834 |
| 1991 | 242,114,483 | 6,575,140 | 95,562,801 | 32,803,750 | 1,412,944 | 1,893,280 | - | 380,362,398 |
| 1992 | 238,019,667 | 4,068,090 | 98,197,645 | 31,947,950 | 1,550,701 | 1,876,480 | - | 375,660,533 |
| 1993 | 270,436,686 | 2,414,920 | 103,820,338 | 34,694,450 | 1,639,462 | 1,842,560 | - | 414,848,416 |
| 1994 | 281,273,158 | 5,136,330 | 115,874,468 | 38,400,200 | 1,848,538 | 1,834,560 | - | 444,367,254 |
| 1995 | 307,081,439 | 5,323,180 | 131,899,332 | 36,037,100 | 2,044,756 | 1,844,160 | - | 484,229,967 |
| 1996 | 341,683,058 | 5,800,140 | 122,133,309 | 66,455,640 | 2,185,432 | 1,888,320 | - | 540,145,899 |
| 1997 | 324,423,212 | 4,209,490 | 122,065,044 | 67,706,570 | 2,317,150 | 1,648,800 | - | 522,370,266 |
| 1998 | 313,373,900 | 4,904,050 | 129,354,712 | 72,930,680 | 2,460,853 | 1,628,480 | - | 524,652,675 |
| 1999 | 329,493,778 | 3,925,130 | 140,074,566 | 75,630,670 | 2,641,367 | 833,120 | - | 552,598,631 |
| 2000 | 346,448,286 | 4,067,471 | 141,664,855 | 96,177,630 | 2,985,543 | 95,520 | - | 591,439,305 |
| 2001 | 361,009,987 | 4,633,124 | 141,186,649 | 117,021,580 | 3,480,129 | - | - | 627,331,469 |
| 2002 | 389,995,663 | 5,040,469 | 152,278,280 | 133,044,320 | 3,734,246 | - | - | 684,092,978 |
| 2003 | 394,224,253 | 6,222,962 | 148,238,987 | 144,860,906 | 4,105,246 | - | - | 697,652,354 |
| 2004 | 396,568,889 | 4,901,283 | 150,253,555 | 154,248,473 | 4,612,721 | - | - | 710,584,921 |
| 2005 | 430,137,616 | 2,899,607 | 158,791,175 | 166,933,614 | 5,185,918 | - | - | 763,947,930 |
| 2006 | 444,808,930 | 7,509,148 | 163,060,533 | 185,679,644 | 5,459,405 | - | - | 806,517,660 |
| 2007 | 477,617,649 | 5,236,714 | 174,706,738 | 201,647,535 | 5,833,831 | - | - | 865,042,467 |
| 2008 | 516,393,590 | 6,041,823 | 192,837,991 | 215,394,660 | 6,150,564 | - | - | 936,818,628 |
| 2009 | 537,042,689 | 4,644,137 | 203,056,968 | 217,180,625 | 6,645,036 | - | - | 968,569,455 |
| 2010 | 506,755,417 | 3,130,161 | 200,859,437 | 227,064,696 | 7,261,202 | - | 4,057,693 | 949,128,606 |
| 2011 | 525,219,255 | 1,928,980 | 196,119,712 | 242,133,659 | 7,833,707 | - | 47,252,436 | 1,020,487,749 |
| 2012 | 486,313,647 | 6,603,145 | 194,905,894 | 241,128,125 | 8,171,330 | - | 66,477,065 | 1,003,599,206 |
| 2013 | 546,480,498 | 4,491,968 | 218,209,647 | 250,072,968 | 8,311,644 | - | 67,500,000 | 1,095,066,725 |
| 2014 | 559,542,737 | 4,491,968 | 224,734,332 | 267,053,233 | 8,455,524 | - | 67,750,000 | 1,132,027,794 |
| 2015 | 571,532,569 | 4,491,968 | 232,595,557 | 274,901,179 | 8,598,576 | - | 68,000,000 | 1,160,119,849 |
| 2016 | 585,877,981 | 4,491,968 | 240,133,048 | 289,679,647 | 8,740,800 | - | 68,000,000 | 1,196,923,445 |
| 2017 | 600,710,834 | 4,491,968 | 247,669,992 | 310,588,412 | 8,900,360 | - | 68,000,000 | 1,240,361,566 |
| 2018 | 617,126,471 | 4,491,968 | 255,333,456 | 335,427,246 | 9,059,500 | - | 68,000,000 | 1,289,438,641 |
| 2019 | 629,609,808 | 4,491,968 | 262,750,242 | 341,195,924 | 9,217,740 | - | 68,000,000 | 1,315,265,682 |
| 2020 | 646,206,451 | 4,491,968 | 270,412,064 | 350,894,217 | 9,375,080 | - | 68,000,000 | 1,349,379,781 |
| 2021 | 660,967,978 | 4,491,968 | 279,336,126 | 356,521,900 | 9,531,520 | - | 68,000,000 | 1,378,849,492 |
| 2022 | 675,086,448 | 4,491,968 | 289,090,453 | 366,078,742 | 9,704,999 | - | 68,000,000 | 1,412,452,611 |
| 2023 | 689,226,132 | 4,491,968 | 299,158,517 | 371,564,517 | 9,877,488 | - | 68,000,000 | 1,442,318,623 |
| 2024 | 702,843,287 | 4,491,968 | 308,424,488 | 380,978,996 | 10,048,987 | - | 68,000,000 | 1,474,787,725 |
| 2025 | 715,890,557 | 4,491,968 | 317,657,193 | 386,321,948 | 10,219,496 | - | 68,000,000 | 1,502,581,162 |
| 2026 | 728,125,007 | 4,491,968 | 325,713,456 | 395,593,143 | 10,389,015 | - | 68,000,000 | 1,532,312,590 |
| 2027 | 740,249,208 | 4,491,968 | 333,034,035 | 400,792,353 | 10,575,855 | - | 68,000,000 | 1,557,143,419 |
| 2028 | 752,056,898 | 4,491,968 | 339,916,199 | 409,919,346 | 10,761,639 | - | 68,000,000 | 1,585,146,051 |
| 2029 | 763,535,128 | 4,491,968 | 347,029,226 | 414,973,890 | 10,946,367 | - | 68,000,000 | 1,608,976,579 |
| 2030 | 774,705,315 | 4,491,968 | 354,062,240 | 423,955,755 | 11,130,039 | - | 68,000,000 | 1,636,345,317 |
| 2031 | 785,554,468 | 4,491,968 | 361,011,068 | 428,864,707 | 11,330,194 | - | 68,000,000 | 1,659,252,406 |
| 2032 | 796,094,005 | 4,491,968 | 367,877,162 | 437,700,515 | 11,529,205 | - | 68,000,000 | 1,685,692,856 |
| 2033 | 806,339,619 | 4,491,968 | 374,660,438 | 442,462,946 | 11,727,072 | - | 68,000,000 | 1,707,682,043 |
| 2034 | 816,276,963 | 4,491,968 | 381,361,010 | 451,151,765 | 11,923,795 | - | 68,000,000 | 1,733,205,502 |
| 2035 | 825,906,472 | 4,491,968 | 387,978,739 | 455,766,740 | 12,136,737 | - | 68,000,000 | 1,754,280,657 |
| 2036 | 835,226,756 | 4,491,968 | 394,506,729 | 464,307,635 | 12,349,160 | - | 68,000,000 | 1,778,882,249 |
| 2037 | 844,359,607 | 4,491,968 | 400,945,130 | 468,774,216 | 12,560,379 | - | 68,000,000 | 1,799,131,300 |
| 2038 | 853,305,452 | 4,491,968 | 407,286,570 | 477,166,247 | 12,787,628 | - | 68,000,000 | 1,823,037,865 |
| 2039 | 862,064,936 | 4,491,968 | 413,533,706 | 481,483,493 | 13,013,587 | - | 68,000,000 | 1,842,587,690 |
| 2040 | 870,638,508 | 4,491,968 | 419,679,296 | 489,725,717 | 13,238,256 | - | 68,000,000 | 1,865,773,745 |
| 2041 | 879,026,749 | 4,491,968 | 425,721,640 | 493,892,683 | 13,461,635 | - | 68,000,000 | 1,884,594,675 |
| 2042 | 887,230,196 | 4,491,968 | 431,659,539 | 501,984,153 | 13,700,786 | - | 68,000,000 | 1,907,066,643 |
| Average Annual Growth Rates | | | | | | | | |
| 1983-2012 | 3.2% | 0.4% | 3.8% | 7.9% | 8.6% | -100.0% | -- | 4.3% |
| 1997-2012 | 3.6% | 2.5% | 3.5% | 10.6% | 8.7% | -100.0% | -- | 5.0% |
| 2002-2012 | 2.2% | 2.7% | 2.5% | 6.1% | 8.1% | -- | -- | 3.9% |
| 2007-2012 | 0.4% | 4.7% | 2.2% | 3.6% | 7.0% | -- | -- | 3.0% |
| 2012-2017 | 4.3% | -7.4% | 4.9% | 5.2% | 1.7% | -- | 0.5% | 4.3% |
| 2012-2022 | 3.3% | -3.8% | 4.0% | 4.3% | 1.7% | -- | 0.2% | 3.5% |
| 2012-2032 | 2.5% | -1.9% | 3.2% | 3.0% | 1.7% | -- | 0.1% | 2.6% |
| 2012-2042 | 2.0% | -1.3% | 2.7% | 2.5% | 1.7% | -- | 0.1% | 2.2% |

Table 3.14

Energy Requirements Forecast (kWh)
Cass County Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|----------------|----------------------|-------------------|---------------|---|
| | Members kWh | and Losses kWh /1 | and Losses %/1 | Energy kWh | |
| 1983 | 300,045,508 | 12,888,572 | 4.1% | 312,934,080 | |
| 1984 | 312,295,347 | 4,415,453 | 1.4% | 316,710,800 | |
| 1985 | 322,733,756 | 14,298,244 | 4.2% | 337,032,000 | |
| 1986 | 317,305,373 | 14,640,427 | 4.4% | 331,945,800 | |
| 1987 | 310,851,736 | 16,675,664 | 5.1% | 327,527,400 | |
| 1988 | 349,651,003 | 13,944,197 | 3.8% | 363,595,200 | |
| 1989 | 359,227,168 | 22,099,832 | 5.8% | 381,327,000 | |
| 1990 | 356,544,834 | 10,217,766 | 2.8% | 366,762,600 | |
| 1991 | 380,362,398 | 19,245,781 | 4.8% | 399,608,179 | |
| 1992 | 375,660,533 | 15,851,490 | 4.0% | 391,512,023 | |
| 1993 | 414,848,416 | 17,081,901 | 4.0% | 431,930,317 | |
| 1994 | 444,367,254 | 20,171,320 | 4.3% | 464,538,574 | |
| 1995 | 484,229,967 | 18,241,058 | 3.6% | 502,471,025 | |
| 1996 | 540,145,899 | 10,754,999 | 2.0% | 550,900,898 | |
| 1997 | 522,370,266 | 30,659,991 | 5.5% | 553,030,257 | |
| 1998 | 524,652,675 | 13,274,295 | 2.5% | 537,926,970 | |
| 1999 | 552,598,631 | 20,213,804 | 3.5% | 572,812,435 | |
| 2000 | 591,439,305 | 18,785,849 | 3.1% | 610,225,154 | |
| 2001 | 627,331,469 | 26,704,288 | 4.1% | 654,035,757 | |
| 2002 | 684,092,978 | 23,854,253 | 3.4% | 707,947,231 | |
| 2003 | 697,652,354 | 20,864,442 | 2.9% | 718,516,796 | |
| 2004 | 710,584,921 | 30,921,625 | 4.2% | 741,506,546 | |
| 2005 | 763,947,930 | 31,054,491 | 3.9% | 795,002,421 | |
| 2006 | 806,517,660 | 29,941,248 | 3.6% | 836,458,908 | |
| 2007 | 865,042,467 | 31,260,825 | 3.5% | 896,303,292 | |
| 2008 | 936,818,628 | 35,456,426 | 3.6% | 972,275,054 | |
| 2009 | 968,569,455 | 34,390,085 | 3.4% | 1,002,959,540 | |
| 2010 | 949,128,606 | 39,786,061 | 4.0% | 988,914,667 | |
| 2011 | 1,020,487,749 | 28,136,226 | 2.7% | 1,048,623,975 | 1,059,127,838 |
| 2012 | 1,003,599,206 | 34,925,215 | 3.4% | 1,038,524,421 | 1,078,251,329 |
| 2013 | 1,095,066,725 | 38,882,990 | 3.4% | 1,133,949,715 | 1,105,301,975 |
| 2014 | 1,132,027,794 | 40,195,382 | 3.4% | 1,172,223,177 | 1,139,241,761 |
| 2015 | 1,160,119,849 | 41,192,859 | 3.4% | 1,201,312,707 | 1,159,741,046 |
| 2016 | 1,196,923,445 | 42,499,659 | 3.4% | 1,239,423,104 | 1,187,844,830 |
| 2017 | 1,240,361,566 | 44,042,035 | 3.4% | 1,284,403,601 | 1,211,752,854 |
| 2018 | 1,289,438,641 | 45,784,635 | 3.4% | 1,335,223,276 | 1,241,018,696 |
| 2019 | 1,315,265,682 | 46,701,686 | 3.4% | 1,361,967,369 | 1,265,777,776 |
| 2020 | 1,349,379,781 | 47,912,990 | 3.4% | 1,397,292,771 | 1,297,196,674 |
| 2021 | 1,378,849,492 | 48,959,383 | 3.4% | 1,427,808,875 | 1,325,843,601 |
| 2022 | 1,412,452,611 | 50,152,543 | 3.4% | 1,462,605,154 | 1,357,178,345 |
| 2023 | 1,442,318,623 | 51,213,008 | 3.4% | 1,493,531,631 | 1,386,906,667 |
| 2024 | 1,474,787,725 | 52,365,902 | 3.4% | 1,527,153,627 | 1,417,772,543 |
| 2025 | 1,502,581,162 | 53,352,775 | 3.4% | 1,555,933,937 | 1,443,674,755 |
| 2026 | 1,532,312,590 | 54,408,461 | 3.4% | 1,586,721,051 | 1,472,850,113 |
| 2027 | 1,557,143,419 | 55,290,140 | 3.4% | 1,612,433,559 | 1,495,577,932 |
| 2028 | 1,585,146,051 | 56,284,441 | 3.4% | 1,641,430,492 | 1,524,971,017 |
| 2029 | 1,608,976,579 | 57,130,602 | 3.4% | 1,666,107,181 | 1,550,368,538 |
| 2030 | 1,636,345,317 | 58,102,395 | 3.4% | 1,694,447,712 | 1,580,199,001 |
| 2031 | 1,659,252,406 | 58,915,766 | 3.4% | 1,718,168,172 | 1,606,160,758 |
| 2032 | 1,685,692,856 | 59,854,598 | 3.4% | 1,745,547,454 | 1,636,191,259 |
| 2033 | 1,707,682,043 | 60,635,378 | 3.4% | 1,768,317,421 | 1,662,424,516 |
| 2034 | 1,733,205,502 | 61,541,650 | 3.4% | 1,794,747,152 | 1,692,811,923 |
| 2035 | 1,754,280,657 | 62,289,974 | 3.4% | 1,816,570,631 | 1,722,372,047 |
| 2036 | 1,778,882,249 | 63,163,513 | 3.4% | 1,842,045,762 | 1,753,244,502 |
| 2037 | 1,799,131,300 | 63,882,504 | 3.4% | 1,863,013,804 | 1,780,236,735 |
| 2038 | 1,823,037,865 | 64,731,365 | 3.4% | 1,887,769,230 | 1,811,591,428 |
| 2039 | 1,842,587,690 | 65,425,529 | 3.4% | 1,908,013,219 | 1,838,779,378 |
| 2040 | 1,865,773,745 | 66,248,805 | 3.4% | 1,932,022,550 | 1,873,796,429 |
| 2041 | 1,884,594,675 | 66,917,088 | 3.4% | 1,951,511,763 | |
| 2042 | 1,907,066,643 | 67,715,010 | 3.4% | 1,974,781,653 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 4.3% | 3.5% | | 4.2% | -- |
| 1997-2012 | 5.0% | 4.0% | | 5.0% | -- |
| 2002-2012 | 3.9% | 3.9% | | 3.9% | -- |
| 2007-2012 | 3.0% | 2.2% | | 3.0% | -- |
| 2012-2017 | 4.3% | 4.7% | | 4.3% | 2.4% |
| 2012-2022 | 3.5% | 3.7% | | 3.5% | 2.3% |
| 2012-2032 | 2.6% | 2.7% | | 2.6% | 2.1% |
| 2012-2042 | 2.2% | 2.2% | | 2.2% | |

/1 Distribution losses

Table 3.6

Member Forecasts By Class
Cavalier Rural Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Resale RUS</u> | <u>Resale Other</u> | <u>Total Members</u> |
|-----------------------------|--------------------|---------------------------|-------------------------|------------------------|-------------------------|-------------------|---------------------|----------------------|
| 1983 | 1,565 | 53 | 31 | 1 | 26 | - | 1 | 1,677 |
| 1984 | 1,555 | 54 | 31 | 1 | 27 | - | 1 | 1,669 |
| 1985 | 1,528 | 55 | 31 | - | 27 | 0 | 1 | 1,642 |
| 1986 | 1,508 | 52 | 31 | - | 26 | - | 1 | 1,618 |
| 1987 | 1,499 | 51 | 31 | - | 27 | - | 1 | 1,608 |
| 1988 | 1,482 | 53 | 31 | - | 27 | 1 | 1 | 1,594 |
| 1989 | 1,473 | 57 | 31 | - | 27 | - | - | 1,588 |
| 1990 | 1,456 | 60 | 31 | - | 27 | - | - | 1,574 |
| 1991 | 1,440 | 63 | 31 | - | 28 | - | - | 1,562 |
| 1992 | 1,435 | 64 | 31 | - | 28 | - | - | 1,557 |
| 1993 | 1,437 | 61 | 31 | - | 27 | - | - | 1,556 |
| 1994 | 1,431 | 60 | 31 | - | 27 | - | - | 1,549 |
| 1995 | 1,426 | 60 | 31 | - | 28 | - | - | 1,546 |
| 1996 | 1,414 | 59 | 31 | - | 26 | - | - | 1,531 |
| 1997 | 1,400 | 61 | 31 | - | 26 | - | - | 1,518 |
| 1998 | 1,381 | 62 | 31 | - | 26 | - | - | 1,500 |
| 1999 | 1,365 | 65 | 31 | - | 26 | - | - | 1,487 |
| 2000 | 1,353 | 65 | 11 | - | 25 | - | - | 1,455 |
| 2001 | 1,347 | 63 | - | - | 24 | - | 1 | 1,435 |
| 2002 | 1,345 | 63 | - | - | 25 | - | 1 | 1,434 |
| 2003 | 1,345 | 64 | - | - | 27 | - | - | 1,435 |
| 2004 | 1,340 | 63 | - | - | 27 | - | - | 1,429 |
| 2005 | 1,337 | 63 | - | - | 27 | - | - | 1,427 |
| 2006 | 1,329 | 63 | - | - | 25 | - | - | 1,417 |
| 2007 | 1,332 | 66 | - | - | 26 | - | - | 1,423 |
| 2008 | 1,344 | 72 | - | - | 27 | - | - | 1,443 |
| 2009 | 1,346 | 70 | - | - | 27 | - | - | 1,443 |
| 2010 | 1,354 | 72 | - | - | 27 | - | - | 1,453 |
| 2011 | 1,367 | 73 | - | - | 26 | - | - | 1,466 |
| 2012 | 1,378 | 74 | - | - | 25 | - | - | 1,476 |
| 2013 | 1,386 | 74 | - | - | 25 | - | - | 1,485 |
| 2014 | 1,396 | 74 | 1 | - | 25 | - | - | 1,496 |
| 2015 | 1,405 | 74 | 1 | - | 25 | - | - | 1,505 |
| 2016 | 1,413 | 74 | 1 | - | 25 | - | - | 1,513 |
| 2017 | 1,420 | 75 | 1 | - | 25 | - | - | 1,521 |
| 2018 | 1,425 | 75 | 1 | - | 25 | - | - | 1,526 |
| 2019 | 1,430 | 75 | 1 | - | 25 | - | - | 1,531 |
| 2020 | 1,434 | 75 | 1 | - | 25 | - | - | 1,535 |
| 2021 | 1,437 | 75 | 1 | - | 25 | - | - | 1,538 |
| 2022 | 1,440 | 75 | 1 | - | 25 | - | - | 1,541 |
| 2023 | 1,442 | 76 | 1 | - | 25 | - | - | 1,544 |
| 2024 | 1,443 | 76 | 1 | - | 25 | - | - | 1,545 |
| 2025 | 1,444 | 76 | 1 | - | 25 | - | - | 1,546 |
| 2026 | 1,444 | 76 | 1 | - | 25 | - | - | 1,546 |
| 2027 | 1,445 | 76 | 1 | - | 25 | - | - | 1,547 |
| 2028 | 1,445 | 77 | 1 | - | 25 | - | - | 1,548 |
| 2029 | 1,445 | 77 | 1 | - | 25 | - | - | 1,548 |
| 2030 | 1,444 | 77 | 1 | - | 25 | - | - | 1,547 |
| 2031 | 1,443 | 77 | 1 | - | 25 | - | - | 1,546 |
| 2032 | 1,443 | 77 | 1 | - | 25 | - | - | 1,546 |
| 2033 | 1,442 | 77 | 1 | - | 25 | - | - | 1,545 |
| 2034 | 1,441 | 77 | 1 | - | 25 | - | - | 1,544 |
| 2035 | 1,440 | 78 | 1 | - | 25 | - | - | 1,544 |
| 2036 | 1,439 | 78 | 1 | - | 25 | - | - | 1,543 |
| 2037 | 1,438 | 78 | 1 | - | 25 | - | - | 1,542 |
| 2038 | 1,438 | 78 | 1 | - | 25 | - | - | 1,542 |
| 2039 | 1,437 | 78 | 1 | - | 25 | - | - | 1,541 |
| 2040 | 1,437 | 78 | 1 | - | 25 | - | - | 1,541 |
| 2041 | 1,437 | 79 | 1 | - | 25 | - | - | 1,542 |
| 2042 | 1,437 | 79 | 1 | - | 25 | - | - | 1,542 |
| Average Annual Growth Rates | | | | | | | | |
| 1983-2012 | -0.4% | 1.1% | -100.0% | -100.0% | -0.2% | -- | -100.0% | -0.4% |
| 1997-2012 | -0.2% | 0.7% | -100.0% | -- | -0.5% | -- | -- | -0.3% |
| 2002-2012 | 0.2% | 1.6% | -- | -- | 0.0% | -- | -100.0% | 0.3% |
| 2007-2012 | 0.7% | 2.4% | -- | -- | -0.5% | -- | -- | 0.7% |
| 2012-2017 | 0.6% | 0.3% | -- | -- | 0.0% | -- | -- | 0.6% |
| 2012-2022 | 0.4% | 0.2% | -- | -- | 0.0% | -- | -- | 0.4% |
| 2012-2032 | 0.2% | 0.2% | -- | -- | 0.0% | -- | -- | 0.2% |
| 2012-2042 | 0.1% | 0.2% | -- | -- | 0.0% | -- | -- | 0.1% |

Table 3.7

Energy Forecasts By Class (kWh)
Cavalier Rural Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Resale RUS</u> | <u>Resale Other</u> | <u>Total kWh Sales</u> |
|------------------------------------|--------------------|---------------------------|-------------------------|------------------------|-------------------------|-------------------|---------------------|------------------------|
| 1983 | 31,940,825 | 926,513 | 10,848,320 | 11,240 | 297,548 | - | 312,600 | 44,337,046 |
| 1984 | 31,755,073 | 888,199 | 10,384,320 | - | 288,222 | - | 273,000 | 43,588,814 |
| 1985 | 32,213,187 | 869,122 | 6,629,600 | - | 259,234 | 760 | 270,000 | 40,241,903 |
| 1986 | 30,964,959 | 870,210 | 5,590,240 | - | 261,454 | - | 256,800 | 37,943,663 |
| 1987 | 27,901,523 | 831,076 | 5,626,560 | - | 279,176 | - | 202,200 | 34,840,535 |
| 1988 | 28,663,564 | 889,530 | 5,640,240 | - | 360,422 | 556,400 | 160,200 | 36,270,356 |
| 1989 | 29,321,532 | 1,274,817 | 5,620,960 | - | 347,618 | - | - | 36,564,927 |
| 1990 | 28,392,648 | 2,157,392 | 5,546,440 | - | 450,676 | - | - | 36,547,156 |
| 1991 | 29,548,312 | 1,485,510 | 5,560,040 | - | 528,742 | - | - | 37,122,604 |
| 1992 | 30,547,417 | 1,651,793 | 5,543,840 | - | 491,600 | - | - | 38,234,650 |
| 1993 | 30,518,177 | 1,801,467 | 5,454,720 | - | 488,149 | - | - | 38,262,513 |
| 1994 | 29,756,786 | 1,257,699 | 5,527,240 | - | 543,955 | - | - | 37,085,680 |
| 1995 | 29,865,362 | 1,321,787 | 5,484,800 | - | 553,877 | - | - | 37,225,826 |
| 1996 | 32,600,017 | 1,480,011 | 3,080,000 | - | 621,338 | - | - | 37,781,366 |
| 1997 | 32,202,262 | 1,481,561 | 649,760 | - | 657,972 | - | - | 34,991,555 |
| 1998 | 27,097,763 | 1,475,888 | 412,280 | - | 754,367 | - | - | 29,740,298 |
| 1999 | 28,420,768 | 1,869,597 | 332,800 | - | 656,323 | - | - | 31,279,488 |
| 2000 | 26,161,959 | 1,854,532 | 59,840 | - | 703,940 | - | - | 28,780,271 |
| 2001 | 30,352,403 | 1,751,513 | - | - | 751,620 | - | 244,800 | 33,100,336 |
| 2002 | 31,291,086 | 1,742,813 | - | - | 801,607 | - | 261,600 | 34,097,106 |
| 2003 | 29,712,593 | 2,020,004 | - | - | 806,348 | - | - | 32,538,945 |
| 2004 | 32,322,100 | 1,995,531 | - | - | 821,195 | - | - | 35,138,826 |
| 2005 | 30,052,589 | 1,932,118 | - | - | 775,700 | - | - | 32,760,407 |
| 2006 | 27,669,576 | 1,904,492 | - | - | 804,054 | - | - | 30,378,122 |
| 2007 | 29,616,318 | 2,769,276 | - | - | 832,365 | - | - | 33,217,959 |
| 2008 | 31,461,132 | 4,759,495 | - | - | 936,900 | - | - | 37,157,527 |
| 2009 | 33,118,539 | 4,728,990 | - | - | 909,346 | - | - | 38,756,875 |
| 2010 | 30,890,917 | 5,532,084 | - | - | 954,239 | - | - | 37,377,240 |
| 2011 | 28,422,076 | 5,585,458 | - | - | 965,037 | - | - | 34,972,571 |
| 2012 | 25,509,236 | 5,293,110 | - | - | 936,303 | - | - | 31,738,649 |
| 2013 | 27,997,352 | 5,890,188 | - | - | 940,985 | - | - | 34,828,524 |
| 2014 | 28,385,588 | 5,921,448 | 2,819,360 | - | 945,689 | - | - | 38,072,086 |
| 2015 | 28,522,886 | 5,952,390 | 4,208,000 | - | 950,418 | - | - | 39,633,694 |
| 2016 | 28,592,162 | 5,993,047 | 4,208,000 | - | 955,170 | - | - | 39,748,379 |
| 2017 | 28,933,458 | 6,106,893 | 4,208,000 | - | 959,946 | - | - | 40,208,297 |
| 2018 | 29,247,628 | 6,139,424 | 4,208,000 | - | 964,746 | - | - | 40,559,798 |
| 2019 | 29,345,132 | 6,182,894 | 4,208,000 | - | 969,569 | - | - | 40,705,595 |
| 2020 | 29,546,047 | 6,216,283 | 4,208,000 | - | 974,417 | - | - | 40,944,747 |
| 2021 | 30,088,820 | 6,250,054 | 4,208,000 | - | 979,289 | - | - | 41,526,163 |
| 2022 | 30,592,860 | 6,295,191 | 4,208,000 | - | 984,186 | - | - | 42,080,237 |
| 2023 | 30,927,960 | 6,414,269 | 4,208,000 | - | 989,107 | - | - | 42,539,336 |
| 2024 | 31,300,129 | 6,461,248 | 4,208,000 | - | 994,052 | - | - | 42,963,429 |
| 2025 | 31,580,698 | 6,497,350 | 4,208,000 | - | 999,022 | - | - | 43,285,071 |
| 2026 | 31,669,478 | 6,544,828 | 4,208,000 | - | 1,004,017 | - | - | 43,426,324 |
| 2027 | 31,670,675 | 6,593,846 | 4,208,000 | - | 1,009,038 | - | - | 43,481,559 |
| 2028 | 31,650,403 | 6,718,783 | 4,208,000 | - | 1,014,083 | - | - | 43,591,270 |
| 2029 | 31,631,366 | 6,769,844 | 4,208,000 | - | 1,019,153 | - | - | 43,628,364 |
| 2030 | 31,588,633 | 6,820,874 | 4,208,000 | - | 1,024,249 | - | - | 43,641,756 |
| 2031 | 31,547,386 | 6,872,719 | 4,208,000 | - | 1,029,370 | - | - | 43,657,475 |
| 2032 | 31,527,597 | 6,914,121 | 4,208,000 | - | 1,034,517 | - | - | 43,684,235 |
| 2033 | 31,486,308 | 6,967,472 | 4,208,000 | - | 1,039,690 | - | - | 43,701,469 |
| 2034 | 31,444,168 | 7,021,695 | 4,208,000 | - | 1,044,888 | - | - | 43,718,751 |
| 2035 | 31,402,547 | 7,169,651 | 4,208,000 | - | 1,050,113 | - | - | 43,830,311 |
| 2036 | 31,359,687 | 7,226,428 | 4,208,000 | - | 1,055,363 | - | - | 43,849,478 |
| 2037 | 31,316,201 | 7,270,836 | 4,208,000 | - | 1,060,640 | - | - | 43,855,676 |
| 2038 | 31,291,606 | 7,329,316 | 4,208,000 | - | 1,065,943 | - | - | 43,894,865 |
| 2039 | 31,244,467 | 7,388,794 | 4,208,000 | - | 1,071,273 | - | - | 43,912,534 |
| 2040 | 31,217,151 | 7,450,305 | 4,208,000 | - | 1,076,629 | - | - | 43,952,086 |
| 2041 | 31,188,533 | 7,608,639 | 4,208,000 | - | 1,082,012 | - | - | 44,087,185 |
| 2042 | 31,158,775 | 7,671,978 | 4,208,000 | - | 1,087,422 | - | - | 44,126,176 |
| Average Annual Growth Rates | | | | | | | | |
| 1983-2012 | -0.8% | 6.2% | -100.0% | -100.0% | 4.0% | -- | -100.0% | -1.1% |
| 1997-2012 | -0.9% | 6.0% | -100.0% | -- | 3.3% | -- | -- | -0.9% |
| 2002-2012 | -2.0% | 11.7% | -- | -- | 1.6% | -- | -100.0% | -0.7% |
| 2007-2012 | -2.9% | 13.8% | -- | -- | 2.4% | -- | -- | -0.9% |
| 2012-2017 | 2.6% | 2.9% | -- | -- | 0.5% | -- | -- | 4.8% |
| 2012-2022 | 1.8% | 1.7% | -- | -- | 0.5% | -- | -- | 2.9% |
| 2012-2032 | 1.1% | 1.3% | -- | -- | 0.5% | -- | -- | 1.6% |
| 2012-2042 | 0.7% | 1.2% | -- | -- | 0.5% | -- | -- | 1.1% |

Table 3.8

Energy Requirements Forecast (kWh)
Cavalier Rural Electric Cooperative, Inc.

| | | | | | For Comparison |
|-----------------------------|---------------------------------|--------------------------------------|------------------------------------|-----------------------------|------------------------------|
| Year | Sales to Members kWh | Own-Use and Losses kWh /1 | Own-Use and Losses % /1 | Total Energy kWh | 2011 Forecast kWh |
| 1983 | 44,337,046 | 2,356,154 | 5.0% | 46,693,200 | |
| 1984 | 43,588,814 | 1,199,927 | 2.7% | 44,788,741 | |
| 1985 | 40,241,903 | 2,715,697 | 6.3% | 42,957,600 | |
| 1986 | 37,943,663 | 1,755,337 | 4.4% | 39,699,000 | |
| 1987 | 34,840,535 | 1,754,065 | 4.8% | 36,594,600 | |
| 1988 | 36,270,356 | 2,100,244 | 5.5% | 38,370,600 | |
| 1989 | 36,564,927 | 2,361,873 | 6.1% | 38,926,800 | |
| 1990 | 36,547,156 | 1,555,244 | 4.1% | 38,102,400 | |
| 1991 | 37,122,604 | 2,390,996 | 6.1% | 39,513,600 | |
| 1992 | 38,234,650 | 2,100,565 | 5.2% | 40,335,215 | |
| 1993 | 38,262,513 | 2,644,919 | 6.5% | 40,907,432 | |
| 1994 | 37,085,680 | 2,999,458 | 7.5% | 40,085,138 | |
| 1995 | 37,225,826 | 3,470,145 | 8.5% | 40,695,971 | |
| 1996 | 37,781,366 | 3,288,527 | 8.0% | 41,069,893 | |
| 1997 | 34,991,555 | 2,201,459 | 5.9% | 37,193,014 | |
| 1998 | 29,740,298 | 2,860,198 | 8.8% | 32,600,496 | |
| 1999 | 31,279,488 | 2,674,222 | 7.9% | 33,953,710 | |
| 2000 | 28,780,271 | 3,599,005 | 11.1% | 32,379,276 | |
| 2001 | 33,100,336 | 197,777 | 0.6% | 33,298,113 | |
| 2002 | 34,097,106 | 3,127,990 | 8.4% | 37,225,096 | |
| 2003 | 32,538,945 | 3,289,827 | 9.2% | 35,828,772 | |
| 2004 | 35,138,826 | 3,646,950 | 9.4% | 38,785,776 | |
| 2005 | 32,760,407 | 3,067,349 | 8.6% | 35,827,756 | |
| 2006 | 30,378,122 | 2,846,974 | 8.6% | 33,225,096 | |
| 2007 | 33,217,959 | 3,685,381 | 10.0% | 36,903,340 | |
| 2008 | 37,157,527 | 3,733,460 | 9.1% | 40,890,987 | |
| 2009 | 38,756,875 | 3,777,511 | 8.9% | 42,534,386 | |
| 2010 | 37,377,240 | 3,646,005 | 8.9% | 41,023,245 | |
| 2011 | 34,972,571 | 3,062,812 | 8.1% | 38,035,383 | 40,823,902 |
| 2012 | 31,738,649 | 3,381,958 | 9.6% | 35,120,607 | 40,190,751 |
| 2013 | 34,828,524 | 3,409,375 | 8.9% | 38,237,899 | 40,287,821 |
| 2014 | 38,072,086 | 3,726,888 | 8.9% | 41,798,974 | 40,253,149 |
| 2015 | 39,633,694 | 3,879,754 | 8.9% | 43,513,448 | 40,185,376 |
| 2016 | 39,748,379 | 3,890,981 | 8.9% | 43,639,360 | 40,359,672 |
| 2017 | 40,208,297 | 3,936,002 | 8.9% | 44,144,299 | 40,664,213 |
| 2018 | 40,559,798 | 3,970,411 | 8.9% | 44,530,209 | 41,090,297 |
| 2019 | 40,705,595 | 3,984,683 | 8.9% | 44,690,279 | 41,533,948 |
| 2020 | 40,944,747 | 4,008,094 | 8.9% | 44,952,841 | 41,964,388 |
| 2021 | 41,526,163 | 4,065,009 | 8.9% | 45,591,172 | 42,753,152 |
| 2022 | 42,080,237 | 4,119,247 | 8.9% | 46,199,484 | 43,731,628 |
| 2023 | 42,539,336 | 4,164,189 | 8.9% | 46,703,524 | 44,407,376 |
| 2024 | 42,963,429 | 4,205,703 | 8.9% | 47,169,132 | 44,821,855 |
| 2025 | 43,285,071 | 4,237,189 | 8.9% | 47,522,259 | 45,154,954 |
| 2026 | 43,426,324 | 4,251,016 | 8.9% | 47,677,340 | 45,486,964 |
| 2027 | 43,481,559 | 4,256,423 | 8.9% | 47,737,982 | 45,819,448 |
| 2028 | 43,591,270 | 4,267,163 | 8.9% | 47,858,432 | 46,152,299 |
| 2029 | 43,628,364 | 4,270,794 | 8.9% | 47,899,157 | 46,466,060 |
| 2030 | 43,641,756 | 4,272,105 | 8.9% | 47,913,861 | 46,792,599 |
| 2031 | 43,657,475 | 4,273,644 | 8.9% | 47,931,118 | 47,123,386 |
| 2032 | 43,684,235 | 4,276,263 | 8.9% | 47,960,498 | 47,438,519 |
| 2033 | 43,701,469 | 4,277,950 | 8.9% | 47,979,420 | 47,765,726 |
| 2034 | 43,718,751 | 4,279,642 | 8.9% | 47,998,393 | 48,085,539 |
| 2035 | 43,830,311 | 4,290,563 | 8.9% | 48,120,874 | 48,400,530 |
| 2036 | 43,849,478 | 4,292,439 | 8.9% | 48,141,917 | 48,714,537 |
| 2037 | 43,855,676 | 4,293,046 | 8.9% | 48,148,722 | 49,022,400 |
| 2038 | 43,894,865 | 4,296,882 | 8.9% | 48,191,747 | 49,336,110 |
| 2039 | 43,912,534 | 4,298,611 | 8.9% | 48,211,145 | 49,631,970 |
| 2040 | 43,952,086 | 4,302,483 | 8.9% | 48,254,569 | 49,936,252 |
| 2041 | 44,087,185 | 4,315,708 | 8.9% | 48,402,893 | |
| 2042 | 44,126,176 | 4,319,525 | 8.9% | 48,445,701 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | -1.1% | 1.3% | | -1.0% | -- |
| 1997-2012 | -0.9% | 2.4% | | -0.7% | -- |
| 2002-2012 | -0.7% | 0.8% | | -0.6% | -- |
| 2007-2012 | -0.9% | -1.7% | | -1.0% | -- |
| 2012-2017 | 4.8% | 3.1% | | 4.7% | 0.2% |
| 2012-2022 | 2.9% | 2.0% | | 2.8% | 0.8% |
| 2012-2032 | 1.6% | 1.2% | | 1.6% | 0.8% |
| 2012-2042 | 1.1% | 0.8% | | 1.1% | |

/1 Distribution losses

Table 3.6

Member Forecasts By Class
Clearwater-Polk Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Total Members</u> |
|-----------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|----------------------|
| 1983 | 3,042 | 369 | 24 | 115 | 1 | 3,551 |
| 1984 | 2,862 | 361 | 24 | 113 | 1 | 3,361 |
| 1985 | 2,661 | 360 | 23 | 113 | 1 | 3,158 |
| 1986 | 2,647 | 358 | 24 | 118 | 1 | 3,148 |
| 1987 | 2,650 | 362 | 24 | 125 | 1 | 3,161 |
| 1988 | 2,670 | 375 | 20 | 131 | 1 | 3,196 |
| 1989 | 2,683 | 382 | 18 | 132 | 1 | 3,215 |
| 1990 | 2,725 | 388 | 20 | 132 | 1 | 3,266 |
| 1991 | 2,750 | 384 | 20 | 133 | 1 | 3,288 |
| 1992 | 2,778 | 394 | 23 | 131 | 1 | 3,326 |
| 1993 | 2,822 | 413 | 23 | 131 | 2 | 3,390 |
| 1994 | 2,843 | 429 | 20 | 132 | 2 | 3,427 |
| 1995 | 2,890 | 437 | 15 | 134 | 2 | 3,477 |
| 1996 | 3,016 | 347 | 13 | 136 | 2 | 3,513 |
| 1997 | 3,213 | 173 | 13 | 134 | 2 | 3,535 |
| 1998 | 3,402 | 32 | 15 | 141 | 2 | 3,591 |
| 1999 | 3,497 | - | 13 | 150 | 2 | 3,662 |
| 2000 | 3,552 | - | 14 | 156 | 2 | 3,724 |
| 2001 | 3,608 | - | 12 | 168 | 2 | 3,791 |
| 2002 | 3,680 | - | 12 | 198 | 2 | 3,892 |
| 2003 | 3,749 | - | 11 | 237 | 3 | 4,000 |
| 2004 | 3,812 | - | 15 | 256 | 3 | 4,086 |
| 2005 | 3,889 | - | 13 | 267 | 3 | 4,172 |
| 2006 | 3,953 | - | 14 | 275 | 3 | 4,245 |
| 2007 | 4,003 | - | 16 | 285 | 3 | 4,307 |
| 2008 | 4,035 | - | 17 | 287 | 3 | 4,342 |
| 2009 | 4,052 | - | 17 | 284 | 3 | 4,356 |
| 2010 | 4,080 | - | 17 | 285 | 3 | 4,386 |
| 2011 | 4,094 | - | 17 | 283 | 3 | 4,397 |
| 2012 | 4,095 | - | 13 | 263 | 3 | 4,374 |
| 2013 | 4,101 | - | 13 | 263 | 3 | 4,380 |
| 2014 | 4,114 | - | 13 | 243 | 3 | 4,373 |
| 2015 | 4,131 | - | 13 | 188 | 3 | 4,335 |
| 2016 | 4,151 | - | 13 | 189 | 3 | 4,356 |
| 2017 | 4,175 | - | 13 | 190 | 3 | 4,381 |
| 2018 | 4,196 | - | 13 | 191 | 3 | 4,403 |
| 2019 | 4,214 | - | 13 | 192 | 3 | 4,422 |
| 2020 | 4,230 | - | 13 | 193 | 3 | 4,439 |
| 2021 | 4,246 | - | 13 | 194 | 3 | 4,456 |
| 2022 | 4,258 | - | 13 | 195 | 3 | 4,469 |
| 2023 | 4,269 | - | 13 | 195 | 3 | 4,480 |
| 2024 | 4,278 | - | 13 | 196 | 3 | 4,490 |
| 2025 | 4,286 | - | 13 | 196 | 3 | 4,498 |
| 2026 | 4,293 | - | 13 | 197 | 3 | 4,506 |
| 2027 | 4,300 | - | 13 | 197 | 3 | 4,513 |
| 2028 | 4,306 | - | 13 | 197 | 3 | 4,519 |
| 2029 | 4,312 | - | 13 | 198 | 3 | 4,526 |
| 2030 | 4,317 | - | 13 | 198 | 3 | 4,531 |
| 2031 | 4,321 | - | 13 | 198 | 3 | 4,535 |
| 2032 | 4,326 | - | 13 | 198 | 3 | 4,540 |
| 2033 | 4,330 | - | 13 | 199 | 3 | 4,545 |
| 2034 | 4,334 | - | 13 | 199 | 3 | 4,549 |
| 2035 | 4,338 | - | 13 | 199 | 3 | 4,553 |
| 2036 | 4,342 | - | 13 | 199 | 3 | 4,557 |
| 2037 | 4,347 | - | 13 | 200 | 3 | 4,563 |
| 2038 | 4,353 | - | 13 | 200 | 3 | 4,569 |
| 2039 | 4,360 | - | 13 | 200 | 3 | 4,576 |
| 2040 | 4,368 | - | 13 | 200 | 3 | 4,584 |
| 2041 | 4,376 | - | 13 | 201 | 3 | 4,593 |
| 2042 | 4,384 | - | 13 | 201 | 3 | 4,601 |
| Average Annual Growth Rates | | | | | | |
| 1983-2012 | 1.0% | -100.0% | -2.1% | 2.9% | 3.9% | 0.7% |
| 1997-2012 | 2.0% | -100.0% | -2.8% | 3.6% | 5.6% | 1.4% |
| 2002-2012 | 1.1% | -- | 0.7% | 2.9% | 4.1% | 1.2% |
| 2007-2012 | 0.5% | -- | -4.2% | -1.5% | 0.0% | 0.3% |
| 2012-2017 | 0.4% | -- | 0.0% | -6.3% | 0.0% | 0.0% |
| 2012-2022 | 0.4% | -- | 0.0% | -3.0% | 0.0% | 0.2% |
| 2012-2032 | 0.3% | -- | 0.0% | -1.4% | 0.0% | 0.2% |
| 2012-2042 | 0.2% | -- | 0.0% | -0.9% | 0.0% | 0.2% |

Table 3.7

Energy Forecasts By Class (kWh)
Clearwater-Polk Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Total kWh Sales</u> |
|-----------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|
| 1983 | 35,645,173 | 560,080 | 610,320 | 2,619,390 | 426,240 | 39,861,203 |
| 1984 | 37,728,780 | 555,200 | 579,860 | 2,661,700 | 553,920 | 42,079,460 |
| 1985 | 38,122,380 | 568,710 | 457,630 | 2,904,230 | 334,080 | 42,387,030 |
| 1986 | 38,912,370 | 604,880 | 474,520 | 3,454,096 | 361,280 | 43,807,146 |
| 1987 | 37,220,100 | 563,930 | 642,000 | 4,403,116 | 388,480 | 43,217,626 |
| 1988 | 40,110,412 | 657,160 | 485,810 | 4,764,176 | 1,074,920 | 47,092,478 |
| 1989 | 41,766,200 | 734,750 | 399,280 | 4,558,129 | 659,060 | 48,117,419 |
| 1990 | 42,287,640 | 781,890 | 533,830 | 3,860,460 | 585,280 | 48,049,100 |
| 1991 | 42,813,420 | 744,590 | 594,540 | 3,837,862 | 1,188,480 | 49,178,892 |
| 1992 | 43,525,900 | 805,920 | 767,190 | 3,796,700 | 357,120 | 49,252,830 |
| 1993 | 45,758,250 | 967,750 | 475,320 | 4,219,080 | 631,730 | 52,052,130 |
| 1994 | 46,022,490 | 1,016,870 | 485,510 | 4,656,620 | 1,865,700 | 54,047,190 |
| 1995 | 47,969,632 | 987,480 | 344,830 | 4,708,218 | 2,064,070 | 56,074,230 |
| 1996 | 52,997,887 | 1,286,490 | 300,707 | 4,608,844 | 1,943,720 | 61,137,648 |
| 1997 | 53,438,842 | 742,820 | 390,862 | 5,137,361 | 2,428,320 | 62,138,205 |
| 1998 | 49,363,352 | 307,830 | 615,156 | 5,201,519 | 2,869,840 | 58,357,697 |
| 1999 | 54,803,797 | - | 336,768 | 5,381,766 | 2,606,953 | 63,129,284 |
| 2000 | 54,398,835 | - | 643,461 | 5,734,573 | 2,379,304 | 63,156,173 |
| 2001 | 57,683,605 | - | 351,186 | 6,020,834 | 1,154,512 | 65,210,137 |
| 2002 | 61,416,624 | - | 452,116 | 6,551,188 | 1,232,448 | 69,652,376 |
| 2003 | 61,199,231 | - | 610,240 | 6,827,870 | 1,681,566 | 70,318,907 |
| 2004 | 60,983,363 | - | 879,368 | 7,056,828 | 2,464,976 | 71,384,535 |
| 2005 | 61,087,464 | - | 684,239 | 7,510,046 | 2,013,680 | 71,295,429 |
| 2006 | 61,567,256 | - | 517,249 | 7,434,729 | 2,177,181 | 71,696,415 |
| 2007 | 63,144,549 | - | 828,455 | 7,384,214 | 2,204,736 | 73,561,954 |
| 2008 | 68,540,619 | - | 921,184 | 7,179,684 | 2,193,520 | 78,835,007 |
| 2009 | 70,205,448 | - | 586,929 | 6,653,902 | 2,226,688 | 79,672,967 |
| 2010 | 63,960,915 | - | 614,148 | 6,442,885 | 2,288,848 | 73,306,796 |
| 2011 | 65,870,271 | - | 407,488 | 6,455,395 | 1,941,344 | 74,674,498 |
| 2012 | 60,251,939 | - | 429,766 | 6,149,142 | 1,891,984 | 68,722,831 |
| 2013 | 61,565,083 | - | 472,856 | 5,859,064 | 1,960,000 | 69,857,003 |
| 2014 | 62,427,150 | - | 472,856 | 5,814,459 | 1,960,000 | 70,674,466 |
| 2015 | 62,968,086 | - | 472,856 | 5,757,718 | 1,960,000 | 71,158,660 |
| 2016 | 62,627,158 | - | 472,856 | 5,783,801 | 1,960,000 | 70,843,815 |
| 2017 | 63,068,151 | - | 472,856 | 5,809,553 | 1,960,000 | 71,310,559 |
| 2018 | 64,291,779 | - | 472,856 | 5,834,903 | 1,960,000 | 72,559,538 |
| 2019 | 64,681,057 | - | 472,856 | 5,857,298 | 1,960,000 | 72,971,211 |
| 2020 | 64,750,729 | - | 472,856 | 5,881,889 | 1,960,000 | 73,065,474 |
| 2021 | 65,743,904 | - | 472,856 | 5,906,156 | 1,960,000 | 74,082,916 |
| 2022 | 67,639,696 | - | 472,856 | 5,929,961 | 1,960,000 | 76,002,513 |
| 2023 | 68,303,964 | - | 472,856 | 5,920,399 | 1,960,000 | 76,657,219 |
| 2024 | 69,432,511 | - | 472,856 | 5,940,765 | 1,960,000 | 77,806,132 |
| 2025 | 70,346,849 | - | 472,856 | 5,930,321 | 1,960,000 | 78,710,027 |
| 2026 | 70,976,047 | - | 472,856 | 5,952,282 | 1,960,000 | 79,361,185 |
| 2027 | 71,023,676 | - | 472,856 | 5,940,782 | 1,960,000 | 79,397,314 |
| 2028 | 71,059,362 | - | 472,856 | 5,928,785 | 1,960,000 | 79,421,004 |
| 2029 | 71,090,283 | - | 472,856 | 5,949,353 | 1,960,000 | 79,472,492 |
| 2030 | 71,106,567 | - | 472,856 | 5,936,168 | 1,960,000 | 79,475,591 |
| 2031 | 71,115,469 | - | 472,856 | 5,919,878 | 1,960,000 | 79,468,203 |
| 2032 | 71,123,954 | - | 472,856 | 5,905,613 | 1,960,000 | 79,462,423 |
| 2033 | 71,127,297 | - | 472,856 | 5,923,907 | 1,960,000 | 79,484,060 |
| 2034 | 71,134,075 | - | 472,856 | 5,908,370 | 1,960,000 | 79,475,301 |
| 2035 | 71,130,514 | - | 472,856 | 5,892,261 | 1,960,000 | 79,455,631 |
| 2036 | 71,138,509 | - | 472,856 | 5,875,463 | 1,960,000 | 79,446,827 |
| 2037 | 71,154,263 | - | 472,856 | 5,891,242 | 1,960,000 | 79,478,361 |
| 2038 | 71,181,749 | - | 472,856 | 5,873,001 | 1,960,000 | 79,487,607 |
| 2039 | 71,218,395 | - | 472,856 | 5,854,167 | 1,960,000 | 79,505,418 |
| 2040 | 71,267,136 | - | 472,856 | 5,834,489 | 1,960,000 | 79,534,481 |
| 2041 | 71,311,838 | - | 472,856 | 5,847,470 | 1,960,000 | 79,592,164 |
| 2042 | 71,351,369 | - | 472,856 | 5,826,338 | 1,960,000 | 79,610,563 |
| Average Annual Growth Rates | | | | | | |
| 1983-2012 | 1.8% | -100.0% | -1.2% | 3.0% | 5.3% | 1.9% |
| 1997-2012 | 1.6% | -100.0% | -2.9% | 2.4% | 8.7% | 1.7% |
| 2002-2012 | -0.2% | -- | -0.5% | -0.6% | 4.4% | -0.1% |
| 2007-2012 | -0.9% | -- | -12.3% | -3.6% | -3.0% | -1.4% |
| 2012-2017 | 0.9% | -- | 1.9% | -1.1% | 0.7% | 0.7% |
| 2012-2022 | 1.2% | -- | 1.0% | -0.4% | 0.4% | 1.0% |
| 2012-2032 | 0.8% | -- | 0.5% | -0.2% | 0.2% | 0.7% |
| 2012-2042 | 0.6% | -- | 0.3% | -0.2% | 0.1% | 0.5% |

Table 3.8

Energy Requirements Forecast (kWh)
Clearwater-Polk Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|----------------|----------------------|-------------------|---------------|---|
| | Members kWh | and Losses kWh /1 | and Losses %/1 | Energy kWh | |
| 1983 | 39,861,203 | 4,134,097 | 9.4% | 43,995,300 | |
| 1984 | 42,079,460 | 3,552,940 | 7.8% | 45,632,400 | |
| 1985 | 42,387,030 | 4,423,770 | 9.5% | 46,810,800 | |
| 1986 | 43,807,146 | 3,465,354 | 7.3% | 47,272,500 | |
| 1987 | 43,217,626 | 4,400,174 | 9.2% | 47,617,800 | |
| 1988 | 47,092,478 | 4,899,322 | 9.4% | 51,991,800 | |
| 1989 | 48,117,419 | 5,589,181 | 10.4% | 53,706,600 | |
| 1990 | 48,049,100 | 2,656,300 | 5.2% | 50,705,400 | |
| 1991 | 49,178,892 | 5,326,608 | 9.8% | 54,505,500 | |
| 1992 | 49,252,830 | 4,393,054 | 8.2% | 53,645,884 | |
| 1993 | 52,052,130 | 5,737,196 | 9.9% | 57,789,326 | |
| 1994 | 54,047,190 | 5,313,350 | 9.0% | 59,360,540 | |
| 1995 | 56,074,230 | 5,804,304 | 9.4% | 61,878,534 | |
| 1996 | 61,137,648 | 4,588,278 | 7.0% | 65,725,926 | |
| 1997 | 62,138,205 | 3,905,610 | 5.9% | 66,043,815 | |
| 1998 | 58,357,697 | 4,469,784 | 7.1% | 62,827,481 | |
| 1999 | 63,129,284 | 3,317,916 | 5.0% | 66,447,200 | |
| 2000 | 63,156,173 | 5,481,427 | 8.0% | 68,637,600 | |
| 2001 | 65,210,137 | 4,856,861 | 6.9% | 70,066,998 | |
| 2002 | 69,652,376 | 6,084,413 | 8.0% | 75,736,789 | |
| 2003 | 70,318,907 | 6,273,291 | 8.2% | 76,592,198 | |
| 2004 | 71,384,535 | 5,642,162 | 7.3% | 77,026,697 | |
| 2005 | 71,295,429 | 6,333,395 | 8.2% | 77,628,824 | |
| 2006 | 71,696,415 | 5,712,959 | 7.4% | 77,409,374 | |
| 2007 | 73,561,954 | 6,818,714 | 8.5% | 80,380,668 | |
| 2008 | 78,835,007 | 7,148,808 | 8.3% | 85,983,815 | |
| 2009 | 79,672,967 | 5,908,856 | 6.9% | 85,581,823 | |
| 2010 | 73,306,796 | 6,656,362 | 8.3% | 79,963,158 | |
| 2011 | 74,674,498 | 4,762,668 | 6.0% | 79,437,166 | 81,799,735 |
| 2012 | 68,722,831 | 5,480,146 | 7.4% | 74,202,977 | 83,835,626 |
| 2013 | 69,857,003 | 5,570,081 | 7.4% | 75,427,084 | 84,899,696 |
| 2014 | 70,674,466 | 5,635,262 | 7.4% | 76,309,728 | 85,774,127 |
| 2015 | 71,158,660 | 5,673,869 | 7.4% | 76,832,529 | 86,750,035 |
| 2016 | 70,843,815 | 5,648,765 | 7.4% | 76,492,580 | 87,816,184 |
| 2017 | 71,310,559 | 5,685,981 | 7.4% | 76,996,541 | 89,428,691 |
| 2018 | 72,559,538 | 5,785,569 | 7.4% | 78,345,107 | 91,288,906 |
| 2019 | 72,971,211 | 5,818,394 | 7.4% | 78,789,605 | 93,009,403 |
| 2020 | 73,065,474 | 5,825,910 | 7.4% | 78,891,384 | 94,846,443 |
| 2021 | 74,082,916 | 5,907,036 | 7.4% | 79,989,953 | 98,670,003 |
| 2022 | 76,002,513 | 6,060,096 | 7.4% | 82,062,609 | 101,595,419 |
| 2023 | 76,657,219 | 6,112,300 | 7.4% | 82,769,519 | 103,753,195 |
| 2024 | 77,806,132 | 6,203,909 | 7.4% | 84,010,041 | 105,336,213 |
| 2025 | 78,710,027 | 6,275,981 | 7.4% | 84,986,008 | 106,946,467 |
| 2026 | 79,361,185 | 6,327,902 | 7.4% | 85,689,087 | 108,565,744 |
| 2027 | 79,397,314 | 6,330,782 | 7.4% | 85,728,096 | 110,241,987 |
| 2028 | 79,421,004 | 6,332,671 | 7.4% | 85,753,675 | 111,878,682 |
| 2029 | 79,472,492 | 6,336,777 | 7.4% | 85,809,269 | 113,538,430 |
| 2030 | 79,475,591 | 6,337,024 | 7.4% | 85,812,615 | 115,201,671 |
| 2031 | 79,468,203 | 6,336,435 | 7.4% | 85,804,638 | 116,931,511 |
| 2032 | 79,462,423 | 6,335,974 | 7.4% | 85,798,396 | 118,626,222 |
| 2033 | 79,484,060 | 6,337,699 | 7.4% | 85,821,759 | 120,328,973 |
| 2034 | 79,475,301 | 6,337,001 | 7.4% | 85,812,301 | 122,043,706 |
| 2035 | 79,455,631 | 6,335,432 | 7.4% | 85,791,063 | 123,817,218 |
| 2036 | 79,446,827 | 6,334,730 | 7.4% | 85,781,558 | 125,545,080 |
| 2037 | 79,478,361 | 6,337,245 | 7.4% | 85,815,606 | 127,278,236 |
| 2038 | 79,487,607 | 6,337,982 | 7.4% | 85,825,589 | 129,012,387 |
| 2039 | 79,505,418 | 6,339,402 | 7.4% | 85,844,820 | 130,755,107 |
| 2040 | 79,534,481 | 6,341,719 | 7.4% | 85,876,200 | 132,489,568 |
| 2041 | 79,592,164 | 6,346,319 | 7.4% | 85,938,482 | |
| 2042 | 79,610,563 | 6,347,786 | 7.4% | 85,958,348 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 1.9% | 1.0% | | 1.8% | -- |
| 1997-2012 | 1.7% | 1.1% | | 1.6% | -- |
| 2002-2012 | -0.1% | -1.0% | | -0.2% | -- |
| 2007-2012 | -1.4% | -4.3% | | -1.6% | -- |
| 2012-2017 | 0.7% | 0.7% | | 0.7% | 1.3% |
| 2012-2022 | 1.0% | 1.0% | | 1.0% | 1.9% |
| 2012-2032 | 0.7% | 0.7% | | 0.7% | 1.8% |
| 2012-2042 | 0.5% | 0.5% | | 0.5% | |

/1 Distribution losses

Table 3.8

Member Forecasts By Class
Nodak Electric Cooperative, Inc.

| Year | Residential | Seasonal | Irrigation | General Commercial | Large Commercial | Street Lighting | Public Authority | Resale Other | Total Members |
|------------------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------------|---------------------|----------------------|
| 1983 | 11,695 | 399 | 55 | 1,204 | 5 | 85 | 74 | 4 | 13,520 |
| 1984 | 11,753 | 402 | 55 | 1,228 | 6 | 81 | 74 | 2 | 13,602 |
| 1985 | 11,805 | 426 | 51 | 1,269 | 7 | 81 | 74 | 2 | 13,714 |
| 1986 | 11,817 | 453 | 51 | 1,337 | 7 | 80 | 74 | 2 | 13,821 |
| 1987 | 11,853 | 445 | 51 | 1,389 | 8 | 80 | 74 | 2 | 13,902 |
| 1988 | 11,799 | 456 | 54 | 1,404 | 8 | 76 | 74 | 2 | 13,873 |
| 1989 | 11,801 | 469 | 55 | 1,425 | 8 | 76 | 74 | 2 | 13,910 |
| 1990 | 11,741 | 476 | 56 | 1,485 | 10 | 80 | 74 | 2 | 13,923 |
| 1991 | 11,718 | 479 | 87 | 1,494 | 11 | 81 | 74 | 2 | 13,947 |
| 1992 | 11,750 | 476 | 114 | 1,516 | 11 | 82 | 74 | 2 | 14,025 |
| 1993 | 11,847 | 454 | 120 | 1,555 | 11 | 82 | 74 | 2 | 14,146 |
| 1994 | 11,994 | 428 | 126 | 1,611 | 11 | 83 | 74 | 2 | 14,329 |
| 1995 | 12,026 | 428 | 130 | 1,709 | 11 | 83 | 74 | 2 | 14,463 |
| 1996 | 12,119 | 420 | 132 | 1,726 | 11 | 85 | 74 | 2 | 14,569 |
| 1997 | 12,323 | 408 | 137 | 1,750 | 11 | 87 | 74 | 2 | 14,792 |
| 1998 | 12,431 | 396 | 143 | 1,816 | 12 | 89 | 74 | 2 | 14,963 |
| 1999 | 12,342 | 391 | 147 | 1,975 | 12 | 90 | 66 | 2 | 15,024 |
| 2000 | 12,683 | 380 | 104 | 1,935 | 12 | 90 | 57 | 2 | 15,262 |
| 2001 | 15,134 | - | 82 | 513 | 16 | 39 | 1 | 2 | 15,787 |
| 2002 | 15,091 | 52 | 83 | 410 | 18 | 26 | 1 | 2 | 15,684 |
| 2003 | 15,395 | - | 124 | 356 | 18 | - | 1 | 2 | 15,896 |
| 2004 | 15,712 | - | 140 | 322 | 18 | - | 1 | 2 | 16,195 |
| 2005 | 15,910 | - | 141 | 327 | 18 | - | 1 | 2 | 16,398 |
| 2006 | 16,154 | - | 142 | 311 | 24 | - | 1 | 2 | 16,633 |
| 2007 | 16,345 | - | 142 | 302 | 26 | - | 2 | 2 | 16,819 |
| 2008 | 16,526 | - | 145 | 302 | 26 | - | 2 | 2 | 17,003 |
| 2009 | 16,696 | - | 147 | 307 | 30 | - | 2 | 2 | 17,184 |
| 2010 | 16,813 | - | 152 | 302 | 33 | - | 2 | 2 | 17,304 |
| 2011 | 16,910 | - | 152 | 290 | 40 | - | 2 | 2 | 17,397 |
| 2012 | 17,069 | - | 159 | 292 | 42 | - | 2 | 2 | 17,566 |
| 2013 | 17,244 | - | 161 | 297 | 43 | - | 2 | 2 | 17,749 |
| 2014 | 17,428 | - | 163 | 302 | 47 | - | 2 | 2 | 17,944 |
| 2015 | 17,608 | - | 165 | 307 | 46 | - | 2 | 2 | 18,130 |
| 2016 | 17,776 | - | 167 | 312 | 48 | - | 2 | 2 | 18,307 |
| 2017 | 17,929 | - | 169 | 317 | 48 | - | 2 | 2 | 18,468 |
| 2018 | 18,079 | - | 171 | 322 | 49 | - | 2 | 2 | 18,626 |
| 2019 | 18,229 | - | 173 | 327 | 49 | - | 2 | 2 | 18,783 |
| 2020 | 18,379 | - | 175 | 332 | 50 | - | 2 | 2 | 18,941 |
| 2021 | 18,529 | - | 177 | 337 | 50 | - | 2 | 2 | 19,098 |
| 2022 | 18,679 | - | 179 | 342 | 50 | - | 2 | 2 | 19,255 |
| 2023 | 18,829 | - | 181 | 347 | 51 | - | 2 | 2 | 19,413 |
| 2024 | 18,979 | - | 183 | 352 | 51 | - | 2 | 2 | 19,570 |
| 2025 | 19,129 | - | 185 | 357 | 51 | - | 2 | 2 | 19,727 |
| 2026 | 19,279 | - | 187 | 362 | 52 | - | 2 | 2 | 19,885 |
| 2027 | 19,429 | - | 189 | 367 | 52 | - | 2 | 2 | 20,042 |
| 2028 | 19,579 | - | 191 | 372 | 52 | - | 2 | 2 | 20,199 |
| 2029 | 19,729 | - | 193 | 377 | 53 | - | 2 | 2 | 20,357 |
| 2030 | 19,879 | - | 195 | 382 | 53 | - | 2 | 2 | 20,514 |
| 2031 | 20,029 | - | 197 | 387 | 53 | - | 2 | 2 | 20,671 |
| 2032 | 20,179 | - | 199 | 392 | 53 | - | 2 | 2 | 20,828 |
| 2033 | 20,329 | - | 201 | 397 | 54 | - | 2 | 2 | 20,986 |
| 2034 | 20,479 | - | 203 | 402 | 54 | - | 2 | 2 | 21,143 |
| 2035 | 20,629 | - | 205 | 407 | 54 | - | 2 | 2 | 21,300 |
| 2036 | 20,779 | - | 207 | 412 | 54 | - | 2 | 2 | 21,457 |
| 2037 | 20,929 | - | 209 | 417 | 55 | - | 2 | 2 | 21,615 |
| 2038 | 21,079 | - | 211 | 422 | 55 | - | 2 | 2 | 21,772 |
| 2039 | 21,229 | - | 213 | 427 | 55 | - | 2 | 2 | 21,929 |
| 2040 | 21,379 | - | 215 | 432 | 55 | - | 2 | 2 | 22,086 |
| 2041 | 21,529 | - | 217 | 437 | 55 | - | 2 | 2 | 22,243 |
| 2042 | 21,679 | - | 219 | 442 | 55 | - | 2 | 2 | 22,400 |
| Average Annual Growth Rates | | | | | | | | | |
| 1983-2012 | 1.3% | -100.0% | 3.7% | -4.8% | 7.6% | -100.0% | -11.7% | -2.4% | 0.9% |
| 1997-2012 | 1.9% | -100.0% | 1.7% | -7.9% | 6.9% | -100.0% | -16.5% | 0.0% | 1.1% |
| 2002-2012 | 1.2% | -100.0% | 6.7% | -3.3% | 8.8% | -100.0% | 7.2% | 0.0% | 1.1% |
| 2007-2012 | 0.9% | -- | 2.3% | -0.7% | 10.1% | -- | 0.0% | 0.0% | 0.9% |
| 2012-2017 | 1.0% | -- | 1.2% | 1.7% | 2.7% | -- | 0.0% | 0.0% | 1.0% |
| 2012-2022 | 0.9% | -- | 1.2% | 1.6% | 1.8% | -- | 0.0% | 0.0% | 0.9% |
| 2012-2032 | 0.8% | -- | 1.1% | 1.5% | 1.2% | -- | 0.0% | 0.0% | 0.9% |
| 2012-2042 | 0.8% | -- | 1.1% | 1.4% | 0.9% | -- | 0.0% | 0.0% | 0.8% |

Table 3.9

Energy Forecasts By Class (kWh)
Nodak Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Public Authority</u> | <u>Resale Other</u> | <u>Total kWh Sales</u> |
|-------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|-------------------------|---------------------|------------------------|
| 1983 | 259,744,497 | 507,173 | 1,443,386 | 67,066,264 | 42,402,813 | 463,260 | 112,667,797 | 11,692,770 | 495,987,960 |
| 1984 | 259,725,691 | 611,429 | 2,153,045 | 73,934,890 | 45,741,882 | 426,040 | 110,520,717 | 3,892,072 | 497,005,766 |
| 1985 | 268,875,620 | 853,987 | 1,472,235 | 81,026,744 | 53,157,060 | 436,680 | 110,777,594 | 3,931,672 | 520,531,592 |
| 1986 | 255,017,708 | 800,124 | 967,582 | 91,708,299 | 37,038,214 | 495,217 | 106,684,229 | 3,045,471 | 495,756,844 |
| 1987 | 231,738,507 | 495,713 | 1,082,116 | 81,403,467 | 23,705,881 | 446,680 | 107,884,549 | 2,308,071 | 449,064,984 |
| 1988 | 252,332,653 | 554,841 | 2,799,548 | 86,184,395 | 38,595,581 | 392,759 | 118,013,172 | 3,200,871 | 502,073,820 |
| 1989 | 257,622,190 | 643,041 | 2,696,864 | 84,722,802 | 32,334,226 | 355,679 | 120,600,802 | 3,355,602 | 502,331,206 |
| 1990 | 247,559,134 | 664,808 | 2,174,898 | 84,452,094 | 50,005,621 | 370,379 | 117,981,561 | 2,721,193 | 505,929,688 |
| 1991 | 259,999,114 | 689,475 | 3,310,899 | 92,253,592 | 49,686,165 | 475,790 | 122,672,249 | 3,470,116 | 532,557,400 |
| 1992 | 252,176,112 | 786,021 | 3,406,745 | 102,170,039 | 53,852,462 | 211,385 | 119,496,340 | 2,839,998 | 534,939,102 |
| 1993 | 267,149,486 | 831,080 | 1,231,500 | 111,498,333 | 60,523,964 | 262,999 | 119,234,331 | 2,949,349 | 563,681,042 |
| 1994 | 262,770,617 | 726,803 | 2,604,096 | 112,955,382 | 69,817,020 | 276,547 | 117,636,756 | 3,132,291 | 569,919,512 |
| 1995 | 269,555,486 | 675,888 | 3,216,376 | 129,382,809 | 75,251,950 | 284,189 | 118,400,153 | 3,236,668 | 600,003,519 |
| 1996 | 284,473,142 | 713,984 | 3,749,012 | 134,125,129 | 69,027,235 | 282,844 | 119,783,643 | 3,552,027 | 615,707,016 |
| 1997 | 267,273,545 | 702,645 | 3,577,976 | 135,886,245 | 71,021,805 | 286,878 | 104,800,493 | 3,548,641 | 587,098,228 |
| 1998 | 242,554,091 | 828,239 | 5,593,440 | 132,714,812 | 87,915,340 | 271,921 | 90,398,349 | 2,881,174 | 563,157,366 |
| 1999 | 249,693,072 | 964,118 | 4,348,705 | 140,031,755 | 101,783,971 | 401,052 | 85,480,474 | 3,059,064 | 585,762,211 |
| 2000 | 325,244,216 | 996,875 | 3,769,965 | 87,831,411 | 114,411,460 | 370,170 | 69,512,280 | 2,948,035 | 605,084,412 |
| 2001 | 316,435,955 | - | 2,128,059 | 105,929,422 | 152,811,522 | 185,767 | 66,340,800 | 2,485,898 | 646,317,423 |
| 2002 | 330,990,983 | 684,620 | 3,263,703 | 105,340,921 | 162,419,881 | 899,176 | 67,483,200 | 3,089,736 | 674,172,220 |
| 2003 | 331,404,803 | - | 5,018,532 | 116,983,145 | 154,510,712 | - | 66,069,600 | 3,122,096 | 677,108,888 |
| 2004 | 343,061,446 | - | 4,273,638 | 115,754,275 | 159,944,772 | - | 65,363,040 | 3,632,482 | 692,029,653 |
| 2005 | 340,893,400 | - | 3,909,800 | 115,480,936 | 164,941,427 | - | 63,326,400 | 1,838,010 | 690,389,973 |
| 2006 | 338,450,426 | - | 8,282,098 | 113,123,496 | 217,092,605 | - | 63,674,521 | 3,507,050 | 744,130,196 |
| 2007 | 353,912,325 | - | 4,622,025 | 111,607,615 | 228,143,527 | - | 105,248,028 | 3,504,906 | 807,038,426 |
| 2008 | 378,711,289 | - | 5,504,935 | 107,215,656 | 230,136,752 | - | 104,920,488 | 3,806,561 | 830,295,681 |
| 2009 | 402,964,864 | - | 5,422,863 | 106,400,762 | 227,257,183 | - | 102,995,370 | 3,984,630 | 849,025,672 |
| 2010 | 378,561,772 | - | 4,791,882 | 105,563,464 | 264,788,480 | - | 98,123,917 | 3,417,779 | 855,247,294 |
| 2011 | 380,811,944 | - | 3,487,881 | 98,448,499 | 399,676,594 | - | 89,686,386 | 3,283,858 | 975,395,162 |
| 2012 | 355,658,518 | - | 8,466,645 | 100,310,122 | 451,585,197 | - | 92,845,241 | 3,332,757 | 1,012,198,480 |
| 2013 | 372,334,768 | - | 8,572,865 | 102,193,687 | 449,241,739 | - | 92,381,015 | 3,344,798 | 1,028,068,872 |
| 2014 | 373,636,450 | - | 8,679,086 | 102,251,628 | 475,821,549 | - | 91,919,110 | 3,344,798 | 1,055,652,620 |
| 2015 | 376,031,608 | - | 8,785,306 | 103,844,323 | 485,260,052 | - | 91,459,514 | 3,344,798 | 1,068,725,601 |
| 2016 | 378,266,655 | - | 8,891,526 | 107,525,958 | 502,122,330 | - | 91,002,217 | 3,344,798 | 1,091,153,484 |
| 2017 | 381,767,004 | - | 8,997,747 | 111,291,100 | 502,579,129 | - | 90,547,206 | 3,344,798 | 1,098,526,983 |
| 2018 | 386,008,919 | - | 9,103,967 | 115,143,880 | 503,038,715 | - | 90,094,469 | 3,344,798 | 1,106,734,749 |
| 2019 | 390,399,352 | - | 9,210,187 | 119,084,092 | 513,501,114 | - | 89,643,997 | 3,344,798 | 1,125,183,541 |
| 2020 | 394,441,262 | - | 9,316,408 | 123,114,305 | 519,966,350 | - | 89,195,777 | 3,344,798 | 1,139,378,899 |
| 2021 | 398,851,602 | - | 9,422,628 | 127,233,894 | 520,434,446 | - | 88,749,798 | 3,344,798 | 1,148,037,166 |
| 2022 | 403,802,955 | - | 9,528,848 | 131,444,141 | 520,905,427 | - | 88,306,049 | 3,344,798 | 1,157,332,219 |
| 2023 | 409,032,426 | - | 9,635,069 | 135,747,971 | 527,379,319 | - | 87,864,519 | 3,344,798 | 1,173,004,102 |
| 2024 | 413,778,055 | - | 9,741,289 | 140,144,816 | 527,856,147 | - | 87,425,196 | 3,344,798 | 1,182,290,300 |
| 2025 | 418,482,399 | - | 9,847,509 | 144,637,816 | 528,335,935 | - | 86,988,070 | 3,344,798 | 1,191,636,528 |
| 2026 | 421,572,303 | - | 9,953,730 | 149,224,422 | 534,818,710 | - | 86,553,130 | 3,344,798 | 1,205,467,092 |
| 2027 | 423,969,749 | - | 10,059,950 | 153,910,484 | 535,304,498 | - | 86,120,364 | 3,344,798 | 1,212,709,844 |
| 2028 | 426,491,772 | - | 10,166,170 | 158,694,956 | 535,793,324 | - | 85,689,763 | 3,344,798 | 1,220,180,783 |
| 2029 | 428,676,949 | - | 10,272,391 | 163,583,258 | 542,285,215 | - | 85,261,314 | 3,344,798 | 1,233,423,923 |
| 2030 | 430,777,447 | - | 10,378,611 | 168,574,343 | 542,780,198 | - | 84,835,007 | 3,344,798 | 1,240,690,403 |
| 2031 | 433,381,680 | - | 10,484,831 | 173,670,679 | 543,278,299 | - | 84,410,832 | 3,344,798 | 1,248,571,118 |
| 2032 | 435,622,816 | - | 10,591,051 | 178,876,252 | 543,779,546 | - | 83,988,778 | 3,344,798 | 1,256,203,241 |
| 2033 | 438,348,016 | - | 10,697,272 | 184,191,585 | 550,283,966 | - | 83,568,834 | 3,344,798 | 1,270,434,471 |
| 2034 | 441,034,200 | - | 10,803,492 | 189,620,871 | 550,791,586 | - | 83,150,990 | 3,344,798 | 1,278,745,937 |
| 2035 | 444,035,522 | - | 10,909,712 | 195,162,497 | 551,302,436 | - | 82,735,235 | 3,344,798 | 1,287,490,200 |
| 2036 | 446,942,884 | - | 11,015,933 | 200,823,287 | 551,816,542 | - | 82,321,559 | 3,344,798 | 1,296,265,002 |
| 2037 | 450,068,489 | - | 11,122,153 | 206,603,608 | 558,333,934 | - | 81,909,951 | 3,344,798 | 1,311,382,933 |
| 2038 | 453,020,712 | - | 11,228,373 | 212,508,355 | 558,854,640 | - | 81,500,401 | 3,344,798 | 1,320,457,280 |
| 2039 | 455,793,424 | - | 11,334,594 | 218,541,506 | 559,378,690 | - | 81,092,899 | 3,344,798 | 1,329,485,911 |
| 2040 | 459,031,484 | - | 11,440,814 | 224,703,121 | 559,906,112 | - | 80,687,435 | 3,344,798 | 1,339,113,763 |
| 2041 | 462,265,926 | - | 11,547,034 | 230,998,422 | 560,436,936 | - | 80,283,998 | 3,344,798 | 1,348,877,114 |
| 2042 | 465,496,660 | - | 11,653,255 | 237,430,290 | 560,971,192 | - | 79,882,578 | 3,344,798 | 1,358,778,773 |

Average Annual Growth Rates

| | | | | | | | | | |
|-----------|------|---------|-------|-------|-------|---------|-------|-------|------|
| 1983-2012 | 1.1% | -100.0% | 6.3% | 1.4% | 8.5% | -100.0% | -0.7% | -4.2% | 2.5% |
| 1997-2012 | 1.7% | -100.0% | 4.7% | -0.1% | 11.2% | -100.0% | -1.3% | 0.8% | 3.2% |
| 2002-2012 | 0.7% | -100.0% | 10.0% | -0.5% | 10.8% | -100.0% | 3.2% | 0.8% | 4.1% |
| 2007-2012 | 0.1% | -- | 12.9% | -2.1% | 14.6% | -- | -2.5% | -1.0% | 4.6% |
| 2012-2017 | 1.4% | -- | 1.2% | 2.1% | 2.2% | -- | -0.5% | 0.1% | 1.7% |
| 2012-2022 | 1.3% | -- | 1.2% | 2.7% | 1.4% | -- | -0.5% | 0.0% | 1.3% |
| 2012-2032 | 1.0% | -- | 1.1% | 2.9% | 0.9% | -- | -0.5% | 0.0% | 1.1% |
| 2012-2042 | 0.9% | -- | 1.1% | 2.9% | 0.7% | -- | -0.5% | 0.0% | 1.0% |

Table 3.10

Energy Requirements Forecast (kWh)
Nodak Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison |
|-----------------------------|---------------|---------------|-------------|---------------|-----------------|
| | Members | and Losses | and Losses | Energy | 2011 |
| | <u>kWh</u> | <u>kWh /1</u> | <u>% /1</u> | <u>kWh</u> | <u>Forecast</u> |
| | | | | | <u>kWh</u> |
| 1983 | 495,987,960 | 31,930,166 | 6.0% | 527,918,126 | |
| 1984 | 497,005,766 | 35,323,317 | 6.6% | 532,329,083 | |
| 1985 | 520,531,592 | 24,221,657 | 4.4% | 544,753,249 | |
| 1986 | 495,756,844 | 25,586,773 | 4.9% | 521,343,617 | |
| 1987 | 449,064,984 | 26,083,097 | 5.5% | 475,148,081 | |
| 1988 | 502,073,820 | 23,059,898 | 4.4% | 525,133,718 | |
| 1989 | 502,331,206 | 32,107,498 | 6.0% | 534,438,704 | |
| 1990 | 505,929,688 | 15,303,017 | 2.9% | 521,232,705 | |
| 1991 | 532,557,400 | 28,550,851 | 5.1% | 561,108,251 | |
| 1992 | 534,939,102 | 23,446,224 | 4.2% | 558,385,326 | |
| 1993 | 563,681,042 | 30,808,647 | 5.2% | 594,489,689 | |
| 1994 | 569,919,512 | 28,452,901 | 4.8% | 598,372,413 | |
| 1995 | 600,003,519 | 28,074,452 | 4.5% | 628,077,971 | |
| 1996 | 615,707,016 | 24,925,075 | 3.9% | 640,632,091 | |
| 1997 | 587,098,228 | 32,349,767 | 5.2% | 619,447,995 | |
| 1998 | 563,157,366 | 26,938,451 | 4.6% | 590,095,817 | |
| 1999 | 585,762,211 | 24,454,182 | 4.0% | 610,216,393 | |
| 2000 | 605,084,412 | 18,518,434 | 3.0% | 623,602,846 | |
| 2001 | 646,317,423 | 32,382,668 | 4.8% | 678,700,091 | |
| 2002 | 674,172,220 | 32,713,201 | 4.6% | 706,885,421 | |
| 2003 | 677,108,888 | 27,833,936 | 3.9% | 704,942,824 | |
| 2004 | 692,029,653 | 28,005,210 | 3.9% | 720,034,863 | |
| 2005 | 690,389,973 | 34,848,607 | 4.8% | 725,238,580 | |
| 2006 | 744,130,196 | 27,139,925 | 3.5% | 771,270,121 | |
| 2007 | 807,038,426 | 28,099,809 | 3.4% | 835,138,235 | |
| 2008 | 830,295,681 | 33,838,379 | 3.9% | 864,134,060 | |
| 2009 | 849,025,672 | 35,188,827 | 4.0% | 884,214,499 | |
| 2010 | 855,247,294 | 30,641,420 | 3.5% | 885,888,714 | |
| 2011 | 975,395,162 | 30,159,557 | 3.0% | 1,005,554,719 | 1,004,123,475 |
| 2012 | 1,012,198,480 | 29,706,885 | 2.9% | 1,041,905,365 | 1,014,790,215 |
| 2013 | 1,028,068,872 | 29,071,356 | 2.8% | 1,057,140,229 | 1,022,527,518 |
| 2014 | 1,055,652,620 | 29,851,359 | 2.8% | 1,085,503,980 | 1,030,963,034 |
| 2015 | 1,068,725,601 | 30,221,032 | 2.8% | 1,098,946,633 | 1,039,074,883 |
| 2016 | 1,091,153,484 | 30,855,240 | 2.8% | 1,122,008,724 | 1,047,247,091 |
| 2017 | 1,098,526,983 | 31,063,745 | 2.8% | 1,129,590,728 | 1,058,787,200 |
| 2018 | 1,106,734,749 | 31,295,841 | 2.8% | 1,138,030,590 | 1,067,604,153 |
| 2019 | 1,125,183,541 | 31,817,529 | 2.8% | 1,157,001,070 | 1,076,536,758 |
| 2020 | 1,139,378,899 | 32,218,941 | 2.8% | 1,171,597,839 | 1,086,060,325 |
| 2021 | 1,148,037,166 | 32,463,776 | 2.8% | 1,180,500,942 | 1,098,708,162 |
| 2022 | 1,157,332,219 | 32,726,618 | 2.8% | 1,190,058,837 | 1,108,393,941 |
| 2023 | 1,173,004,102 | 33,169,782 | 2.8% | 1,206,173,883 | 1,119,523,791 |
| 2024 | 1,182,290,300 | 33,432,374 | 2.8% | 1,215,722,674 | 1,129,876,671 |
| 2025 | 1,191,636,528 | 33,696,663 | 2.8% | 1,225,333,190 | 1,142,850,797 |
| 2026 | 1,205,467,092 | 34,087,758 | 2.8% | 1,239,554,851 | 1,151,146,916 |
| 2027 | 1,212,709,844 | 34,292,566 | 2.8% | 1,247,002,410 | 1,159,810,881 |
| 2028 | 1,220,180,783 | 34,503,827 | 2.8% | 1,254,684,609 | 1,168,393,631 |
| 2029 | 1,233,423,923 | 34,878,311 | 2.8% | 1,268,302,235 | 1,180,276,735 |
| 2030 | 1,240,690,403 | 35,083,790 | 2.8% | 1,275,774,193 | 1,188,952,705 |
| 2031 | 1,248,571,118 | 35,306,638 | 2.8% | 1,283,877,757 | 1,197,600,722 |
| 2032 | 1,256,203,241 | 35,522,457 | 2.8% | 1,291,725,698 | 1,206,372,717 |
| 2033 | 1,270,434,471 | 35,924,882 | 2.8% | 1,306,359,354 | 1,215,220,933 |
| 2034 | 1,278,745,937 | 36,159,911 | 2.8% | 1,314,905,848 | 1,224,386,962 |
| 2035 | 1,287,490,200 | 36,407,178 | 2.8% | 1,323,897,378 | 1,233,664,598 |
| 2036 | 1,296,265,002 | 36,655,309 | 2.8% | 1,332,920,311 | 1,242,830,026 |
| 2037 | 1,311,382,933 | 37,082,808 | 2.8% | 1,348,465,741 | 1,252,488,355 |
| 2038 | 1,320,457,280 | 37,339,409 | 2.8% | 1,357,796,689 | 1,262,391,980 |
| 2039 | 1,329,485,911 | 37,594,717 | 2.8% | 1,367,080,628 | 1,272,232,516 |
| 2040 | 1,339,113,763 | 37,866,970 | 2.8% | 1,376,980,733 | 1,281,931,978 |
| 2041 | 1,348,877,114 | 38,143,055 | 2.8% | 1,387,020,169 | |
| 2042 | 1,358,778,773 | 38,423,050 | 2.8% | 1,397,201,823 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 2.5% | -0.2% | | 2.4% | -- |
| 1997-2012 | 3.2% | 1.2% | | 3.2% | -- |
| 2002-2012 | 4.1% | -1.0% | | 4.0% | -- |
| 2007-2012 | 4.6% | 1.1% | | 4.5% | -- |
| 2012-2017 | 1.7% | 0.9% | | 1.6% | 0.9% |
| 2012-2022 | 1.3% | 1.0% | | 1.3% | 0.9% |
| 2012-2032 | 1.1% | 0.9% | | 1.1% | 0.9% |
| 2012-2042 | 1.0% | 0.9% | | 1.0% | |

/1 Distribution losses

Table 3.7

Member Forecasts By Class
North Star Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Total Members</u> |
|------------------------------------|--------------------|-----------------|---------------------------|-------------------------|------------------------|----------------------|
| 1983 | 3,028 | 866 | 407 | 8 | 22 | 4,331 |
| 1984 | 3,076 | 904 | 397 | 8 | 21 | 4,406 |
| 1985 | 3,093 | 928 | 394 | 8 | 21 | 4,444 |
| 1986 | 3,089 | 974 | 378 | 8 | 20 | 4,469 |
| 1987 | 3,120 | 1,036 | 380 | 8 | 19 | 4,563 |
| 1988 | 3,176 | 1,079 | 389 | 7 | 19 | 4,670 |
| 1989 | 3,257 | 1,101 | 408 | 7 | 18 | 4,792 |
| 1990 | 3,398 | 1,116 | 417 | 7 | 18 | 4,956 |
| 1991 | 3,508 | 1,169 | 437 | 7 | 18 | 5,138 |
| 1992 | 3,559 | 1,227 | 437 | 8 | 17 | 5,248 |
| 1993 | 3,606 | 1,253 | 441 | 8 | 18 | 5,326 |
| 1994 | 3,663 | 1,286 | 436 | 8 | 16 | 5,408 |
| 1995 | 3,702 | 1,311 | 436 | 11 | 17 | 5,477 |
| 1996 | 3,750 | 1,312 | 440 | 11 | 18 | 5,531 |
| 1997 | 3,799 | 1,340 | 445 | 11 | 19 | 5,613 |
| 1998 | 3,866 | 1,367 | 444 | 11 | 19 | 5,707 |
| 1999 | 3,941 | 1,406 | 450 | 11 | 19 | 5,827 |
| 2000 | 4,011 | 1,442 | 458 | 11 | 19 | 5,942 |
| 2001 | 4,074 | 1,446 | 468 | 11 | 21 | 6,020 |
| 2002 | 4,127 | 1,468 | 481 | 11 | 22 | 6,110 |
| 2003 | 4,174 | 1,479 | 493 | 11 | 24 | 6,181 |
| 2004 | 4,212 | 1,493 | 508 | 11 | 24 | 6,248 |
| 2005 | 4,251 | 1,501 | 516 | 11 | 25 | 6,303 |
| 2006 | 4,407 | 1,353 | 526 | 11 | 25 | 6,323 |
| 2007 | 4,505 | 1,258 | 539 | 11 | 25 | 6,338 |
| 2008 | 4,568 | 1,187 | 548 | 11 | 25 | 6,338 |
| 2009 | 4,628 | 1,146 | 539 | 16 | 24 | 6,353 |
| 2010 | 4,682 | 1,098 | 549 | 16 | 24 | 6,370 |
| 2011 | 4,746 | 1,035 | 556 | 16 | 23 | 6,375 |
| 2012 | 4,828 | 969 | 563 | 15 | 23 | 6,397 |
| 2013 | 4,899 | 967 | 571 | 14 | 23 | 6,474 |
| 2014 | 4,974 | 965 | 580 | 14 | 23 | 6,556 |
| 2015 | 5,047 | 963 | 589 | 14 | 23 | 6,636 |
| 2016 | 5,119 | 961 | 597 | 15 | 23 | 6,715 |
| 2017 | 5,187 | 959 | 605 | 15 | 23 | 6,789 |
| 2018 | 5,250 | 957 | 613 | 15 | 23 | 6,858 |
| 2019 | 5,312 | 955 | 620 | 15 | 23 | 6,925 |
| 2020 | 5,371 | 953 | 628 | 15 | 23 | 6,989 |
| 2021 | 5,429 | 951 | 635 | 15 | 23 | 7,053 |
| 2022 | 5,485 | 949 | 641 | 15 | 23 | 7,113 |
| 2023 | 5,538 | 947 | 648 | 15 | 23 | 7,170 |
| 2024 | 5,590 | 945 | 654 | 15 | 23 | 7,226 |
| 2025 | 5,640 | 943 | 660 | 15 | 23 | 7,281 |
| 2026 | 5,691 | 941 | 666 | 15 | 23 | 7,336 |
| 2027 | 5,740 | 939 | 672 | 15 | 23 | 7,389 |
| 2028 | 5,790 | 937 | 678 | 15 | 23 | 7,442 |
| 2029 | 5,839 | 935 | 683 | 15 | 23 | 7,495 |
| 2030 | 5,888 | 933 | 689 | 15 | 23 | 7,547 |
| 2031 | 5,936 | 931 | 694 | 15 | 23 | 7,599 |
| 2032 | 5,983 | 929 | 700 | 15 | 23 | 7,650 |
| 2033 | 6,032 | 927 | 705 | 15 | 23 | 7,702 |
| 2034 | 6,080 | 925 | 711 | 15 | 23 | 7,754 |
| 2035 | 6,129 | 923 | 716 | 15 | 23 | 7,806 |
| 2036 | 6,179 | 921 | 722 | 15 | 23 | 7,859 |
| 2037 | 6,229 | 919 | 727 | 15 | 23 | 7,913 |
| 2038 | 6,281 | 917 | 733 | 15 | 23 | 7,969 |
| 2039 | 6,335 | 915 | 739 | 15 | 23 | 8,027 |
| 2040 | 6,391 | 913 | 745 | 15 | 23 | 8,087 |
| 2041 | 6,448 | 911 | 751 | 15 | 23 | 8,148 |
| 2042 | 6,505 | 909 | 757 | 15 | 23 | 8,209 |
| Average Annual Growth Rates | | | | | | |
| 1983-2012 | 1.6% | 0.4% | 1.1% | 2.2% | 0.2% | 1.4% |
| 1997-2012 | 1.5% | -1.2% | 1.3% | 3.2% | 1.5% | 1.0% |
| 2002-2012 | 1.6% | -4.1% | 1.6% | 3.2% | 0.3% | 0.5% |
| 2007-2012 | 1.4% | -5.1% | 0.8% | 6.4% | -1.7% | 0.2% |
| 2012-2017 | 1.4% | -0.2% | 1.5% | 0.0% | 0.0% | 1.2% |
| 2012-2022 | 1.3% | -0.2% | 1.3% | 0.0% | 0.0% | 1.1% |
| 2012-2032 | 1.1% | -0.2% | 1.1% | 0.0% | 0.0% | 0.9% |
| 2012-2042 | 1.0% | -0.2% | 1.0% | 0.0% | 0.0% | 0.8% |

Table 3.8

Energy Forecasts By Class (kWh)
North Star Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Total kWh Sales</u> |
|-------------|--------------------|-----------------|---------------------------|-------------------------|------------------------|------------------------|
| 1983 | 36,403,833 | 1,572,570 | 12,818,046 | 10,286,516 | 225,661 | 61,306,626 |
| 1984 | 38,114,542 | 1,686,917 | 13,113,800 | 9,528,326 | 218,942 | 62,662,527 |
| 1985 | 39,131,338 | 1,855,193 | 11,834,069 | 7,422,846 | 174,091 | 60,417,537 |
| 1986 | 38,625,943 | 1,774,166 | 12,071,698 | 5,532,676 | 164,578 | 58,169,061 |
| 1987 | 36,560,043 | 1,983,273 | 12,181,311 | 3,096,036 | 159,174 | 53,979,837 |
| 1988 | 41,214,474 | 2,128,095 | 13,874,099 | 3,773,996 | 162,244 | 61,152,908 |
| 1989 | 44,590,857 | 2,234,641 | 15,157,724 | 3,870,616 | 142,032 | 65,995,870 |
| 1990 | 46,079,922 | 2,166,140 | 15,869,937 | 3,842,116 | 134,590 | 68,092,705 |
| 1991 | 49,132,169 | 1,618,054 | 18,080,340 | 4,136,172 | 125,425 | 73,092,160 |
| 1992 | 50,305,593 | 1,770,740 | 17,638,156 | 5,552,160 | 128,146 | 75,394,795 |
| 1993 | 53,542,320 | 1,803,155 | 17,798,937 | 6,391,620 | 127,280 | 79,663,312 |
| 1994 | 55,196,381 | 1,802,729 | 18,429,533 | 6,169,460 | 126,670 | 81,724,773 |
| 1995 | 58,610,959 | 1,997,953 | 18,531,641 | 7,827,684 | 124,972 | 87,093,209 |
| 1996 | 64,259,100 | 1,904,442 | 18,588,473 | 8,969,478 | 128,341 | 93,849,834 |
| 1997 | 63,228,040 | 2,105,421 | 18,479,496 | 8,885,018 | 126,623 | 92,824,598 |
| 1998 | 60,955,094 | 2,129,011 | 18,089,931 | 9,449,040 | 129,673 | 90,752,749 |
| 1999 | 65,839,511 | 2,217,360 | 18,738,885 | 10,020,590 | 132,028 | 96,948,374 |
| 2000 | 69,562,820 | 2,211,672 | 19,747,332 | 10,445,425 | 135,795 | 102,103,044 |
| 2001 | 72,547,643 | 2,298,729 | 19,999,484 | 10,107,434 | 137,038 | 105,090,328 |
| 2002 | 78,204,417 | 2,415,207 | 20,904,879 | 11,308,044 | 137,034 | 112,969,581 |
| 2003 | 76,716,589 | 2,523,129 | 21,239,849 | 12,871,160 | 152,992 | 113,503,719 |
| 2004 | 77,889,470 | 2,567,701 | 21,550,164 | 14,060,860 | 154,078 | 116,222,723 |
| 2005 | 75,367,605 | 2,658,617 | 21,402,822 | 14,296,080 | 151,524 | 113,876,648 |
| 2006 | 74,812,752 | 2,403,614 | 21,300,024 | 13,796,490 | 151,389 | 112,464,269 |
| 2007 | 75,891,473 | 2,182,987 | 21,414,135 | 13,609,560 | 158,248 | 113,256,403 |
| 2008 | 83,076,023 | 2,052,436 | 22,292,661 | 13,529,460 | 161,765 | 121,112,345 |
| 2009 | 83,193,398 | 2,045,016 | 21,779,751 | 12,446,094 | 157,541 | 119,621,800 |
| 2010 | 75,244,202 | 1,899,812 | 21,084,851 | 10,790,364 | 156,855 | 109,176,084 |
| 2011 | 76,601,120 | 1,723,702 | 21,461,385 | 11,197,456 | 158,327 | 111,141,990 |
| 2012 | 70,422,953 | 1,586,235 | 20,885,302 | 12,092,076 | 151,601 | 105,138,167 |
| 2013 | 74,904,528 | 1,575,046 | 21,715,542 | 12,483,367 | 152,433 | 110,830,915 |
| 2014 | 76,169,630 | 1,563,929 | 22,141,756 | 14,508,002 | 152,433 | 114,535,751 |
| 2015 | 77,139,932 | 1,552,883 | 22,541,609 | 16,532,723 | 152,433 | 117,919,581 |
| 2016 | 78,447,505 | 1,541,909 | 22,870,700 | 20,557,529 | 152,433 | 123,570,076 |
| 2017 | 80,119,617 | 1,531,006 | 23,239,818 | 21,582,420 | 152,433 | 126,625,295 |
| 2018 | 81,428,176 | 1,520,174 | 23,638,227 | 21,607,398 | 152,433 | 128,346,408 |
| 2019 | 82,643,388 | 1,509,411 | 23,985,861 | 21,632,463 | 152,433 | 129,923,555 |
| 2020 | 84,049,545 | 1,498,718 | 24,299,328 | 21,657,614 | 152,433 | 131,657,638 |
| 2021 | 85,660,220 | 1,488,095 | 24,668,831 | 21,682,853 | 152,433 | 133,652,432 |
| 2022 | 86,929,252 | 1,477,540 | 25,083,621 | 21,708,180 | 152,433 | 135,351,026 |
| 2023 | 88,267,095 | 1,467,053 | 25,411,330 | 21,733,594 | 152,433 | 137,031,505 |
| 2024 | 89,536,474 | 1,456,635 | 25,762,915 | 21,759,098 | 152,433 | 138,667,555 |
| 2025 | 90,735,204 | 1,446,284 | 26,098,665 | 21,784,690 | 152,433 | 140,217,276 |
| 2026 | 91,783,099 | 1,435,999 | 26,407,677 | 21,810,372 | 152,433 | 141,589,581 |
| 2027 | 92,820,364 | 1,425,782 | 26,668,878 | 21,836,144 | 152,433 | 142,903,601 |
| 2028 | 93,840,320 | 1,415,631 | 26,932,819 | 21,862,005 | 152,433 | 144,203,208 |
| 2029 | 94,860,713 | 1,405,546 | 27,187,565 | 21,887,958 | 152,433 | 145,494,215 |
| 2030 | 95,880,628 | 1,395,526 | 27,449,110 | 21,914,001 | 152,433 | 146,791,699 |
| 2031 | 96,904,640 | 1,385,571 | 27,699,630 | 21,940,137 | 152,433 | 148,082,411 |
| 2032 | 97,908,269 | 1,375,681 | 27,945,798 | 21,966,364 | 152,433 | 149,348,545 |
| 2033 | 98,947,941 | 1,365,856 | 28,193,249 | 21,992,683 | 152,433 | 150,652,161 |
| 2034 | 99,982,953 | 1,356,094 | 28,442,709 | 22,019,095 | 152,433 | 151,953,283 |
| 2035 | 101,041,150 | 1,346,395 | 28,689,675 | 22,045,601 | 152,433 | 153,275,254 |
| 2036 | 102,118,011 | 1,336,760 | 28,930,814 | 22,072,200 | 152,433 | 154,610,217 |
| 2037 | 103,209,677 | 1,327,187 | 29,186,742 | 22,098,893 | 152,433 | 155,974,933 |
| 2038 | 104,346,061 | 1,317,677 | 29,438,098 | 22,125,681 | 152,433 | 157,379,950 |
| 2039 | 105,505,826 | 1,308,229 | 29,693,672 | 22,152,563 | 152,433 | 158,812,723 |
| 2040 | 106,734,305 | 1,298,842 | 29,962,105 | 22,179,541 | 152,433 | 160,327,226 |
| 2041 | 107,976,099 | 1,289,516 | 30,236,084 | 22,206,615 | 152,433 | 161,860,747 |
| 2042 | 109,231,341 | 1,280,251 | 30,514,585 | 22,233,786 | 152,433 | 163,412,397 |

Average Annual Growth Rates

| | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|
| 1983-2012 | 2.3% | 0.0% | 1.7% | 0.6% | -1.4% | 1.9% |
| 1997-2012 | 1.7% | -0.5% | 0.8% | 4.0% | 0.8% | 1.7% |
| 2002-2012 | -1.0% | -4.1% | 0.0% | 0.7% | 1.0% | -0.7% |
| 2007-2012 | -1.5% | -6.2% | -0.5% | -2.3% | -0.9% | -1.5% |
| 2012-2017 | 2.6% | -0.7% | 2.2% | 12.3% | 0.1% | 3.8% |
| 2012-2022 | 2.1% | -0.7% | 1.8% | 6.0% | 0.1% | 2.6% |
| 2012-2032 | 1.7% | -0.7% | 1.5% | 3.0% | 0.0% | 1.8% |
| 2012-2042 | 1.5% | -0.7% | 1.3% | 2.1% | 0.0% | 1.5% |

Table 3.9

Energy Requirements Forecast (kWh)
North Star Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|-------------|---------------|-------------|-------------|---|
| | Members | and Losses | and Losses | Energy | |
| | <u>kWh</u> | <u>kWh /1</u> | <u>% /1</u> | <u>kWh</u> | |
| 1983 | 61,306,626 | 6,250,334 | 9.3% | 67,556,960 | |
| 1984 | 62,662,527 | 5,994,153 | 8.7% | 68,656,680 | |
| 1985 | 60,417,537 | 7,180,743 | 10.6% | 67,598,280 | |
| 1986 | 58,169,061 | 5,320,049 | 8.4% | 63,489,110 | |
| 1987 | 53,979,837 | 6,220,635 | 10.3% | 60,200,472 | |
| 1988 | 61,152,908 | 6,682,687 | 9.9% | 67,835,595 | |
| 1989 | 65,995,870 | 7,487,983 | 10.2% | 73,483,853 | |
| 1990 | 68,092,705 | 6,103,655 | 8.2% | 74,196,360 | |
| 1991 | 73,092,160 | 7,609,919 | 9.4% | 80,702,079 | |
| 1992 | 75,394,795 | 5,930,247 | 7.3% | 81,325,042 | |
| 1993 | 79,663,312 | 7,228,290 | 8.3% | 86,891,602 | |
| 1994 | 81,724,773 | 7,359,093 | 8.3% | 89,083,866 | |
| 1995 | 87,093,209 | 6,581,546 | 7.0% | 93,674,755 | |
| 1996 | 93,849,834 | 6,227,912 | 6.2% | 100,077,746 | |
| 1997 | 92,824,598 | 8,014,533 | 7.9% | 100,839,131 | |
| 1998 | 90,752,749 | 5,246,542 | 5.5% | 95,999,291 | |
| 1999 | 96,948,374 | 7,503,960 | 7.2% | 104,452,334 | |
| 2000 | 102,103,044 | 7,160,220 | 6.6% | 109,263,264 | |
| 2001 | 105,090,328 | 7,549,680 | 6.7% | 112,640,008 | |
| 2002 | 112,969,581 | 9,884,877 | 8.0% | 122,854,458 | |
| 2003 | 113,503,719 | 9,023,889 | 7.4% | 122,527,608 | |
| 2004 | 116,222,273 | 11,003,057 | 8.6% | 127,225,330 | |
| 2005 | 113,876,648 | 9,488,975 | 7.7% | 123,365,623 | |
| 2006 | 112,464,269 | 8,471,603 | 7.0% | 120,935,872 | |
| 2007 | 113,256,403 | 11,617,084 | 9.3% | 124,873,487 | |
| 2008 | 121,112,345 | 8,985,633 | 6.9% | 130,097,978 | |
| 2009 | 119,621,800 | 8,170,021 | 6.4% | 127,791,821 | |
| 2010 | 109,176,084 | 7,850,223 | 6.7% | 117,026,307 | |
| 2011 | 111,141,990 | 7,830,545 | 6.6% | 118,972,535 | 129,793,552 |
| 2012 | 105,138,167 | 7,804,145 | 6.9% | 112,942,312 | 133,291,383 |
| 2013 | 110,830,915 | 7,958,865 | 6.7% | 118,789,781 | 137,812,753 |
| 2014 | 114,535,751 | 8,224,913 | 6.7% | 122,760,664 | 142,428,636 |
| 2015 | 117,919,581 | 8,467,909 | 6.7% | 126,387,489 | 143,780,748 |
| 2016 | 123,570,076 | 8,873,676 | 6.7% | 132,443,752 | 145,172,907 |
| 2017 | 126,625,295 | 9,093,074 | 6.7% | 135,718,369 | 146,698,213 |
| 2018 | 128,346,408 | 9,216,668 | 6.7% | 137,563,077 | 148,271,016 |
| 2019 | 129,923,555 | 9,329,925 | 6.7% | 139,253,480 | 149,832,908 |
| 2020 | 131,657,638 | 9,454,451 | 6.7% | 141,112,089 | 151,399,218 |
| 2021 | 133,652,432 | 9,597,699 | 6.7% | 143,250,131 | 153,259,140 |
| 2022 | 135,351,026 | 9,719,676 | 6.7% | 145,070,702 | 155,145,545 |
| 2023 | 137,031,505 | 9,840,353 | 6.7% | 146,871,858 | 156,767,961 |
| 2024 | 138,667,555 | 9,957,839 | 6.7% | 148,625,394 | 158,185,505 |
| 2025 | 140,217,276 | 10,069,126 | 6.7% | 150,286,402 | 159,540,094 |
| 2026 | 141,589,581 | 10,167,672 | 6.7% | 151,757,253 | 160,869,938 |
| 2027 | 142,903,601 | 10,262,033 | 6.7% | 153,165,634 | 162,177,643 |
| 2028 | 144,203,208 | 10,355,359 | 6.7% | 154,558,567 | 163,455,702 |
| 2029 | 145,494,215 | 10,448,068 | 6.7% | 155,942,283 | 164,704,595 |
| 2030 | 146,791,699 | 10,541,241 | 6.7% | 157,332,940 | 165,945,475 |
| 2031 | 148,082,411 | 10,633,928 | 6.7% | 158,716,339 | 167,125,575 |
| 2032 | 149,348,545 | 10,724,850 | 6.7% | 160,073,396 | 168,304,414 |
| 2033 | 150,652,161 | 10,818,464 | 6.7% | 161,470,626 | 169,456,591 |
| 2034 | 151,953,283 | 10,911,899 | 6.7% | 162,865,182 | 170,590,746 |
| 2035 | 153,275,254 | 11,006,831 | 6.7% | 164,282,085 | 171,708,355 |
| 2036 | 154,610,217 | 11,102,696 | 6.7% | 165,712,913 | 172,806,347 |
| 2037 | 155,974,933 | 11,200,697 | 6.7% | 167,175,630 | 173,867,123 |
| 2038 | 157,379,950 | 11,301,593 | 6.7% | 168,681,542 | 174,919,103 |
| 2039 | 158,812,723 | 11,404,481 | 6.7% | 170,217,204 | 175,962,423 |
| 2040 | 160,327,226 | 11,513,239 | 6.7% | 171,840,465 | 176,967,384 |
| 2041 | 161,860,747 | 11,623,363 | 6.7% | 173,484,110 | |
| 2042 | 163,412,397 | 11,734,788 | 6.7% | 175,147,184 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 1.9% | 0.8% | | 1.8% | -- |
| 1997-2012 | 1.7% | 1.4% | | 1.7% | -- |
| 2002-2012 | -0.7% | -2.3% | | -0.8% | -- |
| 2007-2012 | -1.5% | -7.6% | | -2.0% | -- |
| 2012-2017 | 3.8% | 3.1% | | 3.7% | 1.9% |
| 2012-2022 | 2.6% | 2.2% | | 2.5% | 1.5% |
| 2012-2032 | 1.8% | 1.6% | | 1.8% | 1.2% |
| 2012-2042 | 1.5% | 1.4% | | 1.5% | |

/1 Distribution losses

Table 3.7

Member Forecasts By Class
PKM Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Resale Other</u> | <u>Total Members</u> |
|------------------------------------|--------------------|-------------------|---------------------------|-------------------------|---------------------|----------------------|
| 1983 | 3,594 | 11 | 177 | - | 2 | 3,785 |
| 1984 | 3,575 | 11 | 177 | - | 2 | 3,765 |
| 1985 | 3,555 | 11 | 182 | - | 2 | 3,750 |
| 1986 | 3,559 | 10 | 183 | - | 2 | 3,754 |
| 1987 | 3,545 | 7 | 185 | - | 2 | 3,739 |
| 1988 | 3,555 | 5 | 189 | - | 2 | 3,751 |
| 1989 | 3,531 | 5 | 191 | - | 2 | 3,729 |
| 1990 | 3,494 | 5 | 198 | - | 2 | 3,698 |
| 1991 | 3,478 | 7 | 207 | - | 2 | 3,694 |
| 1992 | 3,473 | 9 | 206 | - | 2 | 3,690 |
| 1993 | 3,482 | 9 | 211 | - | 3 | 3,705 |
| 1994 | 3,479 | 10 | 216 | - | 3 | 3,707 |
| 1995 | 3,478 | 9 | 219 | - | 3 | 3,709 |
| 1996 | 3,474 | 14 | 218 | 1 | 3 | 3,710 |
| 1997 | 3,453 | 16 | 219 | 1 | 3 | 3,692 |
| 1998 | 3,421 | 16 | 215 | 1 | 3 | 3,655 |
| 1999 | 3,407 | 15 | 216 | 1 | 3 | 3,642 |
| 2000 | 3,396 | 14 | 219 | 1 | 2 | 3,632 |
| 2001 | 3,370 | 13 | 222 | 1 | 2 | 3,609 |
| 2002 | 3,367 | 12 | 222 | 1 | 2 | 3,604 |
| 2003 | 3,365 | 12 | 225 | 1 | 2 | 3,606 |
| 2004 | 3,359 | 13 | 231 | 1 | 2 | 3,606 |
| 2005 | 3,378 | 13 | 240 | 1 | 2 | 3,635 |
| 2006 | 3,342 | 15 | 243 | 1 | 2 | 3,603 |
| 2007 | 3,340 | 19 | 247 | 1 | 2 | 3,608 |
| 2008 | 3,339 | 21 | 249 | 1 | 2 | 3,612 |
| 2009 | 3,331 | 24 | 254 | 1 | 2 | 3,612 |
| 2010 | 3,323 | 25 | 260 | 1 | 2 | 3,611 |
| 2011 | 3,334 | 25 | 265 | 1 | 2 | 3,627 |
| 2012 | 3,373 | 26 | 263 | 2 | 2 | 3,666 |
| 2013 | 3,393 | 27 | 263 | 2 | 2 | 3,687 |
| 2014 | 3,413 | 27 | 264 | 2 | 2 | 3,708 |
| 2015 | 3,433 | 28 | 265 | 2 | 2 | 3,729 |
| 2016 | 3,453 | 28 | 266 | 2 | 2 | 3,750 |
| 2017 | 3,473 | 29 | 267 | 2 | 2 | 3,772 |
| 2018 | 3,493 | 29 | 268 | 2 | 2 | 3,793 |
| 2019 | 3,513 | 30 | 269 | 2 | 2 | 3,816 |
| 2020 | 3,533 | 30 | 270 | 2 | 2 | 3,837 |
| 2021 | 3,553 | 31 | 271 | 2 | 2 | 3,859 |
| 2022 | 3,573 | 31 | 273 | 2 | 2 | 3,880 |
| 2023 | 3,593 | 32 | 274 | 2 | 2 | 3,903 |
| 2024 | 3,613 | 32 | 275 | 2 | 2 | 3,924 |
| 2025 | 3,633 | 33 | 277 | 2 | 2 | 3,946 |
| 2026 | 3,653 | 33 | 278 | 2 | 2 | 3,968 |
| 2027 | 3,673 | 34 | 280 | 2 | 2 | 3,990 |
| 2028 | 3,693 | 34 | 281 | 2 | 2 | 4,012 |
| 2029 | 3,713 | 35 | 283 | 2 | 2 | 4,034 |
| 2030 | 3,733 | 35 | 284 | 2 | 2 | 4,056 |
| 2031 | 3,753 | 36 | 286 | 2 | 2 | 4,078 |
| 2032 | 3,773 | 36 | 287 | 2 | 2 | 4,100 |
| 2033 | 3,793 | 37 | 289 | 2 | 2 | 4,123 |
| 2034 | 3,813 | 37 | 291 | 2 | 2 | 4,144 |
| 2035 | 3,833 | 38 | 292 | 2 | 2 | 4,167 |
| 2036 | 3,853 | 38 | 294 | 2 | 2 | 4,189 |
| 2037 | 3,873 | 39 | 296 | 2 | 2 | 4,211 |
| 2038 | 3,893 | 39 | 297 | 2 | 2 | 4,233 |
| 2039 | 3,913 | 40 | 299 | 2 | 2 | 4,256 |
| 2040 | 3,933 | 40 | 301 | 2 | 2 | 4,278 |
| 2041 | 3,953 | 41 | 303 | 2 | 2 | 4,301 |
| 2042 | 3,973 | 41 | 305 | 2 | 2 | 4,322 |
| Average Annual Growth Rates | | | | | | |
| 1983-2012 | -0.2% | 3.0% | 1.4% | -- | 0.0% | -0.1% |
| 1997-2012 | -0.1% | 5.6% | 1.2% | -- | 0.0% | 0.0% |
| 2002-2012 | 0.0% | 7.9% | 1.7% | 7.2% | 0.0% | 0.2% |
| 2007-2012 | 0.2% | 6.8% | 1.3% | 14.9% | 0.0% | 0.3% |
| 2012-2017 | 0.6% | 2.2% | 0.3% | 0.0% | 0.0% | 0.6% |
| 2012-2022 | 0.6% | 1.8% | 0.4% | 0.0% | 0.0% | 0.6% |
| 2012-2032 | 0.6% | 1.6% | 0.4% | 0.0% | 0.0% | 0.6% |
| 2012-2042 | 0.5% | 1.5% | 0.5% | 0.0% | 0.0% | 0.6% |

Table 3.8

Energy Forecasts By Class (kWh)
PKM Electric Cooperative, Inc.

| Year | Residential | Irrigation | General Commercial | Large Commercial | Resale Other | Total kWh Sales |
|------|-------------|------------|--------------------|------------------|--------------|-----------------|
| 1983 | 65,136,899 | 123,518 | 4,841,656 | - | 5,036,950 | 75,139,023 |
| 1984 | 66,891,843 | 232,534 | 4,936,372 | - | 5,417,850 | 77,478,599 |
| 1985 | 69,387,164 | 7,740 | 5,051,363 | - | 5,720,561 | 80,166,828 |
| 1986 | 69,744,594 | 123,861 | 5,201,085 | - | 4,453,331 | 79,522,871 |
| 1987 | 63,509,866 | 90,034 | 5,325,512 | - | 3,010,620 | 71,936,032 |
| 1988 | 66,728,680 | 79,010 | 5,856,043 | - | 3,136,640 | 75,800,373 |
| 1989 | 67,310,949 | 80,020 | 5,816,580 | - | 3,128,540 | 76,336,089 |
| 1990 | 66,367,923 | 80,720 | 6,660,086 | - | 3,462,500 | 76,571,229 |
| 1991 | 68,204,463 | 92,050 | 7,721,334 | - | 3,372,010 | 79,389,857 |
| 1992 | 68,719,437 | 164,772 | 9,356,549 | - | 3,382,200 | 81,622,958 |
| 1993 | 72,503,471 | 119,703 | 8,680,427 | - | 7,925,624 | 89,229,225 |
| 1994 | 69,574,786 | 103,699 | 8,366,996 | - | 13,996,862 | 92,042,343 |
| 1995 | 72,464,476 | 53,003 | 11,913,460 | - | 12,023,898 | 96,454,837 |
| 1996 | 77,473,000 | 144,108 | 7,847,670 | 1,600,000 | 16,846,092 | 103,910,870 |
| 1997 | 73,977,239 | 178,420 | 8,444,978 | 1,600,000 | 14,219,926 | 98,420,563 |
| 1998 | 63,577,835 | 276,828 | 8,791,155 | 1,600,000 | 17,391,424 | 91,637,242 |
| 1999 | 66,942,787 | 317,178 | 11,611,543 | 1,600,000 | 18,391,375 | 98,862,883 |
| 2000 | 68,907,576 | 63,149 | 11,006,077 | 1,600,000 | 5,732,467 | 87,309,269 |
| 2001 | 70,908,808 | 345,931 | 11,004,784 | 1,600,000 | 4,627,735 | 88,487,258 |
| 2002 | 70,449,782 | 226,833 | 10,822,823 | 1,600,000 | 5,690,734 | 88,790,172 |
| 2003 | 69,806,703 | 243,438 | 11,467,919 | 1,600,000 | 6,135,252 | 89,253,312 |
| 2004 | 71,743,873 | 452,691 | 12,472,007 | 1,600,000 | 6,839,941 | 93,108,512 |
| 2005 | 68,740,396 | 164,050 | 12,572,244 | 1,566,666 | 6,873,876 | 89,917,232 |
| 2006 | 66,811,349 | 375,744 | 11,798,667 | 1,696,182 | 6,818,418 | 87,500,360 |
| 2007 | 76,419,672 | 457,858 | 15,024,460 | 1,648,921 | 7,069,980 | 100,620,891 |
| 2008 | 69,140,705 | 517,129 | 15,299,647 | 1,784,665 | 6,405,175 | 93,147,321 |
| 2009 | 80,513,191 | 438,982 | 15,506,248 | 1,327,646 | 7,150,318 | 104,936,385 |
| 2010 | 75,575,422 | 827,949 | 19,451,975 | 1,634,597 | 12,194,424 | 109,684,367 |
| 2011 | 73,444,870 | 616,234 | 19,715,368 | 1,584,817 | 13,510,825 | 108,872,114 |
| 2012 | 74,363,803 | 894,668 | 13,300,636 | 11,157,029 | 15,000,932 | 114,717,068 |
| 2013 | 77,670,627 | 733,224 | 18,072,709 | 16,950,000 | 15,075,937 | 128,502,496 |
| 2014 | 76,955,421 | 733,224 | 18,139,680 | 16,950,000 | 15,151,316 | 127,929,641 |
| 2015 | 77,285,820 | 760,464 | 18,246,713 | 16,950,000 | 15,227,073 | 128,470,070 |
| 2016 | 77,608,092 | 760,464 | 18,331,823 | 16,950,000 | 15,303,208 | 128,953,588 |
| 2017 | 77,951,469 | 787,705 | 18,454,996 | 16,950,000 | 15,379,724 | 129,523,894 |
| 2018 | 78,342,498 | 787,705 | 18,599,167 | 16,950,000 | 15,456,623 | 130,135,993 |
| 2019 | 78,804,417 | 814,945 | 18,748,419 | 16,950,000 | 15,533,906 | 130,851,688 |
| 2020 | 79,263,794 | 814,945 | 18,865,076 | 16,950,000 | 15,611,576 | 131,505,390 |
| 2021 | 79,737,321 | 842,186 | 19,036,831 | 16,950,000 | 15,689,633 | 132,255,972 |
| 2022 | 80,275,652 | 842,186 | 19,143,211 | 16,950,000 | 15,768,082 | 132,979,130 |
| 2023 | 80,822,109 | 869,426 | 19,306,812 | 16,950,000 | 15,846,922 | 133,795,269 |
| 2024 | 81,294,741 | 869,426 | 19,478,750 | 16,950,000 | 15,926,157 | 134,519,073 |
| 2025 | 81,891,683 | 896,667 | 19,602,421 | 16,950,000 | 16,005,787 | 135,346,558 |
| 2026 | 82,526,409 | 896,667 | 19,726,541 | 16,950,000 | 16,085,816 | 136,185,433 |
| 2027 | 83,082,744 | 923,907 | 19,863,015 | 16,950,000 | 16,166,245 | 136,985,911 |
| 2028 | 83,696,113 | 923,907 | 20,037,792 | 16,950,000 | 16,247,077 | 137,854,889 |
| 2029 | 84,262,833 | 951,148 | 20,243,864 | 16,950,000 | 16,328,312 | 138,736,158 |
| 2030 | 84,880,715 | 951,148 | 20,372,473 | 16,950,000 | 16,409,954 | 139,564,290 |
| 2031 | 85,501,252 | 978,388 | 20,533,722 | 16,950,000 | 16,492,003 | 140,455,366 |
| 2032 | 86,074,191 | 978,388 | 20,711,245 | 16,950,000 | 16,574,463 | 141,288,288 |
| 2033 | 86,699,122 | 1,005,629 | 20,875,419 | 16,950,000 | 16,657,336 | 142,187,506 |
| 2034 | 87,406,882 | 1,005,629 | 21,027,010 | 16,950,000 | 16,740,622 | 143,130,143 |
| 2035 | 87,969,841 | 1,032,869 | 21,219,053 | 16,950,000 | 16,824,326 | 143,996,088 |
| 2036 | 88,619,725 | 1,032,869 | 21,376,272 | 16,950,000 | 16,908,447 | 144,887,314 |
| 2037 | 89,255,802 | 1,060,110 | 21,585,683 | 16,950,000 | 16,992,989 | 145,844,585 |
| 2038 | 89,825,863 | 1,060,110 | 21,763,559 | 16,950,000 | 17,077,954 | 146,677,486 |
| 2039 | 90,481,765 | 1,087,350 | 22,006,560 | 16,950,000 | 17,163,344 | 147,689,019 |
| 2040 | 91,055,860 | 1,087,350 | 22,170,634 | 16,950,000 | 17,249,161 | 148,513,006 |
| 2041 | 91,630,177 | 1,114,591 | 22,332,512 | 16,950,000 | 17,335,407 | 149,362,687 |
| 2042 | 92,204,674 | 1,114,591 | 22,492,481 | 16,950,000 | 17,422,084 | 150,183,830 |

Average Annual Growth Rates

| | | | | | | |
|-----------|-------|-------|-------|-------|-------|------|
| 1983-2012 | 0.5% | 7.1% | 3.5% | -- | 3.8% | 1.5% |
| 1997-2012 | 0.4% | 8.8% | 1.8% | -- | 7.7% | 1.7% |
| 2002-2012 | 0.5% | 14.7% | 2.1% | 21.4% | 10.2% | 2.6% |
| 2007-2012 | -0.5% | 14.3% | -2.4% | 46.6% | 16.2% | 2.7% |
| 2012-2017 | 0.9% | -2.5% | 6.8% | 8.7% | 0.5% | 2.5% |
| 2012-2022 | 0.8% | -0.6% | 3.7% | 4.3% | 0.5% | 1.5% |
| 2012-2032 | 0.7% | 0.4% | 2.2% | 2.1% | 0.5% | 1.0% |
| 2012-2042 | 0.7% | 0.7% | 1.8% | 1.4% | 0.5% | 0.9% |

Table 3.9

Energy Requirements Forecast (kWh)

PKM Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|----------------|----------------------|-------------------|---------------|---|
| | Members kWh | and Losses kWh /1 | and Losses %/1 | Energy kWh | |
| 1983 | 75,139,023 | 5,691,857 | 7.0% | 80,830,880 | |
| 1984 | 77,478,599 | 5,424,951 | 6.5% | 82,903,550 | |
| 1985 | 80,166,828 | 7,284,932 | 8.3% | 87,451,760 | |
| 1986 | 79,522,871 | 4,663,849 | 5.5% | 84,186,720 | |
| 1987 | 71,936,032 | 4,742,888 | 6.2% | 76,678,920 | |
| 1988 | 75,800,373 | 4,672,107 | 5.8% | 80,472,480 | |
| 1989 | 76,336,089 | 8,324,271 | 9.8% | 84,660,360 | |
| 1990 | 76,571,229 | 3,585,531 | 4.5% | 80,156,760 | |
| 1991 | 79,389,857 | 6,388,783 | 7.4% | 85,778,640 | |
| 1992 | 81,622,958 | 6,757,834 | 7.6% | 88,380,792 | |
| 1993 | 89,229,225 | 4,920,779 | 5.2% | 94,150,004 | |
| 1994 | 92,042,343 | 7,743,752 | 7.8% | 99,786,095 | |
| 1995 | 96,454,837 | 6,958,246 | 6.7% | 103,413,083 | |
| 1996 | 103,910,870 | 6,585,638 | 6.0% | 110,496,508 | |
| 1997 | 98,420,563 | 4,267,006 | 4.2% | 102,687,569 | |
| 1998 | 91,637,242 | 6,118,950 | 6.3% | 97,756,192 | |
| 1999 | 98,862,883 | 6,014,259 | 5.7% | 104,877,142 | |
| 2000 | 87,309,269 | 6,101,253 | 6.5% | 93,410,522 | |
| 2001 | 88,487,258 | 2,471,954 | 2.7% | 90,959,212 | |
| 2002 | 88,790,172 | 9,046,628 | 9.2% | 97,836,800 | |
| 2003 | 89,253,312 | 6,463,717 | 6.8% | 95,717,029 | |
| 2004 | 93,108,512 | 9,117,540 | 8.9% | 102,226,052 | |
| 2005 | 89,917,232 | 8,386,141 | 8.5% | 98,303,373 | |
| 2006 | 87,500,360 | 6,201,274 | 6.6% | 93,701,634 | |
| 2007 | 100,620,891 | 5,117,944 | 4.8% | 105,738,835 | |
| 2008 | 93,147,321 | 16,001,919 | 14.7% | 109,149,240 | |
| 2009 | 104,936,385 | 10,521,481 | 9.1% | 115,457,866 | |
| 2010 | 109,684,367 | 2,419,479 | 2.2% | 112,103,846 | |
| 2011 | 108,872,114 | 7,183,929 | 6.2% | 116,056,043 | 126,619,513 |
| 2012 | 114,717,068 | 6,037,741 | 5.0% | 120,754,809 | 145,103,624 |
| 2013 | 128,502,496 | 8,933,329 | 6.5% | 137,435,825 | 145,200,249 |
| 2014 | 127,929,641 | 8,893,504 | 6.5% | 136,823,145 | 145,919,286 |
| 2015 | 128,470,070 | 8,931,074 | 6.5% | 137,401,144 | 146,308,197 |
| 2016 | 128,953,588 | 8,964,688 | 6.5% | 137,918,276 | 146,894,809 |
| 2017 | 129,523,894 | 9,004,335 | 6.5% | 138,528,229 | 147,688,185 |
| 2018 | 130,135,993 | 9,046,887 | 6.5% | 139,182,880 | 148,612,742 |
| 2019 | 130,851,688 | 9,096,641 | 6.5% | 139,948,329 | 149,616,993 |
| 2020 | 131,505,390 | 9,142,086 | 6.5% | 140,647,476 | 150,672,392 |
| 2021 | 132,255,972 | 9,194,265 | 6.5% | 141,450,237 | 152,217,351 |
| 2022 | 132,979,130 | 9,244,538 | 6.5% | 142,223,668 | 153,876,781 |
| 2023 | 133,795,269 | 9,301,275 | 6.5% | 143,096,544 | 155,712,459 |
| 2024 | 134,519,073 | 9,351,593 | 6.5% | 143,870,667 | 157,033,287 |
| 2025 | 135,346,558 | 9,409,119 | 6.5% | 144,755,677 | 158,313,803 |
| 2026 | 136,185,433 | 9,467,437 | 6.5% | 145,652,870 | 159,468,897 |
| 2027 | 136,985,911 | 9,523,085 | 6.5% | 146,508,996 | 160,613,080 |
| 2028 | 137,854,889 | 9,583,495 | 6.5% | 147,438,384 | 161,777,554 |
| 2029 | 138,736,158 | 9,644,760 | 6.5% | 148,380,917 | 162,969,315 |
| 2030 | 139,564,290 | 9,702,330 | 6.5% | 149,266,620 | 164,238,491 |
| 2031 | 140,455,366 | 9,764,277 | 6.5% | 150,219,643 | 165,532,330 |
| 2032 | 141,288,288 | 9,822,180 | 6.5% | 151,110,468 | 166,757,142 |
| 2033 | 142,187,506 | 9,884,693 | 6.5% | 152,072,198 | 168,170,069 |
| 2034 | 143,130,143 | 9,950,224 | 6.5% | 153,080,367 | 169,399,137 |
| 2035 | 143,996,088 | 10,010,423 | 6.5% | 154,006,511 | 170,833,798 |
| 2036 | 144,887,314 | 10,072,380 | 6.5% | 154,959,694 | 172,283,130 |
| 2037 | 145,844,585 | 10,138,928 | 6.5% | 155,983,513 | 173,658,428 |
| 2038 | 146,677,486 | 10,196,831 | 6.5% | 156,874,317 | 175,131,171 |
| 2039 | 147,689,019 | 10,267,151 | 6.5% | 157,956,170 | 176,760,854 |
| 2040 | 148,513,006 | 10,324,434 | 6.5% | 158,837,439 | 178,199,521 |
| 2041 | 149,362,687 | 10,383,502 | 6.5% | 159,746,189 | |
| 2042 | 150,183,830 | 10,440,587 | 6.5% | 160,624,417 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 1.5% | 0.2% | | 1.4% | -- |
| 1997-2012 | 1.7% | -0.6% | | 1.6% | -- |
| 2002-2012 | 2.6% | -4.0% | | 2.1% | -- |
| 2007-2012 | 2.7% | 3.4% | | 2.7% | -- |
| 2012-2017 | 2.5% | 8.3% | | 2.8% | 0.4% |
| 2012-2022 | 1.5% | 4.4% | | 1.6% | 0.6% |
| 2012-2032 | 1.0% | 2.5% | | 1.1% | 0.7% |
| 2012-2042 | 0.9% | 1.8% | | 1.0% | |

/1 Distribution losses

Table 3.8

Member Forecasts By Class
Red Lake Electric Cooperative, Inc.

| Year | Residential | Irrigation | General Commercial | Large Commercial | Street Lighting | Resale Other | Total Members |
|-------------|--------------------|-------------------|---------------------------|-------------------------|------------------------|---------------------|----------------------|
| 1983 | 4,561 | - | 231 | - | 2 | - | 4,794 |
| 1984 | 4,551 | - | 231 | - | 2 | - | 4,784 |
| 1985 | 4,502 | - | 239 | - | 2 | - | 4,743 |
| 1986 | 4,473 | - | 243 | - | 2 | - | 4,717 |
| 1987 | 4,448 | - | 242 | - | 2 | - | 4,692 |
| 1988 | 4,433 | - | 242 | - | 2 | - | 4,677 |
| 1989 | 4,430 | - | 242 | - | 2 | - | 4,673 |
| 1990 | 4,422 | - | 242 | - | 2 | - | 4,666 |
| 1991 | 4,425 | 9 | 239 | - | 2 | - | 4,674 |
| 1992 | 4,420 | 12 | 239 | - | 2 | - | 4,673 |
| 1993 | 4,444 | 12 | 243 | 1 | 2 | - | 4,701 |
| 1994 | 4,446 | 12 | 238 | 1 | 2 | - | 4,699 |
| 1995 | 4,465 | 12 | 239 | 1 | 2 | - | 4,719 |
| 1996 | 4,493 | 12 | 243 | 1 | 2 | - | 4,751 |
| 1997 | 4,496 | 12 | 248 | 1 | 2 | - | 4,759 |
| 1998 | 4,507 | 12 | 271 | 1 | 2 | - | 4,793 |
| 1999 | 4,518 | 13 | 276 | 2 | 2 | - | 4,811 |
| 2000 | 4,524 | 13 | 286 | 2 | 2 | - | 4,827 |
| 2001 | 4,532 | 11 | 297 | 3 | 4 | - | 4,848 |
| 2002 | 4,551 | 11 | 305 | 3 | 4 | - | 4,875 |
| 2003 | 4,586 | 11 | 315 | 3 | 4 | - | 4,919 |
| 2004 | 4,628 | 11 | 325 | 3 | 4 | - | 4,971 |
| 2005 | 4,644 | 11 | 335 | 3 | 4 | - | 4,997 |
| 2006 | 4,674 | 11 | 338 | 3 | 4 | - | 5,030 |
| 2007 | 4,710 | 11 | 343 | 5 | 4 | - | 5,073 |
| 2008 | 4,747 | 11 | 353 | 5 | 4 | 1 | 5,121 |
| 2009 | 4,792 | 11 | 354 | 6 | 4 | 1 | 5,168 |
| 2010 | 4,827 | 11 | 352 | 6 | 4 | 1 | 5,200 |
| 2011 | 4,835 | 11 | 346 | 5 | 5 | 1 | 5,203 |
| 2012 | 4,839 | 12 | 352 | 5 | 9 | 1 | 5,218 |
| 2013 | 4,844 | 12 | 355 | 5 | 9 | 1 | 5,226 |
| 2014 | 4,851 | 12 | 358 | 5 | 9 | 1 | 5,236 |
| 2015 | 4,861 | 12 | 361 | 5 | 9 | 1 | 5,249 |
| 2016 | 4,876 | 12 | 366 | 5 | 9 | 1 | 5,269 |
| 2017 | 4,891 | 12 | 371 | 5 | 9 | 1 | 5,289 |
| 2018 | 4,906 | 12 | 376 | 5 | 9 | 1 | 5,309 |
| 2019 | 4,921 | 12 | 381 | 5 | 9 | 1 | 5,329 |
| 2020 | 4,936 | 12 | 386 | 5 | 9 | 1 | 5,349 |
| 2021 | 4,951 | 12 | 391 | 5 | 9 | 1 | 5,369 |
| 2022 | 4,966 | 12 | 396 | 6 | 9 | 1 | 5,390 |
| 2023 | 4,981 | 12 | 401 | 6 | 9 | 1 | 5,410 |
| 2024 | 4,996 | 12 | 406 | 6 | 9 | 1 | 5,430 |
| 2025 | 5,011 | 12 | 411 | 6 | 9 | 1 | 5,450 |
| 2026 | 5,026 | 12 | 416 | 6 | 9 | 1 | 5,470 |
| 2027 | 5,041 | 12 | 421 | 6 | 9 | 1 | 5,490 |
| 2028 | 5,056 | 12 | 426 | 6 | 9 | 1 | 5,510 |
| 2029 | 5,071 | 12 | 431 | 6 | 9 | 1 | 5,530 |
| 2030 | 5,086 | 12 | 436 | 6 | 9 | 1 | 5,550 |
| 2031 | 5,101 | 12 | 441 | 6 | 9 | 1 | 5,570 |
| 2032 | 5,116 | 12 | 446 | 7 | 9 | 1 | 5,591 |
| 2033 | 5,131 | 12 | 451 | 7 | 9 | 1 | 5,611 |
| 2034 | 5,146 | 12 | 456 | 7 | 9 | 1 | 5,631 |
| 2035 | 5,161 | 12 | 461 | 7 | 9 | 1 | 5,651 |
| 2036 | 5,176 | 12 | 466 | 7 | 9 | 1 | 5,671 |
| 2037 | 5,191 | 12 | 471 | 7 | 9 | 1 | 5,691 |
| 2038 | 5,206 | 12 | 476 | 7 | 9 | 1 | 5,711 |
| 2039 | 5,221 | 12 | 481 | 7 | 9 | 1 | 5,731 |
| 2040 | 5,236 | 12 | 486 | 7 | 9 | 1 | 5,751 |
| 2041 | 5,251 | 12 | 491 | 7 | 9 | 1 | 5,771 |
| 2042 | 5,266 | 12 | 496 | 7 | 9 | 1 | 5,791 |

| Average Annual Growth Rates | | | | | | | |
|-----------------------------|------|------|------|------|-------|------|------|
| 1983-2012 | 0.2% | -- | 1.5% | -- | 5.3% | -- | 0.3% |
| 1997-2012 | 0.5% | 0.0% | 2.0% | -- | 7.8% | -- | 0.6% |
| 2002-2012 | 0.6% | 1.0% | 1.4% | 5.2% | 8.4% | -- | 0.7% |
| 2007-2012 | 0.5% | 2.0% | 0.6% | 0.0% | 17.6% | -- | 0.6% |
| 2012-2017 | 0.2% | 0.0% | 1.1% | 0.0% | 0.0% | 0.0% | 0.3% |
| 2012-2022 | 0.3% | 0.0% | 1.2% | 1.8% | 0.0% | 0.0% | 0.3% |
| 2012-2032 | 0.3% | 0.0% | 1.2% | 1.7% | 0.0% | 0.0% | 0.3% |
| 2012-2042 | 0.3% | 0.0% | 1.1% | 1.1% | 0.0% | 0.0% | 0.3% |

Table 3.9

Energy Forecasts By Class (kWh)
Red Lake Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Resale Other</u> | <u>Total kWh Sales</u> |
|------------------------------------|--------------------|-------------------|---------------------------|-------------------------|------------------------|---------------------|------------------------|
| 1983 | 77,236,275 | - | 7,766,063 | - | 25,270 | - | 85,027,608 |
| 1984 | 80,089,962 | - | 7,361,686 | - | 26,040 | - | 87,477,688 |
| 1985 | 81,889,248 | - | 7,864,585 | - | 26,040 | - | 89,779,873 |
| 1986 | 81,728,314 | - | 8,271,571 | - | 26,040 | - | 90,025,925 |
| 1987 | 74,439,393 | - | 7,639,591 | - | 25,770 | - | 82,104,754 |
| 1988 | 79,329,986 | - | 8,375,828 | - | 25,530 | - | 87,731,344 |
| 1989 | 82,295,308 | - | 8,660,056 | - | 25,050 | - | 90,980,414 |
| 1990 | 80,968,949 | - | 8,996,744 | - | 24,840 | - | 89,990,533 |
| 1991 | 82,893,355 | 240,278 | 10,070,842 | - | 26,930 | - | 93,231,405 |
| 1992 | 82,652,923 | 279,263 | 9,466,979 | - | 25,080 | - | 92,424,245 |
| 1993 | 87,047,564 | 290,786 | 10,829,854 | 992,100 | 25,045 | - | 99,185,349 |
| 1994 | 86,012,433 | 176,521 | 11,266,053 | 1,387,700 | 24,410 | - | 98,867,117 |
| 1995 | 87,731,623 | 136,266 | 11,751,770 | 1,715,700 | 24,470 | - | 101,359,829 |
| 1996 | 95,239,482 | 282,871 | 11,665,070 | 1,814,100 | 24,930 | - | 109,026,453 |
| 1997 | 93,782,464 | 192,435 | 11,931,059 | 1,814,100 | 24,840 | - | 107,744,898 |
| 1998 | 83,002,034 | 306,024 | 12,328,889 | 1,703,000 | 25,560 | - | 97,365,507 |
| 1999 | 85,964,030 | 361,205 | 12,445,238 | 2,218,200 | 25,800 | - | 101,014,473 |
| 2000 | 86,132,678 | 538,597 | 12,413,337 | 4,085,040 | 25,800 | - | 103,195,452 |
| 2001 | 97,899,818 | 278,541 | 12,997,942 | 7,182,125 | 27,869 | - | 118,386,295 |
| 2002 | 95,202,341 | 346,792 | 12,921,141 | 8,908,235 | 26,289 | - | 117,404,798 |
| 2003 | 92,630,443 | 344,179 | 13,308,434 | 8,616,460 | 24,383 | - | 114,923,899 |
| 2004 | 93,826,482 | 372,295 | 12,618,067 | 8,169,860 | 16,415 | - | 115,003,119 |
| 2005 | 94,770,361 | 247,147 | 13,842,687 | 7,840,499 | 12,332 | - | 116,713,026 |
| 2006 | 93,700,347 | 145,843 | 13,107,411 | 8,628,882 | 13,031 | - | 115,595,514 |
| 2007 | 97,785,013 | 391,216 | 12,761,355 | 11,094,514 | 12,617 | - | 122,044,715 |
| 2008 | 102,602,113 | 262,881 | 13,128,765 | 11,918,103 | 12,817 | 2,908,200 | 130,832,879 |
| 2009 | 107,266,908 | 234,908 | 13,887,949 | 10,458,210 | 12,196 | 2,703,191 | 134,563,362 |
| 2010 | 97,499,904 | 237,580 | 14,267,774 | 11,719,000 | 11,704 | 5,952,050 | 129,688,012 |
| 2011 | 99,253,333 | 217,913 | 13,740,898 | 12,037,494 | 11,267 | 8,055,650 | 133,316,555 |
| 2012 | 88,747,532 | 238,292 | 13,014,090 | 11,742,161 | 24,336 | 8,929,850 | 122,696,261 |
| 2013 | 99,066,480 | 258,536 | 13,762,324 | 11,878,076 | 25,815 | 2,500,000 | 127,491,231 |
| 2014 | 98,918,116 | 258,536 | 13,878,489 | 11,886,854 | 25,815 | 3,500,000 | 128,467,809 |
| 2015 | 99,655,599 | 258,536 | 13,994,654 | 11,895,641 | 25,815 | 6,000,000 | 131,830,244 |
| 2016 | 100,221,237 | 258,536 | 14,188,262 | 11,904,436 | 25,815 | 7,000,000 | 133,598,286 |
| 2017 | 101,030,642 | 258,536 | 14,381,870 | 11,913,241 | 25,815 | 8,000,000 | 135,610,104 |
| 2018 | 101,661,084 | 258,536 | 14,575,479 | 11,922,054 | 25,815 | 9,000,000 | 137,442,967 |
| 2019 | 102,174,975 | 258,536 | 14,769,087 | 11,930,876 | 25,815 | 9,000,000 | 138,159,288 |
| 2020 | 102,594,201 | 258,536 | 14,962,695 | 11,939,707 | 25,815 | 9,000,000 | 138,780,954 |
| 2021 | 103,708,316 | 258,536 | 15,156,304 | 11,948,546 | 25,815 | 9,000,000 | 140,097,517 |
| 2022 | 105,179,015 | 258,536 | 15,349,912 | 13,957,395 | 25,815 | 9,000,000 | 143,770,672 |
| 2023 | 105,779,490 | 258,536 | 15,543,520 | 13,966,252 | 25,815 | 9,000,000 | 144,573,613 |
| 2024 | 106,928,810 | 258,536 | 15,737,129 | 13,975,119 | 25,815 | 9,000,000 | 145,925,408 |
| 2025 | 108,100,927 | 258,536 | 15,930,737 | 13,983,994 | 25,815 | 9,000,000 | 147,300,008 |
| 2026 | 109,302,259 | 258,536 | 16,124,345 | 13,992,878 | 25,815 | 9,000,000 | 148,703,833 |
| 2027 | 110,099,530 | 258,536 | 16,317,954 | 14,001,771 | 25,815 | 9,000,000 | 149,703,605 |
| 2028 | 110,625,279 | 258,536 | 16,511,562 | 14,010,672 | 25,815 | 9,000,000 | 150,431,864 |
| 2029 | 111,151,787 | 258,536 | 16,705,170 | 14,019,583 | 25,815 | 9,000,000 | 151,160,891 |
| 2030 | 111,679,054 | 258,536 | 16,898,778 | 14,028,503 | 25,815 | 9,000,000 | 151,890,686 |
| 2031 | 112,205,784 | 258,536 | 17,092,387 | 14,037,431 | 25,815 | 9,000,000 | 152,619,953 |
| 2032 | 112,733,289 | 258,536 | 17,285,995 | 16,046,369 | 25,815 | 9,000,000 | 155,350,003 |
| 2033 | 113,261,476 | 258,536 | 17,479,603 | 16,055,315 | 25,815 | 9,000,000 | 156,080,745 |
| 2034 | 113,790,358 | 258,536 | 17,673,212 | 16,064,270 | 25,815 | 9,000,000 | 156,812,191 |
| 2035 | 114,319,853 | 258,536 | 17,866,820 | 16,073,235 | 25,815 | 9,000,000 | 157,544,258 |
| 2036 | 114,848,603 | 258,536 | 18,060,428 | 16,082,208 | 25,815 | 9,000,000 | 158,275,590 |
| 2037 | 115,375,202 | 258,536 | 18,254,037 | 16,091,190 | 25,815 | 9,000,000 | 159,004,779 |
| 2038 | 115,898,225 | 258,536 | 18,447,645 | 16,100,181 | 25,815 | 9,000,000 | 159,730,402 |
| 2039 | 116,417,558 | 258,536 | 18,641,253 | 16,109,181 | 25,815 | 9,000,000 | 160,452,343 |
| 2040 | 116,933,010 | 258,536 | 18,834,861 | 16,118,191 | 25,815 | 9,000,000 | 161,170,413 |
| 2041 | 117,444,149 | 258,536 | 19,028,470 | 16,127,209 | 25,815 | 9,000,000 | 161,884,178 |
| 2042 | 117,950,830 | 258,536 | 19,222,078 | 16,136,236 | 25,815 | 9,000,000 | 162,593,494 |
| Average Annual Growth Rates | | | | | | | |
| 1983-2012 | 0.5% | -- | 1.8% | -- | -0.1% | -- | 1.3% |
| 1997-2012 | 0.4% | -0.8% | 1.6% | -- | -0.2% | -- | 1.4% |
| 2002-2012 | -0.7% | -3.7% | 0.1% | 2.8% | -0.8% | -- | 0.4% |
| 2007-2012 | -1.9% | -9.4% | 0.4% | 1.1% | 14.0% | -- | 0.1% |
| 2012-2017 | 2.6% | 1.6% | 2.0% | 0.3% | 1.2% | -2.2% | 2.0% |
| 2012-2022 | 1.7% | 0.8% | 1.7% | 1.7% | 0.6% | 0.1% | 1.6% |
| 2012-2032 | 1.2% | 0.4% | 1.4% | 1.6% | 0.3% | 0.0% | 1.2% |
| 2012-2042 | 1.0% | 0.3% | 1.3% | 1.1% | 0.2% | 0.0% | 0.9% |

Table 3.10

Energy Requirements Forecast (kWh)
Red Lake Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|-------------|------------|------------|-------------|---|
| | Members | and Losses | and Losses | Energy | |
| | kWh | kWh /1 | % /1 | kWh | |
| 1983 | 85,027,608 | 7,216,992 | 7.8% | 92,244,600 | |
| 1984 | 87,477,688 | 5,840,312 | 6.3% | 93,318,000 | |
| 1985 | 89,779,873 | 7,271,927 | 7.5% | 97,051,800 | |
| 1986 | 90,025,925 | 4,593,129 | 4.9% | 94,619,054 | |
| 1987 | 82,104,754 | 6,176,327 | 7.0% | 88,281,081 | |
| 1988 | 87,731,344 | 6,836,149 | 7.2% | 94,567,493 | |
| 1989 | 90,980,414 | 9,464,176 | 9.4% | 100,444,590 | |
| 1990 | 89,990,533 | 4,297,619 | 4.6% | 94,288,152 | |
| 1991 | 93,231,405 | 7,691,024 | 7.6% | 100,922,429 | |
| 1992 | 92,424,245 | 6,015,608 | 6.1% | 98,439,853 | |
| 1993 | 99,185,349 | 6,976,107 | 6.6% | 106,161,456 | |
| 1994 | 98,867,117 | 7,677,111 | 7.2% | 106,544,228 | |
| 1995 | 101,359,829 | 9,333,194 | 8.4% | 110,693,023 | |
| 1996 | 109,026,453 | 7,260,880 | 6.2% | 116,287,333 | |
| 1997 | 107,744,898 | 6,586,457 | 5.8% | 114,331,355 | |
| 1998 | 97,365,507 | 7,228,719 | 6.9% | 104,594,226 | |
| 1999 | 101,014,473 | 7,959,223 | 7.3% | 108,973,696 | |
| 2000 | 103,195,452 | 9,798,013 | 8.7% | 112,993,465 | |
| 2001 | 118,386,295 | (310,705) | -0.3% | 118,075,590 | |
| 2002 | 117,404,798 | 8,007,640 | 6.4% | 125,412,438 | |
| 2003 | 114,923,899 | 8,061,633 | 6.6% | 122,985,532 | |
| 2004 | 115,003,119 | 8,195,428 | 6.7% | 123,198,547 | |
| 2005 | 116,713,026 | 7,906,005 | 6.3% | 124,619,031 | |
| 2006 | 115,595,514 | 7,183,620 | 5.9% | 122,779,134 | |
| 2007 | 122,044,715 | 7,912,425 | 6.1% | 129,957,140 | |
| 2008 | 130,832,879 | 10,874,556 | 7.7% | 141,707,435 | |
| 2009 | 134,563,362 | 8,077,338 | 5.7% | 142,640,700 | |
| 2010 | 129,688,012 | 8,238,874 | 6.0% | 137,926,886 | |
| 2011 | 133,316,555 | 6,822,438 | 4.9% | 140,138,993 | 142,901,006 |
| 2012 | 122,696,261 | 7,528,811 | 5.8% | 130,225,072 | 143,395,481 |
| 2013 | 127,491,231 | 8,126,124 | 6.0% | 135,617,354 | 144,466,207 |
| 2014 | 128,467,809 | 8,188,370 | 6.0% | 136,656,179 | 146,563,544 |
| 2015 | 131,830,244 | 8,402,687 | 6.0% | 140,232,931 | 148,433,262 |
| 2016 | 133,598,286 | 8,515,379 | 6.0% | 142,113,665 | 150,242,398 |
| 2017 | 135,610,104 | 8,643,610 | 6.0% | 144,253,714 | 152,350,530 |
| 2018 | 137,442,967 | 8,760,434 | 6.0% | 146,203,402 | 154,820,488 |
| 2019 | 138,159,288 | 8,806,092 | 6.0% | 146,965,380 | 157,473,698 |
| 2020 | 138,780,954 | 8,845,716 | 6.0% | 147,626,669 | 162,341,101 |
| 2021 | 140,097,517 | 8,929,632 | 6.0% | 149,027,149 | 165,773,439 |
| 2022 | 143,770,672 | 9,163,754 | 6.0% | 152,934,426 | 169,641,193 |
| 2023 | 144,573,613 | 9,214,932 | 6.0% | 153,788,545 | 173,697,517 |
| 2024 | 145,925,408 | 9,301,094 | 6.0% | 155,226,502 | 176,887,448 |
| 2025 | 147,300,008 | 9,388,709 | 6.0% | 156,688,717 | 179,555,723 |
| 2026 | 148,703,833 | 9,478,187 | 6.0% | 158,182,020 | 182,130,189 |
| 2027 | 149,703,605 | 9,541,911 | 6.0% | 159,245,516 | 184,658,167 |
| 2028 | 150,431,864 | 9,588,330 | 6.0% | 160,020,194 | 187,242,016 |
| 2029 | 151,160,891 | 9,634,797 | 6.0% | 160,795,688 | 189,823,948 |
| 2030 | 151,890,686 | 9,681,313 | 6.0% | 161,571,999 | 194,546,263 |
| 2031 | 152,619,953 | 9,727,795 | 6.0% | 162,347,748 | 197,118,231 |
| 2032 | 155,350,003 | 9,901,805 | 6.0% | 165,251,808 | 199,741,270 |
| 2033 | 156,080,745 | 9,948,382 | 6.0% | 166,029,126 | 202,316,824 |
| 2034 | 156,812,191 | 9,995,003 | 6.0% | 166,807,194 | 204,950,497 |
| 2035 | 157,544,258 | 10,041,664 | 6.0% | 167,585,922 | 207,561,568 |
| 2036 | 158,275,590 | 10,088,278 | 6.0% | 168,363,868 | 210,205,823 |
| 2037 | 159,004,779 | 10,134,756 | 6.0% | 169,139,535 | 212,811,493 |
| 2038 | 159,730,402 | 10,181,006 | 6.0% | 169,911,408 | 215,403,468 |
| 2039 | 160,452,343 | 10,227,022 | 6.0% | 170,679,365 | 218,008,221 |
| 2040 | 161,170,413 | 10,272,791 | 6.0% | 171,443,204 | 220,593,566 |
| 2041 | 161,884,178 | 10,318,285 | 6.0% | 172,202,463 | |
| 2042 | 162,593,494 | 10,363,496 | 6.0% | 172,956,990 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 1.3% | 0.1% | | 1.2% | -- |
| 1997-2012 | 1.4% | 1.1% | | 1.4% | -- |
| 2002-2012 | 0.4% | -0.6% | | 0.4% | -- |
| 2007-2012 | 0.1% | -1.0% | | 0.0% | -- |
| 2012-2017 | 2.0% | 2.8% | | 2.1% | 1.2% |
| 2012-2022 | 1.6% | 2.0% | | 1.6% | 1.7% |
| 2012-2032 | 1.2% | 1.4% | | 1.2% | 1.7% |
| 2012-2042 | 0.9% | 1.1% | | 1.0% | |

/1 Distribution losses

Table 3.7

Member Forecasts By Class
Red River Valley Cooperative Power Assoc.

| Year | General | | Large | Street | Resale | Total Members | |
|-----------------------------|-------------|------------|------------|------------|----------|------------------|-------|
| | Residential | Irrigation | Commercial | Commercial | Lighting | | Other |
| 1983 | 3,858 | 10 | 310 | - | 3 | - | 4,181 |
| 1984 | 3,847 | 11 | 314 | - | 3 | - | 4,176 |
| 1985 | 3,835 | 11 | 318 | - | 3 | - | 4,167 |
| 1986 | 3,844 | 11 | 326 | - | 3 | - | 4,184 |
| 1987 | 3,856 | 11 | 322 | - | 3 | - | 4,191 |
| 1988 | 3,850 | 10 | 328 | - | 3 | - | 4,190 |
| 1989 | 3,845 | 10 | 331 | - | 3 | - | 4,188 |
| 1990 | 3,841 | 12 | 332 | - | 3 | - | 4,187 |
| 1991 | 3,826 | 16 | 335 | - | 3 | - | 4,180 |
| 1992 | 3,817 | 20 | 335 | - | 3 | - | 4,175 |
| 1993 | 3,848 | 24 | 342 | - | 3 | 0 | 4,217 |
| 1994 | 3,864 | 26 | 348 | - | 3 | 0 | 4,241 |
| 1995 | 3,891 | 26 | 354 | 2 | 3 | 0 | 4,277 |
| 1996 | 3,924 | 25 | 364 | 2 | 3 | 0 | 4,318 |
| 1997 | 3,960 | 25 | 375 | 2 | 3 | 0 | 4,365 |
| 1998 | 3,972 | 24 | 402 | 3 | 3 | 0 | 4,404 |
| 1999 | 3,994 | 25 | 409 | 4 | 7 | 2 | 4,440 |
| 2000 | 3,984 | 24 | 415 | 4 | 7 | 2 | 4,436 |
| 2001 | 4,021 | 24 | 426 | 4 | 7 | 1 | 4,483 |
| 2002 | 4,079 | 23 | 437 | 4 | 7 | 0 | 4,551 |
| 2003 | 4,135 | 23 | 443 | 4 | 7 | 0 | 4,612 |
| 2004 | 4,177 | 23 | 449 | 4 | 7 | 0 | 4,660 |
| 2005 | 4,142 | 10 | 448 | 4 | 16 | 0 | 4,620 |
| 2006 | 4,172 | 10 | 446 | 5 | 15 | - | 4,648 |
| 2007 | 4,181 | 10 | 467 | 7 | 14 | - | 4,678 |
| 2008 | 4,200 | 10 | 494 | 7 | 15 | - | 4,726 |
| 2009 | 4,183 | 8 | 497 | 9 | 15 | - | 4,711 |
| 2010 | 4,132 | 7 | 503 | 9 | 16 | - | 4,667 |
| 2011 | 4,134 | 7 | 496 | 22 | 17 | - | 4,676 |
| 2012 | 4,130 | 7 | 508 | 22 | 16 | - | 4,683 |
| 2013 | 4,145 | 7 | 518 | 22 | 16 | - | 4,709 |
| 2014 | 4,170 | 7 | 525 | 22 | 16 | - | 4,740 |
| 2015 | 3,805 | 7 | 532 | 23 | 16 | - | 4,383 |
| 2016 | 3,840 | 7 | 538 | 23 | 16 | - | 4,424 |
| 2017 | 3,875 | 7 | 544 | 23 | 16 | - | 4,465 |
| 2018 | 3,900 | 7 | 549 | 24 | 16 | - | 4,496 |
| 2019 | 3,915 | 7 | 553 | 24 | 16 | - | 4,516 |
| 2020 | 3,925 | 7 | 558 | 24 | 16 | - | 4,530 |
| 2021 | 3,935 | 7 | 562 | 24 | 16 | - | 4,545 |
| 2022 | 3,945 | 7 | 566 | 25 | 16 | - | 4,560 |
| 2023 | 3,955 | 7 | 570 | 25 | 16 | - | 4,573 |
| 2024 | 3,965 | 7 | 574 | 25 | 16 | - | 4,587 |
| 2025 | 3,975 | 7 | 577 | 25 | 16 | - | 4,600 |
| 2026 | 3,985 | 7 | 580 | 26 | 16 | - | 4,615 |
| 2027 | 3,995 | 7 | 583 | 26 | 16 | - | 4,628 |
| 2028 | 4,005 | 7 | 587 | 26 | 16 | - | 4,641 |
| 2029 | 4,015 | 7 | 590 | 26 | 16 | - | 4,654 |
| 2030 | 4,025 | 7 | 593 | 27 | 16 | - | 4,668 |
| 2031 | 4,035 | 7 | 596 | 27 | 16 | - | 4,681 |
| 2032 | 4,045 | 7 | 599 | 27 | 16 | - | 4,694 |
| 2033 | 4,055 | 7 | 601 | 27 | 16 | - | 4,707 |
| 2034 | 4,065 | 7 | 605 | 28 | 16 | - | 4,721 |
| 2035 | 4,075 | 7 | 608 | 28 | 16 | - | 4,734 |
| 2036 | 4,085 | 7 | 611 | 28 | 16 | - | 4,747 |
| 2037 | 4,095 | 7 | 614 | 28 | 16 | - | 4,760 |
| 2038 | 4,105 | 7 | 617 | 28 | 16 | - | 4,774 |
| 2039 | 4,115 | 7 | 621 | 28 | 16 | - | 4,787 |
| 2040 | 4,125 | 7 | 625 | 28 | 16 | - | 4,801 |
| 2041 | 4,135 | 7 | 628 | 28 | 16 | - | 4,815 |
| 2042 | 4,145 | 7 | 632 | 28 | 16 | - | 4,828 |
| Average Annual Growth Rates | | | | | | | |
| 1983-2012 | 0.2% | -1.4% | 1.7% | -- | 6.0% | -- | 0.4% |
| 1997-2012 | 0.4% | -5.1% | 2.1% | -- | 8.9% | -- | 0.6% |
| 2002-2012 | 0.1% | -11.4% | 1.5% | 18.6% | 8.9% | -100.0% | 0.3% |
| 2007-2012 | -0.2% | -6.9% | 1.7% | 25.7% | 3.0% | -- | 0.0% |
| 2012-2017 | -1.3% | 0.0% | 1.4% | 0.9% | 0.0% | -- | -0.9% |
| 2012-2022 | -0.5% | 0.0% | 1.1% | 1.3% | 0.0% | -- | -0.3% |
| 2012-2032 | -0.1% | 0.0% | 0.8% | 1.0% | 0.0% | -- | 0.0% |
| 2012-2042 | 0.0% | 0.0% | 0.7% | 0.8% | 0.0% | -- | 0.1% |

Table 3.8

Energy Forecasts By Class (kWh)
Red River Valley Cooperative Power Assoc.

| <u>Year</u> | <u>Residential</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Resale Other</u> | <u>Total kWh Sales</u> |
|------------------------------------|--------------------|-------------------|---------------------------|-------------------------|------------------------|---------------------|------------------------|
| 1983 | 80,764,570 | 109,320 | 16,803,050 | - | 122,840 | - | 97,799,780 |
| 1984 | 83,313,740 | 226,940 | 16,968,910 | - | 118,020 | - | 100,627,610 |
| 1985 | 86,444,540 | 98,980 | 18,032,050 | - | 115,700 | - | 104,691,270 |
| 1986 | 83,775,910 | 175,620 | 17,379,570 | - | 114,650 | - | 101,445,750 |
| 1987 | 77,513,830 | 119,930 | 15,967,730 | - | 112,140 | - | 93,713,630 |
| 1988 | 84,503,370 | 373,380 | 16,310,340 | - | 121,900 | - | 101,308,990 |
| 1989 | 86,824,350 | 299,980 | 15,678,170 | - | 118,440 | - | 102,920,940 |
| 1990 | 83,527,730 | 396,400 | 16,822,550 | - | 127,020 | - | 100,873,700 |
| 1991 | 86,679,430 | 253,390 | 17,349,720 | - | 123,050 | - | 104,405,590 |
| 1992 | 84,774,700 | 334,750 | 17,171,620 | - | 123,210 | - | 102,404,280 |
| 1993 | 88,951,540 | 261,950 | 19,125,540 | - | 122,820 | 1,112,730 | 109,574,580 |
| 1994 | 89,366,400 | 376,100 | 19,464,960 | - | 122,780 | 1,298,470 | 110,628,710 |
| 1995 | 90,571,990 | 464,300 | 19,427,790 | 277,600 | 121,510 | 1,902,470 | 112,765,660 |
| 1996 | 98,354,020 | 530,410 | 19,836,030 | 1,236,400 | 120,820 | 1,937,110 | 122,014,790 |
| 1997 | 95,151,658 | 518,580 | 19,410,381 | 1,894,000 | 113,960 | 1,577,630 | 118,666,209 |
| 1998 | 87,276,657 | 361,340 | 18,157,590 | 2,274,400 | 111,750 | 1,611,050 | 109,792,787 |
| 1999 | 83,770,873 | 328,915 | 18,944,890 | 3,758,000 | 145,670 | 2,123,225 | 109,071,573 |
| 2000 | 84,149,714 | 258,475 | 16,782,604 | 4,909,900 | 149,190 | 2,533,305 | 108,783,188 |
| 2001 | 89,425,151 | 414,443 | 16,917,809 | 5,042,100 | 150,290 | 2,557,320 | 114,507,113 |
| 2002 | 92,243,657 | 202,473 | 17,852,158 | 5,051,800 | 162,155 | 2,946,160 | 118,458,403 |
| 2003 | 90,930,186 | 460,845 | 16,279,689 | 6,405,464 | 170,380 | 3,103,970 | 117,350,534 |
| 2004 | 92,422,067 | 45,513 | 16,906,879 | 6,484,783 | 174,470 | 2,130,490 | 118,164,202 |
| 2005 | 93,733,242 | 66,620 | 17,647,600 | 6,727,969 | 53,622 | 2,818,770 | 121,047,823 |
| 2006 | 94,373,392 | 185,600 | 16,550,579 | 6,142,766 | 88,355 | - | 117,340,692 |
| 2007 | 94,684,581 | 142,780 | 19,552,233 | 8,838,896 | 182,705 | - | 123,401,195 |
| 2008 | 100,443,722 | 97,220 | 20,564,007 | 9,070,281 | 197,655 | - | 130,372,885 |
| 2009 | 107,772,413 | 121,260 | 24,367,966 | 10,011,000 | 203,247 | - | 142,475,886 |
| 2010 | 105,971,658 | 110,680 | 25,934,534 | 9,467,220 | 220,760 | - | 141,704,852 |
| 2011 | 94,939,566 | 30,300 | 18,835,172 | 10,877,984 | 197,582 | - | 124,880,604 |
| 2012 | 86,560,655 | 264,800 | 20,415,362 | 9,796,320 | 199,080 | - | 117,236,217 |
| 2013 | 87,753,119 | 116,672 | 20,849,670 | 9,828,108 | 209,829 | - | 118,757,399 |
| 2014 | 85,842,779 | 116,672 | 21,120,584 | 9,860,095 | 209,829 | - | 117,149,958 |
| 2015 | 78,298,663 | 116,672 | 21,386,146 | 10,892,281 | 209,829 | - | 110,903,591 |
| 2016 | 78,841,314 | 116,672 | 21,634,619 | 10,924,667 | 209,829 | - | 111,727,101 |
| 2017 | 79,759,759 | 116,672 | 21,863,228 | 10,957,256 | 209,829 | - | 112,906,744 |
| 2018 | 80,924,506 | 116,672 | 22,070,547 | 11,990,049 | 209,829 | - | 115,311,602 |
| 2019 | 81,757,537 | 116,672 | 22,261,921 | 12,023,046 | 209,829 | - | 116,369,006 |
| 2020 | 82,345,992 | 116,672 | 22,442,701 | 12,056,251 | 209,829 | - | 117,171,445 |
| 2021 | 83,774,524 | 116,672 | 22,619,922 | 12,089,663 | 209,829 | - | 118,810,610 |
| 2022 | 85,630,342 | 116,672 | 22,780,048 | 13,123,284 | 209,829 | - | 121,860,175 |
| 2023 | 87,629,161 | 116,672 | 22,927,662 | 13,157,117 | 209,829 | - | 124,040,441 |
| 2024 | 89,074,282 | 116,672 | 23,068,985 | 13,191,162 | 209,829 | - | 125,660,931 |
| 2025 | 90,537,314 | 116,672 | 23,204,423 | 13,225,420 | 209,829 | - | 127,293,659 |
| 2026 | 91,389,302 | 116,672 | 23,337,060 | 14,259,895 | 209,829 | - | 129,312,758 |
| 2027 | 91,736,029 | 116,672 | 23,464,245 | 14,294,586 | 209,829 | - | 129,821,361 |
| 2028 | 91,744,544 | 116,672 | 23,592,090 | 14,329,495 | 209,829 | - | 129,992,630 |
| 2029 | 91,747,482 | 116,672 | 23,715,189 | 14,364,624 | 209,829 | - | 130,153,796 |
| 2030 | 91,747,795 | 116,672 | 23,836,047 | 15,399,975 | 209,829 | - | 131,310,318 |
| 2031 | 91,743,581 | 116,672 | 23,956,120 | 15,435,549 | 209,829 | - | 131,461,751 |
| 2032 | 91,737,801 | 116,672 | 24,073,424 | 15,471,347 | 209,829 | - | 131,609,074 |
| 2033 | 91,731,379 | 116,672 | 24,191,859 | 15,507,372 | 209,829 | - | 131,757,111 |
| 2034 | 91,725,226 | 116,672 | 24,314,648 | 16,543,624 | 209,829 | - | 132,909,999 |
| 2035 | 91,719,276 | 116,672 | 24,434,505 | 16,580,106 | 209,829 | - | 133,060,388 |
| 2036 | 91,710,727 | 116,672 | 24,560,218 | 16,616,819 | 209,829 | - | 133,214,265 |
| 2037 | 91,697,961 | 116,672 | 24,689,284 | 16,653,764 | 209,829 | - | 133,367,511 |
| 2038 | 91,679,387 | 116,672 | 24,825,718 | 16,690,944 | 209,829 | - | 133,522,550 |
| 2039 | 91,655,004 | 116,672 | 24,967,610 | 16,728,359 | 209,829 | - | 133,677,474 |
| 2040 | 91,624,739 | 116,672 | 25,119,280 | 16,766,012 | 209,829 | - | 133,836,532 |
| 2041 | 91,588,640 | 116,672 | 25,271,489 | 16,803,904 | 209,829 | - | 133,990,535 |
| 2042 | 91,546,674 | 116,672 | 25,424,655 | 16,842,038 | 209,829 | - | 134,139,869 |
| Average Annual Growth Rates | | | | | | | |
| 1983-2012 | 0.2% | 3.1% | 0.7% | -- | 1.7% | -- | 0.6% |
| 1997-2012 | 0.1% | -1.2% | 0.9% | -- | 2.4% | -- | 0.7% |
| 2002-2012 | -0.6% | 2.7% | 1.4% | 6.8% | 2.1% | -100.0% | -0.1% |
| 2007-2012 | -1.8% | 13.1% | 0.9% | 2.1% | 1.7% | -- | -1.0% |
| 2012-2017 | -1.6% | -15.1% | 1.4% | 2.3% | 1.1% | -- | -0.7% |
| 2012-2022 | -0.1% | -7.9% | 1.1% | 3.0% | 0.5% | -- | 0.4% |
| 2012-2032 | 0.3% | -4.0% | 0.8% | 2.3% | 0.3% | -- | 0.6% |
| 2012-2042 | 0.2% | -2.7% | 0.7% | 1.8% | 0.2% | -- | 0.4% |

Table 3.9

Energy Requirements Forecast (kWh)
Red River Valley Cooperative Power Assoc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|-------------|------------|------------|-------------|---|
| | Members | and Losses | and Losses | Energy | |
| | kWh | kWh /1 | % /1 | kWh | |
| 1983 | 97,799,780 | 8,510,620 | 8.0% | 106,310,400 | |
| 1984 | 100,627,610 | 7,371,790 | 6.8% | 107,999,400 | |
| 1985 | 104,691,270 | 7,412,530 | 6.6% | 112,103,800 | |
| 1986 | 101,445,750 | 7,910,850 | 7.2% | 109,356,600 | |
| 1987 | 93,713,630 | 8,366,770 | 8.2% | 102,080,400 | |
| 1988 | 101,308,990 | 7,944,410 | 7.3% | 109,253,400 | |
| 1989 | 102,920,940 | 8,283,460 | 7.4% | 111,204,400 | |
| 1990 | 100,873,700 | 5,019,700 | 4.7% | 105,893,400 | |
| 1991 | 104,405,590 | 7,992,410 | 7.1% | 112,398,000 | |
| 1992 | 102,404,280 | 6,765,367 | 6.2% | 109,169,647 | |
| 1993 | 109,574,580 | 9,118,546 | 7.7% | 118,693,126 | |
| 1994 | 110,628,710 | 8,512,756 | 7.1% | 119,141,466 | |
| 1995 | 112,765,660 | 9,565,354 | 7.8% | 122,331,014 | |
| 1996 | 122,014,790 | 4,935,655 | 3.9% | 126,950,445 | |
| 1997 | 118,666,209 | 3,041,687 | 2.5% | 121,707,896 | |
| 1998 | 109,792,787 | 2,504,977 | 2.2% | 112,297,764 | |
| 1999 | 109,071,573 | 5,950,621 | 5.2% | 115,022,194 | |
| 2000 | 108,783,188 | 8,232,924 | 7.0% | 117,016,112 | |
| 2001 | 114,507,113 | 6,721,257 | 5.5% | 121,228,370 | |
| 2002 | 118,458,403 | 8,354,029 | 6.6% | 126,812,432 | |
| 2003 | 117,350,534 | 7,664,393 | 6.1% | 125,014,927 | |
| 2004 | 118,164,202 | 7,482,494 | 6.0% | 125,646,696 | |
| 2005 | 121,047,823 | 7,730,024 | 6.0% | 128,777,847 | |
| 2006 | 117,340,692 | 7,234,214 | 5.8% | 124,574,906 | |
| 2007 | 123,401,195 | 9,156,584 | 6.9% | 132,557,779 | |
| 2008 | 130,372,885 | 10,634,781 | 7.5% | 141,007,666 | |
| 2009 | 142,475,886 | 8,182,587 | 5.4% | 150,658,473 | |
| 2010 | 141,704,852 | 3,769,932 | 2.6% | 145,474,784 | |
| 2011 | 124,880,604 | 9,377,762 | 7.0% | 134,258,366 | 150,173,929 |
| 2012 | 117,236,217 | 8,735,949 | 6.9% | 125,972,166 | 153,810,522 |
| 2013 | 118,757,399 | 7,441,805 | 5.9% | 126,199,204 | 156,082,463 |
| 2014 | 117,149,958 | 7,341,077 | 5.9% | 124,491,035 | 158,168,267 |
| 2015 | 110,903,591 | 6,949,655 | 5.9% | 117,853,245 | 159,972,572 |
| 2016 | 111,727,101 | 7,001,259 | 5.9% | 118,728,360 | 153,480,985 |
| 2017 | 112,906,744 | 7,075,180 | 5.9% | 119,981,925 | 155,416,754 |
| 2018 | 115,311,602 | 7,225,878 | 5.9% | 122,537,480 | 157,645,070 |
| 2019 | 116,369,006 | 7,292,139 | 5.9% | 123,661,145 | 159,892,885 |
| 2020 | 117,171,445 | 7,342,423 | 5.9% | 124,513,868 | 163,267,594 |
| 2021 | 118,810,610 | 7,445,140 | 5.9% | 126,255,749 | 166,107,893 |
| 2022 | 121,860,175 | 7,636,237 | 5.9% | 129,496,412 | 169,110,236 |
| 2023 | 124,040,441 | 7,772,861 | 5.9% | 131,813,302 | 172,161,655 |
| 2024 | 125,660,931 | 7,874,408 | 5.9% | 133,535,338 | 175,860,827 |
| 2025 | 127,293,659 | 7,976,721 | 5.9% | 135,270,380 | 178,041,522 |
| 2026 | 129,312,758 | 8,103,245 | 5.9% | 137,416,003 | 180,088,127 |
| 2027 | 129,821,361 | 8,135,116 | 5.9% | 137,956,478 | 182,089,580 |
| 2028 | 129,992,630 | 8,145,849 | 5.9% | 138,138,479 | 185,276,273 |
| 2029 | 130,153,796 | 8,155,948 | 5.9% | 138,309,744 | 187,298,768 |
| 2030 | 131,310,318 | 8,228,420 | 5.9% | 139,538,738 | 189,273,048 |
| 2031 | 131,461,751 | 8,237,910 | 5.9% | 139,699,660 | 191,391,098 |
| 2032 | 131,609,074 | 8,247,142 | 5.9% | 139,856,215 | 194,456,424 |
| 2033 | 131,757,111 | 8,256,418 | 5.9% | 140,013,529 | 196,453,916 |
| 2034 | 132,909,999 | 8,328,663 | 5.9% | 141,238,662 | 198,399,118 |
| 2035 | 133,060,388 | 8,338,087 | 5.9% | 141,398,475 | 200,490,439 |
| 2036 | 133,214,265 | 8,347,729 | 5.9% | 141,561,994 | 202,460,274 |
| 2037 | 133,367,511 | 8,357,332 | 5.9% | 141,724,843 | 204,379,228 |
| 2038 | 133,522,550 | 8,367,048 | 5.9% | 141,889,598 | 206,432,116 |
| 2039 | 133,677,474 | 8,376,756 | 5.9% | 142,054,229 | 208,367,044 |
| 2040 | 133,836,532 | 8,386,723 | 5.9% | 142,223,255 | 210,253,348 |
| 2041 | 133,990,535 | 8,396,373 | 5.9% | 142,386,908 | |
| 2042 | 134,139,869 | 8,405,731 | 5.9% | 142,545,600 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 0.6% | 0.1% | | 0.6% | -- |
| 1997-2012 | 0.7% | 1.3% | | 0.7% | -- |
| 2002-2012 | -0.1% | 0.4% | | -0.1% | -- |
| 2007-2012 | -1.0% | -0.9% | | -1.0% | -- |
| 2012-2017 | -0.7% | -4.1% | | -1.0% | 0.2% |
| 2012-2022 | 0.4% | -1.3% | | 0.3% | 1.0% |
| 2012-2032 | 0.6% | -0.3% | | 0.5% | 1.2% |
| 2012-2042 | 0.4% | -0.1% | | 0.4% | |

/1 Distribution losses

Table 3.7

Member Forecasts By Class
Roseau Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Total Members</u> |
|------------------------------------|--------------------|-----------------|---------------------------|-------------------------|------------------------|----------------------|
| 1983 | 3,709 | 157 | 163 | | 1 2 | 4,031 |
| 1984 | 3,752 | 161 | 156 | | 1 2 | 4,072 |
| 1985 | 3,840 | 165 | 153 | | 1 2 | 4,161 |
| 1986 | 3,945 | 166 | 150 | | 1 2 | 4,264 |
| 1987 | 4,082 | 171 | 160 | | 1 2 | 4,416 |
| 1988 | 4,257 | 179 | 170 | | 1 2 | 4,609 |
| 1989 | 4,388 | 183 | 174 | | 1 2 | 4,748 |
| 1990 | 4,504 | 189 | 177 | | 1 2 | 4,872 |
| 1991 | 4,600 | 196 | 184 | | 1 2 | 4,983 |
| 1992 | 4,694 | 204 | 188 | | 1 2 | 5,089 |
| 1993 | 4,734 | 218 | 195 | | 1 2 | 5,149 |
| 1994 | 4,801 | 229 | 209 | | 1 2 | 5,242 |
| 1995 | 4,932 | 244 | 224 | | 1 2 | 5,403 |
| 1996 | 5,053 | 257 | 227 | | 1 2 | 5,540 |
| 1997 | 5,131 | 260 | 231 | | 1 2 | 5,624 |
| 1998 | 5,204 | 270 | 245 | | 2 2 | 5,723 |
| 1999 | 5,250 | 278 | 253 | | 2 2 | 5,786 |
| 2000 | 5,376 | 308 | 253 | | 4 2 | 5,943 |
| 2001 | 5,343 | 305 | 254 | | 4 3 | 5,910 |
| 2002 | 5,406 | 314 | 262 | | 4 3 | 5,988 |
| 2003 | 5,475 | 323 | 266 | | 4 2 | 6,069 |
| 2004 | 5,526 | 337 | 281 | | 4 2 | 6,150 |
| 2005 | 5,570 | 344 | 285 | | 4 2 | 6,205 |
| 2006 | 5,625 | 361 | 290 | | 4 2 | 6,281 |
| 2007 | 5,662 | 363 | 292 | | 4 2 | 6,323 |
| 2008 | 5,679 | 367 | 291 | | 4 4 | 6,346 |
| 2009 | 5,664 | 374 | 302 | | 4 4 | 6,348 |
| 2010 | 5,630 | 377 | 303 | | 5 4 | 6,318 |
| 2011 | 5,636 | 382 | 299 | | 6 4 | 6,327 |
| 2012 | 5,634 | 386 | 301 | | 6 5 | 6,332 |
| 2013 | 5,639 | 389 | 301 | | 6 5 | 6,340 |
| 2014 | 5,649 | 392 | 302 | | 6 5 | 6,353 |
| 2015 | 5,664 | 395 | 302 | | 6 5 | 6,372 |
| 2016 | 5,684 | 398 | 303 | | 6 5 | 6,396 |
| 2017 | 5,714 | 401 | 305 | | 6 5 | 6,430 |
| 2018 | 5,749 | 404 | 306 | | 6 5 | 6,470 |
| 2019 | 5,789 | 407 | 309 | | 6 5 | 6,515 |
| 2020 | 5,820 | 410 | 311 | | 6 5 | 6,551 |
| 2021 | 5,849 | 413 | 313 | | 6 5 | 6,586 |
| 2022 | 5,873 | 416 | 316 | | 6 5 | 6,615 |
| 2023 | 5,895 | 419 | 318 | | 6 5 | 6,642 |
| 2024 | 5,914 | 422 | 320 | | 6 5 | 6,667 |
| 2025 | 5,932 | 425 | 322 | | 6 5 | 6,689 |
| 2026 | 5,948 | 428 | 324 | | 6 5 | 6,711 |
| 2027 | 5,964 | 431 | 325 | | 6 5 | 6,731 |
| 2028 | 5,978 | 434 | 327 | | 6 5 | 6,750 |
| 2029 | 5,991 | 437 | 328 | | 6 5 | 6,767 |
| 2030 | 6,003 | 440 | 330 | | 6 5 | 6,784 |
| 2031 | 6,015 | 443 | 331 | | 6 5 | 6,800 |
| 2032 | 6,025 | 446 | 332 | | 6 5 | 6,814 |
| 2033 | 6,036 | 449 | 333 | | 6 5 | 6,829 |
| 2034 | 6,046 | 452 | 334 | | 6 5 | 6,843 |
| 2035 | 6,055 | 455 | 335 | | 6 5 | 6,856 |
| 2036 | 6,065 | 458 | 336 | | 6 5 | 6,870 |
| 2037 | 6,076 | 461 | 337 | | 6 5 | 6,885 |
| 2038 | 6,087 | 464 | 338 | | 6 5 | 6,900 |
| 2039 | 6,100 | 467 | 339 | | 6 5 | 6,916 |
| 2040 | 6,113 | 470 | 340 | | 6 5 | 6,934 |
| 2041 | 6,127 | 473 | 341 | | 6 5 | 6,952 |
| 2042 | 6,140 | 476 | 343 | | 6 5 | 6,969 |
| Average Annual Growth Rates | | | | | | |
| 1983-2012 | 1.5% | 3.2% | 2.1% | 6.4% | 3.1% | 1.6% |
| 1997-2012 | 0.9% | 3.2% | 2.4% | 9.4% | 4.5% | 1.1% |
| 2002-2012 | 0.4% | 2.1% | 1.4% | 4.1% | 6.1% | 0.6% |
| 2007-2012 | -0.1% | 1.2% | 0.6% | 8.4% | 19.3% | 0.0% |
| 2012-2017 | 0.3% | 0.8% | 0.2% | 0.0% | 0.0% | 0.3% |
| 2012-2022 | 0.4% | 0.8% | 0.5% | 0.0% | 0.0% | 0.4% |
| 2012-2032 | 0.3% | 0.7% | 0.5% | 0.0% | 0.0% | 0.4% |
| 2012-2042 | 0.3% | 0.7% | 0.4% | 0.0% | 0.0% | 0.3% |

Table 3.8

Energy Forecasts By Class (kWh)
Roseau Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Total kWh Sales</u> |
|-------------|--------------------|-----------------|---------------------------|-------------------------|------------------------|------------------------|
| 1983 | 63,252,949 | 1,409,476 | 5,335,994 | 3,112,200 | 33,040 | 73,143,659 |
| 1984 | 67,237,935 | 1,663,306 | 5,424,166 | 3,553,200 | 34,440 | 77,913,047 |
| 1985 | 70,685,624 | 1,482,095 | 5,629,237 | 4,208,400 | 34,440 | 82,039,796 |
| 1986 | 74,818,907 | 1,462,910 | 5,160,041 | 4,775,400 | 33,600 | 86,250,858 |
| 1987 | 70,796,513 | 1,459,247 | 5,905,075 | 6,307,200 | 33,600 | 84,501,635 |
| 1988 | 77,654,951 | 1,725,326 | 8,004,824 | 6,978,600 | 34,510 | 94,398,211 |
| 1989 | 83,356,236 | 2,125,981 | 8,665,042 | 8,017,200 | 36,400 | 102,200,859 |
| 1990 | 85,426,346 | 2,358,058 | 8,717,885 | 10,162,800 | 37,170 | 106,702,259 |
| 1991 | 89,110,651 | 2,644,348 | 8,728,393 | 10,386,000 | 40,390 | 110,909,782 |
| 1992 | 92,129,088 | 2,729,019 | 9,327,866 | 10,818,000 | 43,260 | 115,047,233 |
| 1993 | 96,368,818 | 3,264,297 | 10,192,450 | 12,340,800 | 47,040 | 122,213,405 |
| 1994 | 95,995,156 | 2,920,091 | 10,337,724 | 16,888,800 | 47,950 | 126,189,721 |
| 1995 | 100,235,512 | 3,216,646 | 13,114,523 | 18,684,000 | 49,420 | 135,300,101 |
| 1996 | 110,375,803 | 4,460,349 | 11,993,595 | 20,271,600 | 52,990 | 147,154,337 |
| 1997 | 110,932,749 | 4,063,763 | 12,079,572 | 21,146,400 | 64,800 | 148,287,284 |
| 1998 | 99,008,087 | 3,754,229 | 11,331,043 | 22,177,200 | 97,920 | 136,368,479 |
| 1999 | 110,100,659 | 4,148,234 | 12,741,382 | 28,015,200 | 97,850 | 155,103,325 |
| 2000 | 105,114,690 | 4,591,601 | 12,439,319 | 31,997,421 | - | 154,143,031 |
| 2001 | 107,100,314 | 5,028,367 | 12,634,647 | 30,522,239 | 92,620 | 155,378,187 |
| 2002 | 113,892,422 | 5,390,431 | 13,359,875 | 30,288,041 | 101,880 | 163,032,649 |
| 2003 | 111,793,662 | 5,541,620 | 13,127,777 | 30,871,968 | 102,720 | 161,437,747 |
| 2004 | 111,847,060 | 5,583,980 | 13,260,995 | 32,343,429 | 104,400 | 163,139,864 |
| 2005 | 110,658,984 | 5,508,929 | 13,286,851 | 32,829,506 | 104,400 | 162,388,670 |
| 2006 | 107,701,848 | 5,576,836 | 13,077,634 | 30,707,247 | 104,960 | 157,168,525 |
| 2007 | 110,749,267 | 5,881,734 | 12,875,946 | 31,238,977 | 88,470 | 160,834,394 |
| 2008 | 115,542,207 | 6,179,541 | 13,504,848 | 34,732,243 | 110,910 | 170,069,749 |
| 2009 | 114,251,798 | 6,739,214 | 14,166,576 | 30,521,213 | 112,800 | 165,791,601 |
| 2010 | 103,613,062 | 6,110,284 | 13,574,281 | 35,037,360 | 112,800 | 158,447,787 |
| 2011 | 104,227,704 | 6,414,528 | 13,161,179 | 39,692,628 | 113,520 | 163,609,559 |
| 2012 | 102,644,064 | 6,469,494 | 15,769,744 | 41,430,196 | 82,689 | 166,396,187 |
| 2013 | 102,238,527 | 6,581,247 | 15,996,115 | 41,795,128 | 82,276 | 166,693,292 |
| 2014 | 101,518,263 | 6,632,035 | 15,761,060 | 42,163,647 | 81,864 | 166,156,868 |
| 2015 | 101,587,198 | 6,682,822 | 15,588,089 | 42,535,788 | 81,455 | 166,475,352 |
| 2016 | 101,637,249 | 6,733,610 | 15,578,904 | 42,911,588 | 81,048 | 166,942,398 |
| 2017 | 102,374,735 | 6,784,398 | 15,622,247 | 43,291,082 | 80,642 | 168,153,104 |
| 2018 | 103,068,761 | 6,835,186 | 15,724,949 | 43,674,308 | 80,239 | 169,383,443 |
| 2019 | 103,739,942 | 6,885,973 | 15,838,699 | 44,061,302 | 79,838 | 170,605,754 |
| 2020 | 104,377,378 | 6,936,761 | 15,946,704 | 44,452,102 | 79,439 | 171,792,385 |
| 2021 | 105,399,693 | 6,987,549 | 16,133,577 | 44,846,746 | 79,042 | 173,446,606 |
| 2022 | 106,281,695 | 7,038,337 | 16,353,925 | 45,245,271 | 78,646 | 174,997,873 |
| 2023 | 106,954,609 | 7,089,124 | 16,578,409 | 45,647,716 | 78,253 | 176,348,111 |
| 2024 | 107,652,471 | 7,139,912 | 16,743,855 | 46,054,120 | 77,862 | 177,668,219 |
| 2025 | 108,360,808 | 7,190,700 | 16,901,249 | 46,464,522 | 77,473 | 178,994,751 |
| 2026 | 108,679,609 | 7,241,488 | 16,995,659 | 46,878,962 | 77,085 | 179,872,802 |
| 2027 | 108,882,379 | 7,292,275 | 17,036,942 | 47,297,480 | 76,700 | 180,585,775 |
| 2028 | 109,202,379 | 7,343,063 | 17,039,705 | 47,720,116 | 76,316 | 181,381,579 |
| 2029 | 109,334,385 | 7,393,851 | 17,033,843 | 48,146,911 | 75,935 | 181,984,925 |
| 2030 | 109,613,073 | 7,444,639 | 17,019,122 | 48,577,907 | 75,555 | 182,730,296 |
| 2031 | 109,712,791 | 7,495,426 | 16,996,182 | 49,013,145 | 75,177 | 183,292,722 |
| 2032 | 109,928,601 | 7,546,214 | 16,965,519 | 49,452,668 | 74,801 | 183,967,803 |
| 2033 | 110,001,236 | 7,597,002 | 16,928,079 | 49,896,517 | 74,427 | 184,497,261 |
| 2034 | 110,209,146 | 7,647,790 | 16,884,315 | 50,344,735 | 74,055 | 185,160,041 |
| 2035 | 110,229,473 | 7,698,577 | 16,834,773 | 50,797,367 | 73,685 | 185,633,875 |
| 2036 | 110,431,392 | 7,749,365 | 16,780,391 | 51,254,455 | 73,316 | 186,288,919 |
| 2037 | 110,466,921 | 7,800,153 | 16,722,028 | 51,716,044 | 72,950 | 186,778,096 |
| 2038 | 110,660,541 | 7,850,941 | 16,661,186 | 52,182,179 | 72,585 | 187,427,432 |
| 2039 | 110,725,537 | 7,901,728 | 16,598,813 | 52,652,905 | 72,222 | 187,951,205 |
| 2040 | 110,775,628 | 7,952,516 | 16,535,794 | 53,128,267 | 71,861 | 188,464,066 |
| 2041 | 110,821,405 | 8,003,304 | 16,471,298 | 53,608,311 | 71,502 | 188,975,820 |
| 2042 | 110,862,781 | 8,054,092 | 16,404,680 | 54,093,084 | 71,144 | 189,485,782 |

Average Annual Growth Rates

| | | | | | | |
|-----------|-------|------|-------|------|-------|------|
| 1983-2012 | 1.7% | 5.4% | 3.8% | 9.3% | 3.2% | 2.9% |
| 1997-2012 | 0.5% | 4.4% | 2.7% | 6.9% | 3.3% | 1.9% |
| 2002-2012 | -1.0% | 1.8% | 1.7% | 3.2% | -2.1% | 0.2% |
| 2007-2012 | -1.5% | 1.9% | 4.1% | 5.8% | -1.3% | 0.7% |
| 2012-2017 | -0.1% | 1.0% | -0.2% | 0.9% | -0.5% | 0.2% |
| 2012-2022 | 0.3% | 0.8% | 0.4% | 0.9% | -0.5% | 0.5% |
| 2012-2032 | 0.3% | 0.8% | 0.4% | 0.9% | -0.5% | 0.5% |
| 2012-2042 | 0.3% | 0.7% | 0.1% | 0.9% | -0.5% | 0.4% |

Table 3.9

Energy Requirements Forecast (kWh)
Roseau Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|-------------|------------|------------|-------------|---|
| | Members | and Losses | and Losses | Energy | |
| | kWh | kWh /1 | % /1 | kWh | |
| 1983 | 73,143,659 | 5,771,281 | 7.3% | 78,914,940 | |
| 1984 | 77,913,047 | 4,843,573 | 5.9% | 82,756,620 | |
| 1985 | 82,039,796 | 7,740,004 | 8.6% | 89,779,800 | |
| 1986 | 86,250,858 | 4,076,382 | 4.5% | 90,327,240 | |
| 1987 | 84,501,635 | 5,884,105 | 6.5% | 90,385,740 | |
| 1988 | 94,398,211 | 7,322,969 | 7.2% | 101,721,180 | |
| 1989 | 102,200,859 | 10,149,021 | 9.0% | 112,349,880 | |
| 1990 | 106,702,259 | 4,060,221 | 3.7% | 110,762,480 | |
| 1991 | 110,909,782 | 9,223,627 | 7.7% | 120,133,409 | |
| 1992 | 115,047,233 | 6,675,273 | 5.5% | 121,722,506 | |
| 1993 | 122,213,405 | 6,691,158 | 5.2% | 128,904,563 | |
| 1994 | 126,189,721 | 8,283,601 | 6.2% | 134,473,322 | |
| 1995 | 135,300,101 | 9,804,138 | 6.8% | 145,104,239 | |
| 1996 | 147,154,337 | 7,261,404 | 4.7% | 154,415,741 | |
| 1997 | 148,287,284 | 3,885,810 | 2.6% | 152,173,094 | |
| 1998 | 136,368,479 | 7,666,839 | 5.3% | 144,035,318 | |
| 1999 | 155,103,325 | (949,625) | -0.6% | 154,153,700 | |
| 2000 | 154,143,031 | 6,802,339 | 4.2% | 160,945,370 | |
| 2001 | 155,378,187 | 8,857,098 | 5.4% | 164,235,285 | |
| 2002 | 163,032,649 | 7,826,984 | 4.6% | 170,859,633 | |
| 2003 | 161,437,747 | 7,784,747 | 4.6% | 169,222,494 | |
| 2004 | 163,139,864 | 8,417,893 | 4.9% | 171,557,757 | |
| 2005 | 162,388,670 | 7,837,346 | 4.6% | 170,226,016 | |
| 2006 | 157,168,525 | 7,613,766 | 4.6% | 164,782,291 | |
| 2007 | 160,834,394 | 9,214,244 | 5.4% | 170,048,638 | |
| 2008 | 170,069,749 | 8,962,988 | 5.0% | 179,032,737 | |
| 2009 | 165,791,601 | 7,061,426 | 4.1% | 172,853,027 | |
| 2010 | 158,447,787 | 7,482,317 | 4.5% | 165,930,104 | |
| 2011 | 163,609,559 | 8,590,484 | 5.0% | 172,200,043 | 169,950,150 |
| 2012 | 166,396,187 | 4,913,938 | 2.9% | 171,310,125 | 170,188,807 |
| 2013 | 166,693,292 | 7,474,585 | 4.3% | 174,167,877 | 171,656,730 |
| 2014 | 166,156,868 | 7,450,532 | 4.3% | 173,607,400 | 173,039,300 |
| 2015 | 166,475,352 | 7,464,813 | 4.3% | 173,940,165 | 174,266,963 |
| 2016 | 166,942,398 | 7,485,755 | 4.3% | 174,428,153 | 175,804,461 |
| 2017 | 168,153,104 | 7,540,044 | 4.3% | 175,693,148 | 177,391,148 |
| 2018 | 169,383,443 | 7,595,212 | 4.3% | 176,978,655 | 179,535,384 |
| 2019 | 170,605,754 | 7,650,021 | 4.3% | 178,255,776 | 181,385,321 |
| 2020 | 171,792,385 | 7,703,230 | 4.3% | 179,495,615 | 183,524,763 |
| 2021 | 173,446,606 | 7,777,406 | 4.3% | 181,224,012 | 186,434,486 |
| 2022 | 174,997,873 | 7,846,965 | 4.3% | 182,844,839 | 189,383,923 |
| 2023 | 176,348,111 | 7,907,510 | 4.3% | 184,255,621 | 192,106,402 |
| 2024 | 177,668,219 | 7,966,705 | 4.3% | 185,634,923 | 194,223,066 |
| 2025 | 178,994,751 | 8,026,187 | 4.3% | 187,020,938 | 196,132,158 |
| 2026 | 179,872,802 | 8,065,559 | 4.3% | 187,938,361 | 197,680,398 |
| 2027 | 180,585,775 | 8,097,529 | 4.3% | 188,683,304 | 199,524,628 |
| 2028 | 181,381,579 | 8,133,213 | 4.3% | 189,514,792 | 201,312,448 |
| 2029 | 181,984,925 | 8,160,267 | 4.3% | 190,145,192 | 203,141,225 |
| 2030 | 182,730,296 | 8,193,690 | 4.3% | 190,923,986 | 204,939,298 |
| 2031 | 183,292,722 | 8,218,909 | 4.3% | 191,511,632 | 206,701,254 |
| 2032 | 183,967,803 | 8,249,180 | 4.3% | 192,216,983 | 208,480,548 |
| 2033 | 184,497,261 | 8,272,921 | 4.3% | 192,770,182 | 210,249,058 |
| 2034 | 185,160,041 | 8,302,640 | 4.3% | 193,462,681 | 211,990,656 |
| 2035 | 185,633,875 | 8,323,887 | 4.3% | 193,957,762 | 214,032,961 |
| 2036 | 186,288,919 | 8,353,260 | 4.3% | 194,642,179 | 215,752,058 |
| 2037 | 186,778,096 | 8,375,195 | 4.3% | 195,153,291 | 217,500,100 |
| 2038 | 187,427,432 | 8,404,311 | 4.3% | 195,831,744 | 219,173,324 |
| 2039 | 187,951,205 | 8,427,797 | 4.3% | 196,379,003 | 221,128,175 |
| 2040 | 188,464,066 | 8,450,794 | 4.3% | 196,914,860 | 222,814,538 |
| 2041 | 188,975,820 | 8,473,741 | 4.3% | 197,449,562 | |
| 2042 | 189,485,782 | 8,496,608 | 4.3% | 197,982,390 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 2.9% | -0.6% | | 2.7% | -- |
| 1997-2012 | 1.9% | -1.5% | | 1.7% | -- |
| 2002-2012 | 0.2% | -4.5% | | 0.0% | -- |
| 2007-2012 | 0.7% | -11.8% | | 0.1% | -- |
| 2012-2017 | 0.2% | 8.9% | | 0.5% | 0.8% |
| 2012-2022 | 0.5% | 4.8% | | 0.7% | 1.1% |
| 2012-2032 | 0.5% | 2.6% | | 0.6% | 1.0% |
| 2012-2042 | 0.4% | 1.8% | | 0.5% | |

/1 Distribution losses

Table 3.7

Member Forecasts By Class
Wild Rice Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Resale Other</u> | <u>Total Members</u> |
|-------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|---------------------|----------------------|
| 1983 | 7,956 | 1,596 | 8 | 307 | - | 27 | 0 | 9,894 |
| 1984 | 8,087 | 1,609 | 11 | 319 | - | 28 | - | 10,054 |
| 1985 | 8,190 | 1,583 | 10 | 290 | - | 27 | - | 10,099 |
| 1986 | 8,270 | 1,566 | 9 | 295 | - | 27 | - | 10,167 |
| 1987 | 8,400 | 1,588 | 8 | 339 | - | 27 | - | 10,361 |
| 1988 | 8,497 | 1,592 | 10 | 300 | - | 28 | - | 10,428 |
| 1989 | 8,569 | 1,581 | 8 | 298 | - | 29 | - | 10,485 |
| 1990 | 8,672 | 1,530 | 8 | 311 | - | 33 | - | 10,554 |
| 1991 | 8,761 | 1,505 | 7 | 318 | - | 38 | - | 10,629 |
| 1992 | 8,875 | 1,486 | 8 | 376 | - | 39 | - | 10,783 |
| 1993 | 9,051 | 1,462 | 13 | 421 | - | 39 | - | 10,985 |
| 1994 | 9,086 | 1,453 | 13 | 473 | - | 39 | - | 11,064 |
| 1995 | 9,243 | 1,430 | 13 | 499 | - | 41 | - | 11,225 |
| 1996 | 9,425 | 1,394 | 13 | 518 | - | 42 | - | 11,391 |
| 1997 | 9,589 | 1,365 | 12 | 540 | 2 | 42 | - | 11,549 |
| 1998 | 9,732 | 1,359 | 12 | 548 | 4 | 43 | - | 11,698 |
| 1999 | 9,902 | 1,387 | 12 | 566 | 4 | 44 | - | 11,915 |
| 2000 | 10,152 | 1,371 | 10 | 585 | 4 | 45 | - | 12,167 |
| 2001 | 10,368 | 1,349 | 11 | 589 | 4 | 45 | - | 12,366 |
| 2002 | 10,595 | 1,313 | 11 | 584 | 4 | 46 | - | 12,553 |
| 2003 | 10,865 | 1,260 | 11 | 592 | 4 | 47 | - | 12,778 |
| 2004 | 11,188 | 1,164 | 10 | 601 | 4 | 49 | - | 13,016 |
| 2005 | 11,446 | 1,050 | 11 | 573 | 4 | 48 | - | 13,133 |
| 2006 | 12,476 | 166 | 11 | 595 | 4 | 48 | - | 13,300 |
| 2007 | 12,842 | - | 10 | 609 | 4 | 49 | - | 13,514 |
| 2008 | 12,933 | - | 10 | 623 | 5 | 49 | - | 13,620 |
| 2009 | 12,965 | - | 11 | 644 | 5 | 47 | - | 13,672 |
| 2010 | 13,000 | - | 11 | 654 | 5 | 47 | - | 13,718 |
| 2011 | 13,039 | - | 11 | 664 | 7 | 47 | - | 13,769 |
| 2012 | 13,090 | - | 11 | 673 | 7 | 47 | - | 13,828 |
| 2013 | 13,125 | - | 15 | 680 | 7 | 47 | - | 13,874 |
| 2014 | 13,160 | - | 15 | 689 | 7 | 47 | - | 13,919 |
| 2015 | 13,195 | - | 15 | 694 | 7 | 47 | - | 13,958 |
| 2016 | 13,230 | - | 15 | 699 | 8 | 47 | - | 13,999 |
| 2017 | 13,265 | - | 15 | 704 | 8 | 47 | - | 14,039 |
| 2018 | 13,300 | - | 16 | 709 | 8 | 47 | - | 14,080 |
| 2019 | 13,335 | - | 17 | 714 | 8 | 47 | - | 14,121 |
| 2020 | 13,370 | - | 18 | 719 | 8 | 47 | - | 14,162 |
| 2021 | 13,405 | - | 19 | 724 | 8 | 47 | - | 14,203 |
| 2022 | 13,440 | - | 20 | 729 | 8 | 47 | - | 14,244 |
| 2023 | 13,475 | - | 20 | 734 | 8 | 47 | - | 14,284 |
| 2024 | 13,510 | - | 20 | 739 | 8 | 47 | - | 14,324 |
| 2025 | 13,545 | - | 20 | 744 | 8 | 47 | - | 14,364 |
| 2026 | 13,580 | - | 20 | 749 | 8 | 47 | - | 14,404 |
| 2027 | 13,615 | - | 20 | 754 | 8 | 47 | - | 14,444 |
| 2028 | 13,650 | - | 20 | 759 | 8 | 47 | - | 14,484 |
| 2029 | 13,685 | - | 20 | 764 | 8 | 47 | - | 14,524 |
| 2030 | 13,720 | - | 20 | 769 | 8 | 47 | - | 14,564 |
| 2031 | 13,755 | - | 20 | 774 | 8 | 47 | - | 14,604 |
| 2032 | 13,790 | - | 20 | 779 | 8 | 47 | - | 14,644 |
| 2033 | 13,825 | - | 20 | 784 | 8 | 47 | - | 14,684 |
| 2034 | 13,860 | - | 20 | 789 | 8 | 47 | - | 14,724 |
| 2035 | 13,895 | - | 20 | 794 | 8 | 47 | - | 14,764 |
| 2036 | 13,930 | - | 20 | 799 | 8 | 47 | - | 14,804 |
| 2037 | 13,965 | - | 20 | 804 | 8 | 47 | - | 14,844 |
| 2038 | 14,000 | - | 20 | 809 | 8 | 47 | - | 14,884 |
| 2039 | 14,035 | - | 20 | 814 | 8 | 47 | - | 14,924 |
| 2040 | 14,070 | - | 20 | 819 | 8 | 47 | - | 14,964 |
| 2041 | 14,105 | - | 20 | 824 | 8 | 47 | - | 15,004 |
| 2042 | 14,140 | - | 20 | 829 | 8 | 47 | - | 15,044 |

Average Annual Growth Rates

| | | | | | | | | |
|-----------|------|---------|------|------|-------|-------|---------|------|
| 1983-2012 | 1.7% | -100.0% | 1.1% | 2.7% | -- | 2.0% | -100.0% | 1.2% |
| 1997-2012 | 2.0% | -100.0% | 1.9% | 3.0% | -- | 0.9% | -- | 1.3% |
| 2002-2012 | 2.1% | -100.0% | 0.0% | 1.4% | 5.8% | 0.2% | -- | 1.0% |
| 2007-2012 | 0.4% | -- | 1.9% | 2.0% | 11.8% | -0.8% | -- | 0.5% |
| 2012-2017 | 0.3% | -- | 6.4% | 0.9% | 2.7% | 0.0% | -- | 0.3% |
| 2012-2022 | 0.3% | -- | 6.2% | 0.8% | 1.3% | 0.0% | -- | 0.3% |
| 2012-2032 | 0.3% | -- | 3.0% | 0.7% | 0.7% | 0.0% | -- | 0.3% |
| 2012-2042 | 0.3% | -- | 2.0% | 0.7% | 0.4% | 0.0% | -- | 0.3% |

Table 3.8

Energy Forecasts By Class (kWh)
Wild Rice Electric Cooperative, Inc.

| <u>Year</u> | <u>Residential</u> | <u>Seasonal</u> | <u>Irrigation</u> | <u>General Commercial</u> | <u>Large Commercial</u> | <u>Street Lighting</u> | <u>Resale Other</u> | <u>Total kWh Sales</u> |
|-----------------------------|--------------------|-----------------|-------------------|---------------------------|-------------------------|------------------------|---------------------|------------------------|
| 1983 | 116,036,983 | 1,993,796 | 457,491 | 9,985,656 | - | 365,928 | 104,613 | 128,944,467 |
| 1984 | 121,446,862 | 1,751,537 | 478,820 | 10,951,861 | - | 378,012 | - | 135,007,092 |
| 1985 | 123,590,878 | 1,886,050 | 31,250 | 7,434,350 | - | 372,026 | - | 133,314,554 |
| 1986 | 124,370,875 | 1,909,140 | 121,559 | 7,739,959 | - | 367,281 | - | 134,508,814 |
| 1987 | 118,316,611 | 2,032,913 | 354,917 | 11,153,431 | - | 364,069 | - | 132,221,941 |
| 1988 | 127,142,181 | 2,023,620 | 30,409 | 7,913,994 | - | 365,383 | - | 137,475,587 |
| 1989 | 132,096,988 | 2,068,755 | 180,970 | 7,936,754 | - | 342,680 | - | 142,626,147 |
| 1990 | 131,222,700 | 2,132,810 | 163,140 | 8,539,781 | - | 372,537 | - | 142,430,968 |
| 1991 | 137,299,431 | 2,155,980 | 75,100 | 8,975,302 | - | 434,441 | - | 148,940,254 |
| 1992 | 138,814,342 | 2,196,667 | 116,369 | 16,365,051 | - | 473,486 | - | 157,965,915 |
| 1993 | 145,664,334 | 2,089,983 | 79,246 | 17,035,189 | - | 603,980 | - | 165,472,732 |
| 1994 | 145,791,270 | 2,025,390 | 79,040 | 18,431,586 | - | 585,512 | - | 166,912,798 |
| 1995 | 152,479,448 | 2,108,100 | 201,288 | 18,939,799 | - | 548,085 | - | 174,276,720 |
| 1996 | 165,429,549 | 2,114,750 | 136,572 | 21,936,642 | - | 570,711 | - | 190,188,224 |
| 1997 | 160,780,974 | 2,191,130 | 62,445 | 21,497,224 | 925,160 | 587,256 | - | 186,044,189 |
| 1998 | 151,597,904 | 2,166,394 | 129,141 | 22,835,426 | 2,255,120 | 612,873 | - | 179,596,858 |
| 1999 | 157,029,705 | 2,245,511 | 100,034 | 23,770,225 | 6,039,140 | 640,195 | - | 189,824,810 |
| 2000 | 164,191,751 | 2,279,368 | 521,855 | 23,253,102 | 6,341,160 | 646,590 | - | 197,233,826 |
| 2001 | 173,383,260 | 2,412,957 | 195,392 | 22,503,954 | 6,936,120 | 660,964 | - | 206,092,647 |
| 2002 | 180,521,087 | 2,484,684 | 120,755 | 24,137,670 | 6,732,720 | 665,760 | - | 214,662,676 |
| 2003 | 182,318,567 | 2,364,213 | 168,157 | 25,164,504 | 5,734,000 | 621,815 | - | 216,371,256 |
| 2004 | 191,412,574 | 2,474,037 | 155,930 | 25,440,630 | 7,129,440 | 590,493 | - | 227,203,104 |
| 2005 | 193,824,490 | 2,208,657 | 311,822 | 27,394,274 | 6,952,120 | 621,933 | - | 231,313,296 |
| 2006 | 197,008,411 | 3,473 | 245,100 | 26,696,744 | 6,303,900 | 598,532 | - | 230,856,160 |
| 2007 | 209,154,512 | - | 161,421 | 29,748,249 | 6,607,880 | 575,718 | - | 246,247,780 |
| 2008 | 223,807,332 | - | 95,254 | 29,310,156 | 8,105,760 | 575,919 | - | 261,894,421 |
| 2009 | 225,696,505 | - | 145,261 | 36,284,892 | 8,856,980 | 569,473 | - | 271,553,111 |
| 2010 | 210,916,218 | - | 290,308 | 33,653,533 | 8,870,660 | 566,992 | - | 254,297,711 |
| 2011 | 216,062,569 | - | 341,807 | 28,791,673 | 10,937,540 | 556,361 | - | 256,689,950 |
| 2012 | 199,424,140 | - | 410,894 | 28,831,523 | 11,387,840 | 505,079 | - | 240,559,476 |
| 2013 | 201,220,091 | - | 351,507 | 28,377,621 | 11,417,357 | 502,554 | - | 241,869,130 |
| 2014 | 203,140,656 | - | 351,507 | 27,755,061 | 11,447,937 | 500,041 | - | 243,195,202 |
| 2015 | 204,572,388 | - | 351,507 | 27,815,795 | 11,479,605 | 497,541 | - | 244,716,835 |
| 2016 | 204,227,022 | - | 351,507 | 27,971,989 | 12,512,384 | 495,053 | - | 245,557,956 |
| 2017 | 205,575,078 | - | 351,507 | 28,257,996 | 12,546,301 | 492,578 | - | 247,223,459 |
| 2018 | 208,908,655 | - | 374,941 | 28,682,371 | 12,581,382 | 490,115 | - | 251,037,463 |
| 2019 | 210,578,637 | - | 398,374 | 29,116,104 | 12,617,653 | 487,664 | - | 253,198,433 |
| 2020 | 211,668,767 | - | 421,808 | 29,512,091 | 12,655,141 | 485,226 | - | 254,743,034 |
| 2021 | 214,447,197 | - | 445,242 | 30,003,501 | 12,693,876 | 482,800 | - | 258,072,615 |
| 2022 | 218,815,749 | - | 468,676 | 30,543,601 | 12,733,885 | 480,386 | - | 263,042,296 |
| 2023 | 221,031,741 | - | 468,676 | 31,094,158 | 12,775,198 | 477,984 | - | 265,847,756 |
| 2024 | 224,091,733 | - | 468,676 | 31,574,795 | 12,817,845 | 475,594 | - | 269,428,643 |
| 2025 | 226,767,374 | - | 468,676 | 32,053,885 | 12,861,859 | 473,216 | - | 272,625,009 |
| 2026 | 228,940,591 | - | 468,676 | 32,455,202 | 12,907,269 | 470,850 | - | 275,242,588 |
| 2027 | 230,073,041 | - | 468,676 | 32,790,107 | 12,954,110 | 468,496 | - | 276,754,430 |
| 2028 | 231,177,271 | - | 468,676 | 33,079,808 | 13,002,415 | 466,153 | - | 278,194,323 |
| 2029 | 232,279,051 | - | 468,676 | 33,364,383 | 13,052,218 | 463,822 | - | 279,628,150 |
| 2030 | 233,354,949 | - | 468,676 | 33,648,074 | 13,103,554 | 461,503 | - | 281,036,756 |
| 2031 | 234,438,094 | - | 468,676 | 33,927,553 | 13,156,460 | 459,196 | - | 282,449,978 |
| 2032 | 235,514,867 | - | 468,676 | 34,207,518 | 13,210,972 | 456,900 | - | 283,858,932 |
| 2033 | 236,585,263 | - | 468,676 | 34,487,058 | 13,267,129 | 454,615 | - | 285,262,742 |
| 2034 | 237,684,317 | - | 468,676 | 34,769,532 | 13,324,970 | 452,342 | - | 286,699,838 |
| 2035 | 238,778,424 | - | 468,676 | 35,053,511 | 13,384,535 | 450,080 | - | 288,135,226 |
| 2036 | 239,885,546 | - | 468,676 | 35,337,258 | 13,445,864 | 447,830 | - | 289,585,174 |
| 2037 | 240,995,976 | - | 468,676 | 35,619,623 | 13,509,001 | 445,591 | - | 291,038,866 |
| 2038 | 242,110,044 | - | 468,676 | 35,901,217 | 13,573,987 | 443,363 | - | 292,497,287 |
| 2039 | 243,229,984 | - | 468,676 | 36,183,208 | 13,640,867 | 441,146 | - | 293,963,881 |
| 2040 | 244,355,277 | - | 468,676 | 36,463,234 | 13,709,687 | 438,940 | - | 295,435,813 |
| 2041 | 245,471,872 | - | 468,676 | 36,742,086 | 13,780,492 | 436,746 | - | 296,899,872 |
| 2042 | 246,583,161 | - | 468,676 | 37,019,680 | 13,853,331 | 434,562 | - | 298,359,410 |
| Average Annual Growth Rates | | | | | | | | |
| 1983-2012 | 1.9% | -100.0% | -0.4% | 3.7% | -- | 1.1% | -100.0% | 2.2% |
| 1997-2012 | 1.8% | -100.0% | 6.5% | 2.9% | -- | 0.3% | -- | 2.1% |
| 2002-2012 | 1.0% | -100.0% | 13.0% | 1.8% | 5.4% | -2.7% | -- | 1.1% |
| 2007-2012 | -0.9% | -- | 20.5% | -0.6% | 11.5% | -2.6% | -- | -0.5% |
| 2012-2017 | 0.6% | -- | -3.1% | -0.4% | 2.0% | -0.5% | -- | 0.5% |
| 2012-2022 | 0.9% | -- | 1.3% | 0.6% | 1.1% | -0.5% | -- | 0.9% |
| 2012-2032 | 0.8% | -- | 0.7% | 0.9% | 0.7% | -0.5% | -- | 0.8% |
| 2012-2042 | 0.7% | -- | 0.4% | 0.8% | 0.7% | -0.5% | -- | 0.7% |

Table 3.9

Energy Requirements Forecast (kWh)
Wild Rice Electric Cooperative, Inc.

| Year | Sales to | Own-Use | Own-Use | Total | For Comparison 2011 Forecast kWh |
|-----------------------------|-------------|------------|------------|-------------|---|
| | Members | and Losses | and Losses | Energy | |
| | kWh | kWh /1 | % /1 | kWh | |
| 1983 | 128,944,467 | 14,183,373 | 9.9% | 143,127,840 | |
| 1984 | 135,007,092 | 13,154,148 | 8.9% | 148,161,240 | |
| 1985 | 133,314,554 | 18,972,286 | 12.5% | 152,286,840 | |
| 1986 | 134,508,814 | 15,041,906 | 10.1% | 149,550,720 | |
| 1987 | 132,221,941 | 12,409,739 | 8.6% | 144,631,680 | |
| 1988 | 137,475,587 | 19,149,013 | 12.2% | 156,624,600 | |
| 1989 | 142,626,147 | 21,318,213 | 13.0% | 163,944,360 | |
| 1990 | 142,430,968 | 14,584,733 | 9.3% | 157,015,701 | |
| 1991 | 148,940,254 | 20,314,826 | 12.0% | 169,255,080 | |
| 1992 | 157,965,915 | 11,103,470 | 6.6% | 169,069,385 | |
| 1993 | 165,472,732 | 13,416,242 | 7.5% | 178,888,974 | |
| 1994 | 166,912,798 | 16,457,970 | 9.0% | 183,370,768 | |
| 1995 | 174,276,720 | 16,768,244 | 8.8% | 191,044,964 | |
| 1996 | 190,188,224 | 13,455,230 | 6.6% | 203,643,454 | |
| 1997 | 186,044,189 | 17,887,677 | 8.8% | 203,931,866 | |
| 1998 | 179,596,858 | 12,605,604 | 6.6% | 192,202,462 | |
| 1999 | 189,824,810 | 17,156,972 | 8.3% | 206,981,782 | |
| 2000 | 197,233,826 | 16,179,318 | 7.6% | 213,413,144 | |
| 2001 | 206,092,647 | 15,454,714 | 7.0% | 221,547,361 | |
| 2002 | 214,662,676 | 20,580,580 | 8.7% | 235,243,256 | |
| 2003 | 216,371,256 | 19,287,764 | 8.2% | 235,659,020 | |
| 2004 | 227,203,104 | 11,398,011 | 4.8% | 238,601,115 | |
| 2005 | 231,313,296 | 17,995,953 | 7.2% | 249,309,249 | |
| 2006 | 230,856,160 | 20,685,451 | 8.2% | 251,541,611 | |
| 2007 | 246,247,780 | 20,092,446 | 7.5% | 266,340,226 | |
| 2008 | 261,894,421 | 22,966,271 | 8.1% | 284,860,692 | |
| 2009 | 271,553,111 | 24,933,943 | 8.4% | 296,487,054 | |
| 2010 | 254,297,711 | 23,387,470 | 8.4% | 277,685,181 | |
| 2011 | 256,689,950 | 22,906,816 | 8.2% | 279,596,766 | 280,959,715 |
| 2012 | 240,559,476 | 19,515,970 | 7.5% | 260,075,446 | 279,241,187 |
| 2013 | 241,869,130 | 20,319,629 | 7.8% | 262,188,758 | 287,323,423 |
| 2014 | 243,195,202 | 20,431,033 | 7.8% | 263,626,235 | 293,257,476 |
| 2015 | 244,716,835 | 20,558,867 | 7.8% | 265,275,702 | 297,667,697 |
| 2016 | 245,557,956 | 20,629,530 | 7.8% | 266,187,486 | 302,121,486 |
| 2017 | 247,223,459 | 20,769,451 | 7.8% | 267,992,910 | 306,976,980 |
| 2018 | 251,037,463 | 21,089,868 | 7.8% | 272,127,331 | 313,247,314 |
| 2019 | 253,198,433 | 21,271,413 | 7.8% | 274,469,846 | 320,131,397 |
| 2020 | 254,743,034 | 21,401,176 | 7.8% | 276,144,210 | 326,542,039 |
| 2021 | 258,072,615 | 21,680,897 | 7.8% | 279,753,512 | 333,336,519 |
| 2022 | 263,042,296 | 22,098,404 | 7.8% | 285,140,700 | 344,916,368 |
| 2023 | 265,847,756 | 22,334,093 | 7.8% | 288,181,850 | 354,221,845 |
| 2024 | 269,428,643 | 22,634,927 | 7.8% | 292,063,569 | 361,575,368 |
| 2025 | 272,625,009 | 22,903,456 | 7.8% | 295,528,465 | 367,609,904 |
| 2026 | 275,242,588 | 23,123,361 | 7.8% | 298,365,949 | 373,706,990 |
| 2027 | 276,754,430 | 23,250,372 | 7.8% | 300,004,802 | 379,805,028 |
| 2028 | 278,194,323 | 23,371,339 | 7.8% | 301,565,662 | 385,895,649 |
| 2029 | 279,628,150 | 23,491,796 | 7.8% | 303,119,946 | 391,989,565 |
| 2030 | 281,036,756 | 23,610,134 | 7.8% | 304,646,890 | 398,104,958 |
| 2031 | 282,449,978 | 23,728,860 | 7.8% | 306,178,838 | 404,232,492 |
| 2032 | 283,858,932 | 23,847,227 | 7.8% | 307,706,160 | 410,356,320 |
| 2033 | 285,262,742 | 23,965,163 | 7.8% | 309,227,904 | 416,450,941 |
| 2034 | 286,699,838 | 24,085,894 | 7.8% | 310,785,732 | 422,573,443 |
| 2035 | 288,135,226 | 24,206,482 | 7.8% | 312,341,709 | 428,730,815 |
| 2036 | 289,585,174 | 24,328,294 | 7.8% | 313,913,468 | 434,907,012 |
| 2037 | 291,038,866 | 24,450,420 | 7.8% | 315,489,286 | 441,116,407 |
| 2038 | 292,497,287 | 24,572,943 | 7.8% | 317,070,230 | 447,313,726 |
| 2039 | 293,963,881 | 24,696,153 | 7.8% | 318,660,033 | 453,543,901 |
| 2040 | 295,435,813 | 24,819,811 | 7.8% | 320,255,624 | 459,768,665 |
| 2041 | 296,899,872 | 24,942,808 | 7.8% | 321,842,680 | |
| 2042 | 298,359,410 | 25,065,425 | 7.8% | 323,424,834 | |
| Average Annual Growth Rates | | | | | |
| 1983-2012 | 2.2% | 1.1% | | 2.1% | -- |
| 1997-2012 | 2.1% | 2.9% | | 2.2% | -- |
| 2002-2012 | 1.1% | -0.5% | | 1.0% | -- |
| 2007-2012 | -0.5% | -0.6% | | -0.5% | -- |
| 2012-2017 | 0.5% | 1.3% | | 0.6% | 1.9% |
| 2012-2022 | 0.9% | 1.3% | | 0.9% | 2.1% |
| 2012-2032 | 0.8% | 1.0% | | 0.8% | 1.9% |
| 2012-2042 | 0.7% | 0.8% | | 0.7% | |

/1 Distribution losses

NMPA Retail Energy Sales By Member (MWh)

| Year | Bagley, MN | Baudette, MN | Fosston, MN | Grafton, ND | Halstad, MN | Hawley, MN | Park River, ND | Roseau, MN | Stephen, MN | Thief River Falls, MN | Warren, MN | Warroad, MN | NMPA |
|-----------------------------|---------------|-----------------|----------------|----------------|----------------|---------------|-------------------|---------------|----------------|--------------------------|---------------|----------------|---------|
| 1995 | 21,124 | 19,142 | 26,809 | 65,245 | 8,170 | 14,969 | 18,727 | 39,133 | 10,050 | 115,642 | 17,354 | 50,704 | 407,069 |
| 1996 | 23,326 | 20,107 | 26,193 | 62,706 | 9,209 | 15,262 | 19,653 | 39,650 | 10,815 | 122,630 | 18,256 | 52,214 | 420,021 |
| 1997 | 23,641 | 20,592 | 26,660 | 47,749 | 8,095 | 15,163 | 20,868 | 40,972 | 9,807 | 120,417 | 17,252 | 51,776 | 402,992 |
| 1998 | 21,713 | 21,026 | 27,225 | 61,595 | 7,934 | 15,778 | 19,740 | 38,701 | 8,560 | 116,892 | 17,015 | 51,452 | 407,631 |
| 1999 | 22,933 | 20,865 | 29,364 | 66,267 | 8,013 | 16,648 | 19,723 | 40,610 | 9,299 | 119,066 | 16,116 | 53,043 | 421,947 |
| 2000 | 24,063 | 17,245 | 30,577 | 65,699 | 8,784 | 16,714 | 20,798 | 40,673 | 9,347 | 119,230 | 17,864 | 52,756 | 423,750 |
| 2001 | 25,593 | 22,591 | 29,930 | 67,476 | 9,084 | 17,030 | 20,190 | 41,830 | 9,340 | 126,536 | 15,526 | 54,083 | 439,209 |
| 2002 | 26,166 | 23,227 | 31,912 | 66,910 | 9,228 | 17,855 | 20,283 | 41,671 | 9,903 | 130,934 | 17,255 | 55,130 | 450,474 |
| 2003 | 26,166 | 22,774 | 31,829 | 67,233 | 9,142 | 17,422 | 19,633 | 41,996 | 9,000 | 130,934 | 18,318 | 54,284 | 448,731 |
| 2004 | 26,215 | 22,772 | 32,725 | 68,343 | 9,094 | 17,316 | 18,946 | 42,302 | 8,877 | 134,690 | 16,935 | 56,212 | 454,427 |
| 2005 | 26,559 | 22,406 | 32,894 | 68,360 | 8,929 | 18,555 | 19,311 | 41,592 | 8,909 | 138,646 | 14,361 | 56,875 | 457,397 |
| 2006 | 27,249 | 22,440 | 31,478 | 69,061 | 8,352 | 18,485 | 17,644 | 42,163 | 7,817 | 142,183 | 17,556 | 58,398 | 462,825 |
| 2007 | 27,234 | 22,412 | 33,907 | 67,322 | 8,725 | 19,684 | 16,827 | 43,221 | 8,288 | 140,845 | 17,270 | 59,130 | 464,865 |
| 2008 | 27,920 | 22,550 | 34,531 | 55,847 | 9,116 | 20,634 | 20,626 | 44,275 | 9,143 | 140,897 | 14,806 | 58,526 | 458,871 |
| 2009 | 27,005 | 22,250 | 33,986 | 53,876 | 9,588 | 20,396 | 19,055 | 41,389 | 9,443 | 139,854 | 17,473 | 55,606 | 449,921 |
| 2010 | 26,167 | 21,796 | 32,558 | 52,628 | 9,256 | 20,294 | 19,696 | 42,525 | 9,186 | 137,153 | 16,307 | 54,216 | 441,782 |
| 2011 | 26,874 | 23,035 | 31,523 | 52,645 | 9,236 | 19,718 | 19,587 | 42,134 | 8,866 | 138,936 | 15,351 | 54,522 | 442,428 |
| 2012 | 25,554 | 21,033 | 31,440 | 50,365 | 8,311 | 19,017 | 18,807 | 40,255 | 8,395 | 134,870 | 13,201 | 51,626 | 422,875 |
| 2013 | 27,073 | 21,740 | 32,375 | 51,878 | 8,875 | 20,539 | 19,733 | 40,652 | 8,594 | 137,762 | 15,225 | 52,764 | 437,210 |
| 2014 | 27,484 | 21,802 | 32,402 | 52,232 | 8,897 | 21,009 | 19,782 | 41,371 | 8,613 | 138,451 | 15,318 | 53,886 | 441,248 |
| 2015 | 28,017 | 21,867 | 32,682 | 52,589 | 8,924 | 21,477 | 19,836 | 41,543 | 8,590 | 139,143 | 15,319 | 54,357 | 444,344 |
| 2016 | 28,507 | 21,923 | 32,982 | 52,949 | 8,955 | 21,939 | 19,892 | 41,735 | 8,562 | 139,839 | 15,327 | 54,830 | 447,438 |
| 2017 | 28,973 | 21,985 | 33,300 | 53,312 | 8,988 | 22,385 | 19,945 | 41,928 | 8,518 | 140,538 | 15,338 | 55,261 | 450,469 |
| 2018 | 29,385 | 22,038 | 33,621 | 53,679 | 9,022 | 22,824 | 20,007 | 42,122 | 8,461 | 141,240 | 15,351 | 55,658 | 453,409 |
| 2019 | 29,756 | 22,099 | 33,943 | 54,049 | 9,059 | 23,252 | 20,067 | 42,314 | 8,394 | 141,947 | 15,366 | 56,027 | 456,273 |
| 2020 | 30,114 | 22,156 | 34,273 | 54,422 | 9,097 | 23,677 | 20,129 | 42,506 | 8,320 | 142,656 | 15,383 | 56,372 | 459,106 |
| 2021 | 30,463 | 22,214 | 34,610 | 54,798 | 9,136 | 24,104 | 20,197 | 42,700 | 8,245 | 143,370 | 15,400 | 56,713 | 461,950 |
| 2022 | 30,781 | 22,272 | 34,948 | 55,178 | 9,177 | 24,520 | 20,262 | 42,887 | 8,157 | 144,086 | 15,418 | 57,014 | 464,700 |
| 2023 | 31,059 | 22,327 | 35,286 | 55,562 | 9,219 | 24,932 | 20,334 | 43,072 | 8,063 | 144,807 | 15,436 | 57,293 | 467,389 |
| 2024 | 31,325 | 22,383 | 35,628 | 55,948 | 9,263 | 25,343 | 20,404 | 43,257 | 7,964 | 145,531 | 15,455 | 57,558 | 470,058 |
| 2025 | 31,578 | 22,445 | 35,975 | 56,338 | 9,308 | 25,755 | 20,478 | 43,441 | 7,865 | 146,259 | 15,474 | 57,812 | 472,728 |
| 2026 | 31,822 | 22,500 | 36,329 | 56,731 | 9,354 | 26,171 | 20,559 | 43,628 | 7,761 | 146,990 | 15,494 | 58,062 | 475,402 |
| 2027 | 32,069 | 22,559 | 36,692 | 57,128 | 9,402 | 26,588 | 20,635 | 43,816 | 7,655 | 147,725 | 15,514 | 58,307 | 478,089 |
| 2028 | 32,304 | 22,613 | 37,059 | 57,529 | 9,451 | 27,009 | 20,720 | 44,004 | 7,548 | 148,463 | 15,534 | 58,541 | 480,776 |
| 2029 | 32,544 | 22,671 | 37,437 | 57,933 | 9,501 | 27,437 | 20,801 | 44,196 | 7,438 | 149,206 | 15,555 | 58,779 | 483,499 |
| 2030 | 32,774 | 22,728 | 37,822 | 58,341 | 9,553 | 27,865 | 20,890 | 44,389 | 7,330 | 149,952 | 15,575 | 59,013 | 486,230 |
| 2031 | 32,994 | 22,791 | 38,214 | 58,753 | 9,606 | 28,294 | 20,980 | 44,584 | 7,218 | 150,702 | 15,597 | 59,243 | 488,975 |
| 2032 | 33,231 | 22,848 | 38,616 | 59,171 | 9,661 | 28,733 | 21,071 | 44,780 | 7,106 | 151,455 | 15,618 | 59,469 | 491,759 |
| 2033 | 33,459 | 22,907 | 39,025 | 59,591 | 9,718 | 29,178 | 21,163 | 44,980 | 6,997 | 152,212 | 15,639 | 59,701 | 494,572 |
| 2034 | 33,693 | 22,967 | 39,446 | 60,016 | 9,776 | 29,629 | 21,258 | 45,184 | 6,885 | 152,973 | 15,661 | 59,936 | 497,425 |
| 2035 | 33,918 | 23,030 | 39,874 | 60,446 | 9,835 | 30,090 | 21,360 | 45,393 | 6,777 | 153,738 | 15,684 | 60,178 | 500,323 |
| 2036 | 34,163 | 23,092 | 40,315 | 60,880 | 9,897 | 30,562 | 21,458 | 45,606 | 6,666 | 154,507 | 15,706 | 60,428 | 503,280 |
| 2037 | 34,427 | 23,156 | 40,769 | 61,320 | 9,960 | 31,041 | 21,565 | 45,824 | 6,560 | 155,279 | 15,729 | 60,689 | 506,318 |
| 2038 | 34,699 | 23,221 | 41,235 | 61,764 | 10,024 | 31,531 | 21,672 | 46,051 | 6,460 | 156,056 | 15,752 | 60,968 | 509,433 |
| 2039 | 34,991 | 23,285 | 41,715 | 62,215 | 10,091 | 32,039 | 21,781 | 46,285 | 6,360 | 156,836 | 15,775 | 61,268 | 512,642 |
| 2040 | 35,304 | 23,358 | 42,208 | 62,669 | 10,159 | 32,556 | 21,894 | 46,527 | 6,264 | 157,620 | 15,799 | 61,586 | 515,944 |
| 2041 | 35,623 | 23,431 | 42,713 | 63,131 | 10,229 | 33,080 | 22,009 | 46,774 | 6,167 | 158,408 | 15,823 | 61,909 | 519,298 |
| 2042 | 35,947 | 23,505 | 43,228 | 63,598 | 10,301 | 33,612 | 22,129 | 47,024 | 6,072 | 159,200 | 15,847 | 62,237 | 522,700 |
| Average Annual Growth Rates | | | | | | | | | | | | | |
| 1997-2012 | 0.5% | 0.1% | 1.1% | 0.4% | 0.2% | 1.5% | -0.7% | -0.1% | -1.0% | 0.8% | -1.8% | 0.0% | 0.3% |
| 2002-2012 | -0.2% | -1.0% | -0.1% | -2.8% | -1.0% | 0.6% | -0.8% | -0.3% | -1.6% | 0.3% | -2.6% | -0.7% | -0.6% |
| 2007-2012 | -1.3% | -1.3% | -1.5% | -5.6% | -1.0% | -0.7% | 2.2% | -1.4% | 0.3% | -0.9% | -5.2% | -2.7% | -1.9% |
| 2012-2017 | 2.5% | 0.9% | 1.2% | 1.1% | 1.6% | 3.3% | 1.2% | 0.8% | 0.3% | 0.8% | 3.0% | 1.4% | 1.3% |
| 2012-2022 | 1.9% | 0.6% | 1.1% | 0.9% | 1.0% | 2.6% | 0.7% | 0.6% | -0.3% | 0.7% | 1.6% | 1.0% | 0.9% |
| 2012-2032 | 1.3% | 0.4% | 1.0% | 0.8% | 0.8% | 2.1% | 0.6% | 0.5% | -0.8% | 0.6% | 0.8% | 0.7% | 0.8% |
| 2012-2042 | 1.1% | 0.4% | 1.1% | 0.8% | 0.7% | 1.9% | 0.5% | 0.5% | -1.1% | 0.6% | 0.6% | 0.6% | 0.7% |
| 2013-2042 | 1.0% | 0.3% | 1.0% | 0.7% | 0.5% | 1.7% | 0.4% | 0.5% | -1.2% | 0.5% | 0.1% | 0.6% | 0.6% |

NMPA Energy Purchases By Member (MWh)

| Year | Bagley, MN | Baudette, MN | Fosston, MN | Grafton, ND | Halstad, MN | Hawley, MN | Park River, ND | Roseau, MN | Stephen, MN | Thief River Falls, MN | Warren, MN | Warroad, MN | NMPA |
|------|---------------|-----------------|----------------|----------------|----------------|---------------|-------------------|---------------|----------------|--------------------------|---------------|----------------|---------|
| 1995 | 22,443 | 20,119 | 31,150 | 69,171 | 8,826 | 16,045 | 21,500 | 40,813 | 10,551 | 117,254 | 19,022 | 51,741 | 428,635 |
| 1996 | 24,285 | 21,118 | 30,695 | 70,704 | 9,475 | 16,394 | 21,587 | 42,739 | 11,123 | 124,458 | 20,044 | 53,460 | 446,082 |
| 1997 | 25,271 | 21,786 | 31,788 | 58,422 | 9,202 | 16,283 | 21,537 | 42,718 | 10,497 | 123,177 | 19,424 | 52,720 | 432,825 |
| 1998 | 24,245 | 21,903 | 30,375 | 68,321 | 8,498 | 16,750 | 19,740 | 40,595 | 8,993 | 117,664 | 17,740 | 52,613 | 427,437 |
| 1999 | 25,135 | 22,355 | 33,205 | 70,763 | 8,903 | 18,040 | 20,238 | 41,712 | 9,812 | 121,545 | 17,432 | 53,234 | 442,374 |
| 2000 | 25,544 | 22,661 | 33,167 | 71,237 | 9,307 | 18,104 | 20,798 | 42,551 | 9,882 | 120,654 | 17,487 | 53,729 | 445,121 |
| 2001 | 27,109 | 23,726 | 34,168 | 72,557 | 9,491 | 18,394 | 20,189 | 44,257 | 9,866 | 126,388 | 18,037 | 55,775 | 459,957 |
| 2002 | 27,917 | 24,292 | 34,974 | 73,460 | 9,698 | 18,880 | 20,283 | 45,148 | 10,331 | 134,121 | 18,637 | 55,164 | 472,905 |
| 2003 | 28,037 | 23,944 | 34,815 | 73,889 | 9,664 | 18,615 | 19,633 | 43,662 | 9,593 | 138,094 | 18,657 | 55,206 | 473,809 |
| 2004 | 28,332 | 23,728 | 35,408 | 74,333 | 9,421 | 18,481 | 18,946 | 43,962 | 9,383 | 136,171 | 18,380 | 57,252 | 473,797 |
| 2005 | 29,035 | 23,573 | 35,109 | 73,643 | 9,367 | 19,612 | 19,311 | 43,851 | 9,383 | 139,333 | 19,135 | 58,286 | 479,640 |
| 2006 | 29,640 | 23,409 | 33,866 | 74,737 | 9,169 | 20,186 | 19,393 | 43,844 | 8,299 | 144,053 | 19,057 | 59,563 | 485,217 |
| 2007 | 29,659 | 23,578 | 35,976 | 74,418 | 9,645 | 20,938 | 20,291 | 45,147 | 8,763 | 145,384 | 19,386 | 60,048 | 493,233 |
| 2008 | 30,362 | 23,821 | 36,976 | 61,688 | 10,166 | 21,707 | 20,994 | 46,205 | 9,635 | 145,539 | 19,723 | 59,746 | 486,562 |
| 2009 | 29,591 | 23,408 | 36,616 | 60,339 | 10,060 | 21,471 | 21,374 | 45,723 | 9,889 | 139,979 | 19,528 | 56,690 | 474,666 |
| 2010 | 28,391 | 22,726 | 35,145 | 58,744 | 9,601 | 21,085 | 20,614 | 44,062 | 9,544 | 137,743 | 18,922 | 54,850 | 461,427 |
| 2011 | 28,769 | 22,285 | 33,753 | 57,925 | 9,563 | 20,720 | 20,404 | 43,585 | 9,515 | 138,698 | 19,032 | 55,535 | 459,785 |
| 2012 | 27,757 | 22,153 | 33,527 | 57,351 | 8,846 | 20,239 | 19,944 | 41,924 | 9,046 | 138,887 | 18,288 | 52,912 | 450,875 |
| 2013 | 29,374 | 22,472 | 34,739 | 57,877 | 9,408 | 21,599 | 20,855 | 42,760 | 9,090 | 139,581 | 18,848 | 53,770 | 460,374 |
| 2014 | 29,821 | 22,537 | 34,768 | 58,272 | 9,431 | 22,093 | 20,907 | 43,516 | 9,109 | 140,279 | 18,963 | 54,914 | 464,611 |
| 2015 | 30,399 | 22,603 | 35,068 | 58,670 | 9,460 | 22,585 | 20,964 | 43,697 | 9,086 | 140,980 | 18,965 | 55,394 | 467,871 |
| 2016 | 30,930 | 22,661 | 35,390 | 59,072 | 9,492 | 23,072 | 21,022 | 43,899 | 9,055 | 141,685 | 18,974 | 55,876 | 471,129 |
| 2017 | 31,436 | 22,725 | 35,731 | 59,477 | 9,527 | 23,540 | 21,079 | 44,103 | 9,009 | 142,394 | 18,987 | 56,315 | 474,323 |
| 2018 | 31,883 | 22,780 | 36,076 | 59,886 | 9,564 | 24,002 | 21,145 | 44,306 | 8,948 | 143,106 | 19,004 | 56,720 | 477,420 |
| 2019 | 32,285 | 22,843 | 36,422 | 60,299 | 9,603 | 24,452 | 21,208 | 44,509 | 8,877 | 143,821 | 19,023 | 57,096 | 480,438 |
| 2020 | 32,675 | 22,903 | 36,776 | 60,715 | 9,643 | 24,899 | 21,273 | 44,710 | 8,800 | 144,540 | 19,043 | 57,447 | 483,424 |
| 2021 | 33,053 | 22,962 | 37,138 | 61,135 | 9,685 | 25,348 | 21,345 | 44,914 | 8,721 | 145,263 | 19,064 | 57,794 | 486,422 |
| 2022 | 33,398 | 23,022 | 37,499 | 61,559 | 9,728 | 25,785 | 21,414 | 45,111 | 8,627 | 145,989 | 19,086 | 58,101 | 489,321 |
| 2023 | 33,700 | 23,079 | 37,862 | 61,987 | 9,772 | 26,219 | 21,490 | 45,306 | 8,527 | 146,719 | 19,109 | 58,386 | 492,156 |
| 2024 | 33,988 | 23,137 | 38,229 | 62,417 | 9,819 | 26,651 | 21,565 | 45,500 | 8,424 | 147,453 | 19,132 | 58,656 | 494,970 |
| 2025 | 34,263 | 23,201 | 38,601 | 62,853 | 9,866 | 27,084 | 21,642 | 45,694 | 8,318 | 148,190 | 19,156 | 58,915 | 497,785 |
| 2026 | 34,527 | 23,258 | 38,982 | 63,291 | 9,915 | 27,522 | 21,728 | 45,891 | 8,208 | 148,931 | 19,180 | 59,170 | 500,604 |
| 2027 | 34,795 | 23,319 | 39,371 | 63,734 | 9,966 | 27,961 | 21,808 | 46,089 | 8,096 | 149,676 | 19,205 | 59,419 | 503,438 |
| 2028 | 35,051 | 23,375 | 39,765 | 64,181 | 10,018 | 28,403 | 21,898 | 46,286 | 7,983 | 150,424 | 19,230 | 59,658 | 506,272 |
| 2029 | 35,311 | 23,435 | 40,171 | 64,632 | 10,071 | 28,853 | 21,983 | 46,488 | 7,867 | 151,176 | 19,256 | 59,900 | 509,144 |
| 2030 | 35,560 | 23,493 | 40,583 | 65,088 | 10,126 | 29,303 | 22,077 | 46,691 | 7,752 | 151,932 | 19,282 | 60,138 | 512,026 |
| 2031 | 35,799 | 23,558 | 41,004 | 65,547 | 10,183 | 29,754 | 22,173 | 46,896 | 7,635 | 152,692 | 19,308 | 60,373 | 514,921 |
| 2032 | 36,057 | 23,618 | 41,435 | 66,013 | 10,241 | 30,216 | 22,269 | 47,102 | 7,516 | 153,455 | 19,334 | 60,603 | 517,860 |
| 2033 | 36,304 | 23,679 | 41,874 | 66,482 | 10,301 | 30,684 | 22,367 | 47,313 | 7,400 | 154,222 | 19,361 | 60,840 | 520,828 |
| 2034 | 36,558 | 23,740 | 42,326 | 66,956 | 10,362 | 31,159 | 22,466 | 47,528 | 7,282 | 154,994 | 19,388 | 61,080 | 523,838 |
| 2035 | 36,802 | 23,806 | 42,785 | 67,435 | 10,425 | 31,643 | 22,574 | 47,747 | 7,168 | 155,769 | 19,416 | 61,326 | 526,896 |
| 2036 | 37,067 | 23,870 | 43,259 | 67,920 | 10,490 | 32,139 | 22,678 | 47,971 | 7,051 | 156,547 | 19,443 | 61,580 | 530,017 |
| 2037 | 37,354 | 23,936 | 43,746 | 68,410 | 10,557 | 32,644 | 22,792 | 48,201 | 6,938 | 157,330 | 19,472 | 61,846 | 533,224 |
| 2038 | 37,649 | 24,003 | 44,246 | 68,906 | 10,626 | 33,159 | 22,904 | 48,439 | 6,832 | 158,117 | 19,500 | 62,131 | 536,512 |
| 2039 | 37,966 | 24,070 | 44,760 | 69,409 | 10,697 | 33,692 | 23,020 | 48,686 | 6,727 | 158,907 | 19,529 | 62,437 | 539,899 |
| 2040 | 38,306 | 24,145 | 45,290 | 69,916 | 10,769 | 34,236 | 23,138 | 48,940 | 6,625 | 159,702 | 19,558 | 62,760 | 543,386 |
| 2041 | 38,651 | 24,221 | 45,832 | 70,431 | 10,843 | 34,788 | 23,261 | 49,200 | 6,523 | 160,500 | 19,588 | 63,090 | 546,927 |
| 2042 | 39,003 | 24,297 | 46,384 | 70,952 | 10,919 | 35,347 | 23,387 | 49,463 | 6,422 | 161,303 | 19,618 | 63,424 | 550,518 |

Average Annual Growth Rates

| | | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1997-2012 | 0.6% | 0.1% | 0.4% | -0.1% | -0.3% | 1.5% | -0.5% | -0.1% | -1.0% | 0.8% | -0.4% | 0.0% | 0.3% |
| 2002-2012 | -0.1% | -0.9% | -0.4% | -2.4% | -0.9% | 0.7% | -0.2% | -0.7% | -1.3% | 0.3% | -0.2% | -0.4% | -0.5% |
| 2007-2012 | -1.3% | -1.2% | -1.4% | -5.1% | -1.7% | -0.7% | -0.3% | -1.5% | 0.6% | -0.9% | -1.2% | -2.5% | -1.8% |
| 2012-2017 | 2.5% | 0.5% | 1.3% | 0.7% | 1.5% | 3.1% | 1.1% | 1.0% | -0.1% | 0.5% | 0.8% | 1.3% | 1.0% |
| 2012-2022 | 1.9% | 0.4% | 1.1% | 0.7% | 1.0% | 2.5% | 0.7% | 0.7% | -0.5% | 0.5% | 0.4% | 0.9% | 0.8% |
| 2012-2032 | 1.3% | 0.3% | 1.1% | 0.7% | 0.7% | 2.0% | 0.6% | 0.6% | -0.9% | 0.5% | 0.3% | 0.7% | 0.7% |
| 2012-2042 | 1.1% | 0.3% | 1.1% | 0.7% | 0.7% | 1.9% | 0.5% | 0.6% | -1.1% | 0.5% | 0.2% | 0.6% | 0.7% |
| 2013-2042 | 1.0% | 0.3% | 1.0% | 0.7% | 0.5% | 1.7% | 0.4% | 0.5% | -1.2% | 0.5% | 0.1% | 0.6% | 0.6% |

NMPA Energy Purchases by State (MWh)
Northern Municipal Power Agency

| <u>Year</u> | <u>Minnesota Members</u> | <u>North Dakota Members</u> | <u>Adjusted Total MWh</u> |
|-------------|------------------------------|-------------------------------------|-----------------------------------|
| 1990 | | | 363,032 |
| 1991 | | | 382,175 |
| 1992 | | | 372,754 |
| 1993 | | | 391,546 |
| 1994 | | | 407,465 |
| 1995 | 337,964 | 90,671 | 428,635 |
| 1996 | 353,791 | 92,291 | 446,082 |
| 1997 | 352,866 | 79,959 | 432,825 |
| 1998 | 339,376 | 88,061 | 427,437 |
| 1999 | 351,373 | 91,001 | 442,374 |
| 2000 | 353,086 | 92,035 | 445,121 |
| 2001 | 367,211 | 92,746 | 459,957 |
| 2002 | 379,162 | 93,743 | 472,905 |
| 2003 | 380,287 | 93,522 | 473,809 |
| 2004 | 380,518 | 93,279 | 473,797 |
| 2005 | 386,686 | 92,955 | 479,640 |
| 2006 | 391,087 | 94,130 | 485,217 |
| 2007 | 398,524 | 94,709 | 493,233 |
| 2008 | 403,880 | 82,682 | 486,562 |
| 2009 | 392,954 | 81,712 | 474,666 |
| 2010 | 382,070 | 79,358 | 461,427 |
| 2011 | 381,455 | 78,330 | 459,785 |
| 2012 | 373,580 | 77,295 | 450,875 |
| 2013 | 381,641 | 78,732 | 460,374 |
| 2014 | 385,432 | 79,179 | 464,611 |
| 2015 | 388,237 | 79,634 | 467,871 |
| 2016 | 391,034 | 80,095 | 471,129 |
| 2017 | 393,768 | 80,556 | 474,323 |
| 2018 | 396,389 | 81,031 | 477,420 |
| 2019 | 398,931 | 81,507 | 480,438 |
| 2020 | 401,435 | 81,989 | 483,424 |
| 2021 | 403,942 | 82,480 | 486,422 |
| 2022 | 406,348 | 82,973 | 489,321 |
| 2023 | 408,680 | 83,476 | 492,156 |
| 2024 | 410,988 | 83,982 | 494,970 |
| 2025 | 413,290 | 84,495 | 497,785 |
| 2026 | 415,585 | 85,019 | 500,604 |
| 2027 | 417,896 | 85,542 | 503,438 |
| 2028 | 420,193 | 86,079 | 506,272 |
| 2029 | 422,529 | 86,616 | 509,144 |
| 2030 | 424,861 | 87,165 | 512,026 |
| 2031 | 427,201 | 87,720 | 514,921 |
| 2032 | 429,577 | 88,282 | 517,860 |
| 2033 | 431,979 | 88,848 | 520,828 |
| 2034 | 434,416 | 89,423 | 523,838 |
| 2035 | 436,886 | 90,010 | 526,896 |
| 2036 | 439,419 | 90,598 | 530,017 |
| 2037 | 442,022 | 91,202 | 533,224 |
| 2038 | 444,702 | 91,810 | 536,512 |
| 2039 | 447,471 | 92,429 | 539,899 |
| 2040 | 450,331 | 93,055 | 543,386 |
| 2041 | 453,235 | 93,691 | 546,927 |
| 2042 | 456,179 | 94,339 | 550,518 |

| Average Annual Growth Rates | | | |
|-----------------------------|-------|-------|-------|
| 1997-2012 | 0.4% | -0.2% | 0.3% |
| 2002-2012 | -0.1% | -1.9% | -0.5% |
| 2007-2012 | -1.3% | -4.0% | -1.8% |
| 2012-2017 | 1.1% | 0.8% | 1.0% |
| 2012-2022 | 0.8% | 0.7% | 0.8% |
| 2012-2032 | 0.7% | 0.7% | 0.7% |
| 2012-2042 | 0.7% | 0.7% | 0.7% |
| 2013-2042 | 0.6% | 0.6% | 0.6% |

Forecast based on individual NMPA member forecasts, aggregated to the NMPA total.

Retail Energy Forecasts (MWh) - CIP Scenario
NMPA

| Year | MN Base Retail Forecast /1 | CIP Requirement Forecast /2 | Adjusted Retail Forecast /3 |
|-------------|---|--|--|
| 1992 | | | |
| 1993 | | | |
| 1994 | | | |
| 1995 | 323,097 | | |
| 1996 | 337,662 | | |
| 1997 | 334,375 | | |
| 1998 | 326,296 | | |
| 1999 | 335,957 | | |
| 2000 | 337,253 | | |
| 2001 | 351,543 | | |
| 2002 | 363,281 | | |
| 2003 | 361,865 | | |
| 2004 | 367,138 | | |
| 2005 | 369,726 | | |
| 2006 | 376,121 | | |
| 2007 | 380,716 | | |
| 2008 | 382,398 | | |
| 2009 | 376,990 | 548 | 377,537 |
| 2010 | 369,458 | 1,956 | 371,414 |
| 2011 | 370,196 | 3,941 | 374,136 |
| 2012 | 353,703 | 6,454 | 360,157 |
| 2013 | 365,598 | 6,583 | 372,181 |
| 2014 | 369,233 | 6,714 | 375,948 |
| 2015 | 371,919 | 6,849 | 378,768 |
| 2016 | 374,597 | 6,986 | 381,582 |
| 2017 | 377,212 | 7,125 | 384,338 |
| 2018 | 379,723 | 7,268 | 386,990 |
| 2019 | 382,157 | 7,413 | 389,570 |
| 2020 | 384,555 | 7,561 | 392,116 |
| 2021 | 386,955 | 7,713 | 394,668 |
| 2022 | 389,259 | 7,867 | 397,126 |
| 2023 | 391,494 | 8,024 | 399,518 |
| 2024 | 393,705 | 8,185 | 401,890 |
| 2025 | 395,912 | 8,349 | 404,260 |
| 2026 | 398,112 | 8,515 | 406,627 |
| 2027 | 400,326 | 8,686 | 409,012 |
| 2028 | 402,527 | 8,859 | 411,387 |
| 2029 | 404,765 | 9,037 | 413,802 |
| 2030 | 407,000 | 9,217 | 416,217 |
| 2031 | 409,242 | 9,402 | 418,643 |
| 2032 | 411,517 | 9,590 | 421,107 |
| 2033 | 413,818 | 9,782 | 423,599 |
| 2034 | 416,151 | 9,977 | 426,128 |
| 2035 | 418,517 | 10,177 | 428,694 |
| 2036 | 420,942 | 10,380 | 431,322 |
| 2037 | 423,433 | 10,588 | 434,021 |
| 2038 | 425,997 | 10,800 | 436,797 |
| 2039 | 428,646 | 11,016 | 439,661 |
| 2040 | 431,382 | 11,236 | 442,618 |
| 2041 | 434,158 | 11,461 | 445,619 |
| 2042 | 436,973 | 11,690 | 448,663 |

Average Annual Growth Rates

| | | | |
|-----------|-------|------|------|
| 1997-2012 | 0.4% | -- | -- |
| 2002-2012 | -0.3% | -- | -- |
| 2007-2012 | -1.5% | -- | -- |
| 2012-2017 | 1.3% | 2.0% | 1.3% |
| 2012-2022 | 1.0% | 2.0% | 1.0% |
| 2012-2032 | 0.8% | 2.0% | 0.8% |
| 2012-2042 | 0.7% | 2.0% | 0.7% |
| 2013-2042 | 0.6% | 2.0% | 0.6% |

/1 Base-case load forecast - member system retail sales - INCLUDES CIP

/2 Annual reduction - 1.5% reduction in 3-Yr moving average for CIP -
Only MN munis adjusted

/3 Forecast EXCLUDES CIP requirement


APPENDIX H

Governing Boards' Resolutions

Approving IRP



**Beltrami Electric
Cooperative Inc.**

® Your Touchstone Energy® Partner 

4111 Technology Drive, NW
PO Box 488
Bemidji, MN 56619-0488
(218) 444-2540 (800) 955-6083

BOARD OF DIRECTORS
BELTRAMI ELECTRIC COOPERATIVE INC.

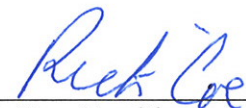
RESOLUTION

BE IT RESOLVED that the Board of Directors of Beltrami Electric Cooperative, Inc., after discussion and review of the Joint System 2014 Integrated Resource Plan (IRP) with Minnkota staff personnel, does hereby approve the said IRP.

CERTIFICATION

I, Rick Coe, President of the Beltrami Electric Cooperative, do hereby certify that the above resolution is a true and correct copy of the resolution as adopted by the Board of Directors of Beltrami Electric Cooperative, Inc. at their meeting held on April 30, 2014 and that said Resolution now appears in the records of our Minute Book without any changes or alterations.

-SEAL-

BY: 
Rick Coe, President



Cass County Electric Cooperative

Your Touchstone Energy® Partner 

Resolution No. 04-14-3

RESOLUTION CASS COUNTY ELECTRIC COOPERATIVE INC. APPROVAL OF 2014 INTEGRATED RESOURCE PLAN

WHEREAS, the 2014 Integrated Resource Plan (IRP) has been prepared for the Joint System by Minnkota Power Cooperative, Inc., and

WHEREAS, Minnkota has solicited comments from the member system, and


WHEREAS, Minnkota has presented and discussed the IRP with the Board of Directors.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of Cass County Electric Cooperative Inc. has reviewed the IRP and does hereby approve the said IRP.

CERTIFICATION OF SECRETARY

I, John Froelich, Secretary of Cass County Electric Cooperative do hereby certify that the above is a true and correct excerpt from the minutes of the meeting of the board of directors of the Cass County Electric Cooperative, held on the 28th day of April, 2014 at which meeting a quorum was present.

SEAL



John Froelich

CAVALIER RURAL ELECTRIC COOPERATIVE, INC.

1111 Ninth Avenue • P.O. Box 749 • Langdon, ND 58249-0749
Phone: 701-256-5511 • Fax: 701-256-5513

RESOLUTION

WHEREAS, the 2014 Integrated Resource Plan (IRP) has been prepared for the Joint System by Minnkota Power Cooperative, Inc., and

WHEREAS, Minnkota has solicited comments from the member system, and


WHEREAS, Minnkota has presented and discussed the IRP with the Board of Directors.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of Cavalier Rural Electric Cooperative, Inc. has reviewed the IRP and does hereby approve the said IRP.

CERTIFICATION

I, Steve Hart, certify that I am the Secretary of Cavalier Rural Electric Cooperative, Inc. Board of Directors and that the above is a true and correct copy of a resolution duly adopted at a regular board meeting of the Board of Directors of Cavalier Rural Electric Cooperative, Inc. held on the 23rd day of April, 2014 at which a quorum was present.

IN WITNESS WHEREOF, I have subscribed my name to this document
of April 23, 2014



Steve Hart, Secretary



A Touchstone EnergySM Cooperative 

P.O. Box 0
Bagley, MN 56621-1001
Phone (218) 694-6241
Toll-free 1-888-694-3833
Fax (218) 694-6245

RESOLUTION

BE IT RESOLVED that the Board of Directors of Clearwater-Polk Electric Cooperative, Inc., after discussion and review of the Joint System 2014 Integrated Resource Plan (IRP) with Minnkota staff personnel, does hereby approve the said IRP.

CERTIFICATION

I, Barbara Petersen, certify that I am the Secretary of the Clearwater-Polk Electric Cooperative, Inc. Board of Directors. I further certify that the above is a true excerpt from the minutes of a board meeting of this Board of Directors on the 30th day of April, 2014, at which a quorum was present and that the above portion of the minutes has not been modified or rescinded.



Signature of the Secretary

April 30, 2014

Date



NODAK ELECTRIC COOPERATIVE, INC.
Grand Forks, North Dakota


RESOLUTION No. 1704:

BE IT RESOLVED, that the Board of Directors of Nodak Electric Cooperative, Inc., after discussion and review of the Joint System 2014 Integrated Resource Plan (IRP) with Minnkota Power Cooperative staff personnel, does hereby approve the said IRP.

CERTIFICATION

I, Luther Meberg, do hereby certify that I am the Secretary of Nodak Electric Cooperative, Inc., and that the foregoing is a true and correct copy of a resolution, which was duly adopted by the Board of Directors at a meeting held on June 3, 2014. A quorum was present at this meeting.

IN WITNESS WHEREOF I have hereunto set my hand and affixed the seal of the Corporation this 3rd day of June, 2014.



Luther Meberg, Secretary/Treasurer

(Seal)



P.O. Box 719
Baudette, MN 56623
218-634-2202
1-888-634-2202
Fax: 218-634-2203

P.O. Box 371
Littlefork, MN 56653
218-278-6658
1-888-258-2008
Fax: 218-278-4748

e-mail: nsec@wiktel.com
www.northstarelectric.coop

2014 INTEGRATED RESOURCE PLAN RESOLUTION

WHEREAS, the 2014 Integrated Resource Plan (IRP) has been prepared for the Joint System by Minnkota Power Cooperative, Inc., and

WHEREAS, Minnkota has solicited comments from the member system, and

WHEREAS, Minnkota has presented and discussed the IRP with the Board of Directors,

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of North Star Electric Cooperative of Baudette Minnesota has reviewed the IRP and does hereby approve the said IRP.


CERTIFICATION



CHAIRMAN

APRIL 3 2014

DATE



SECRETARY

DATE



Electric Cooperative, Inc. A Touchstone Energy® Partner 

P.O. BOX 108 • 406 NORTH MINNESOTA STREET • WARREN, MN 56762-0108 • 218-745-4711 • 800-552-7366

RESOLUTION

"WHEREAS, the 2014 Integrated Resource Plan (IRP) has been prepared for the Joint System by Minnkota Power Cooperative, Inc., and

WHEREAS, Minnkota has solicited comments from the member system, and

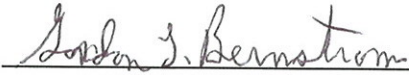
WHEREAS, Minnkota has presented and discussed the IRP with the Board of Directors.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of P.K.M. Electric Cooperative, Inc. has reviewed the IRP and does hereby approve the said IRP. "

CERTIFICATION

I hereby Certify that the above and foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of P.K.M. Electric Cooperative, Inc., at a meeting held May 27, 2014, and that said resolution has not been rescinded or modified and that the same is at the date hereof in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Cooperative this 27th day of May 2014.


Secretary/Treasurer



**Red Lake Electric
Cooperative Inc.**

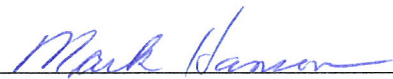
One of the Minnkota Power Systems

412 International Drive SW
PO Box 430
Red Lake Falls MN 56750-0430
Phone: (218) 253-2168
email: redlake@minnkota.com

RESOLUTION


BE IT RESOLVED on this 30th day of April, 2014, that the Board of Directors of Red Lake Electric Cooperative, after discussion and review of the Joint System 2014 Integrated Resource Plan (IRP) with Minnkota staff personnel, does hereby approve the said IRP.

Signed:



Mark Hanson Board Secretary

Witnessed:



Bonnie Christians Board President



**RED RIVER VALLEY
COOPERATIVE POWER ASSOCIATION**

P.O. Box 358 • Halstad, MN 56548

Phone: (218) 456-2139
Fax: (218) 456-2102
Toll free: 1-800-788-7784

AN EQUAL OPPORTUNITY EMPLOYER

**RED RIVER VALLEY COOPERATIVE POWER ASSOCIATION
2014 INTEGRATED RESOURCE PLAN
RESOLUTION**

BE IT RESOLVED that the Board of Directors of Red River Valley Cooperative Power Association, after discussion and review of the Joint System 2014 Integrated Resource Plan (IRP) with Minnkota staff personnel, does hereby approve the said IRP.

CERTIFICATE OF SECRETARY

I, Kay Green, certify that I am Secretary of the Red River Valley Cooperative Power Association Board of Directors and that the above and foregoing is a true excerpt from the minutes of a regular Board Meeting of the Board of Directors of the Red River Valley Cooperative Power Association, held on the 21st day of April, 2014 at which a quorum was present and that the above portion of the minutes has not been modified nor rescinded.

IN WITNESS WHEREOF, I have set my hand and affixed the seal of the Red River Valley Cooperative Power Association on this 21st day of April, 2014.

4-21-14
(Date)

Kay Green
Kay Green, Secretary



Roseau Electric Cooperative, Inc

A Touchstone Energy[®] Cooperative

1107 3rd St NE • PO Box 100

Roseau, MN 56751


Phone: 218-463-1543 • 888-847-8840 • Fax: 218-463-3713

Web: www.roseauelectric.coop • E-mail: rec@roseauelectric.coop

RESOLUTION

BE IT RESOLVED that the Board of Directors of Roseau Electric Cooperative, Inc., after discussion and review of the Joint System 2014 Integrated Resource Plan (IRP) with Minnkota staff personnel, does hereby approve the said IRP.

CERTIFICATION



(Signature of Secretary)

5-28-14

(Date)



502 North Main
PO Box 438
Mahnomon MN 56557-0438
Telephone: (218) 935-2517
FAX: (218) 935-2519

**WILD RICE ELECTRIC COOPERATIVE, INC.
MAHNOMEN, MINNESOTA**

RESOLUTION

WHEREAS, the 2014 Integrated Resource Plan (IRP) has been prepared for the Joint System by Minnkota Power Cooperative, Inc., and

WHEREAS, Minnkota has solicited comments from the member system, and

WHEREAS, Minnkota has presented and discussed the IRP with the Board of Directors.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of Wild Rice Electric Cooperative, Inc. has reviewed the IRP and does hereby approve the said IRP.

CERTIFICATION

I, Mark Habedank, Secretary of Wild Rice Electric Cooperative, Inc. do hereby certify that the above is a true and correct excerpt from the minutes of the regular board meeting of the Board of the Wild Rice Electric Cooperative, Inc., held on the 29th day of April, 2014, at which meeting a quorum was present.



Mark Habedank, Secretary

SEAL



Northern Municipal Power Agency

123 2nd St W • Thief River Falls, MN 56701-1912

TELEPHONE:
(218) 681-0963

WEBSITE:
www.nmpagency.com

RESOLUTION

WHEREAS, The 2014 Integrated Resource Plan (“IRP”) has been prepared for Minnkota Power Cooperative, Inc. Member Cooperatives and Northern Municipal Power Agency (“Joint System”) by Minnkota Power Cooperative, Inc., and

WHEREAS, Minnkota Power Cooperative, Inc. has solicited comments from Members of the Joint System, and

WHEREAS, Minnkota Power Cooperative, Inc. has presented and discussed the IRP with the Northern Municipal Power Agency Board of Directors,

Upon motion by Chris West and seconded by Lucas Spaeth, it was:

RESOLVED, That the Board of Directors of Northern Municipal Power Agency does hereby approve the IRP as presented.

PARTICIPATING MINNESOTA CITIES:

Bagley
Baudette
Fosston
Halstad
Hawley
Roseau
Stephen
Thief River Falls
Warren
Warroad

PARTICIPATING NORTH DAKOTA CITIES:

Grafton
Park River

**MINNKOTA POWER COOPERATIVE, INC.
GRAND FORKS, NORTH DAKOTA**

RESOLUTION NO. 3564 OF THE BOARD OF DIRECTORS

WHEREAS, Minnkota Power Cooperative, Inc. (Minnkota) is required to submit an Integrated Resource Plan (IRP) to the Minnesota Public Utilities Commission by July 1, 2014, on behalf of itself and Northern Municipal Power Agency (Northern).

WHEREAS, there has been full public participation in and specific approval of the 2014 IRP by Minnkota's Class A Member Cooperatives and Northern.

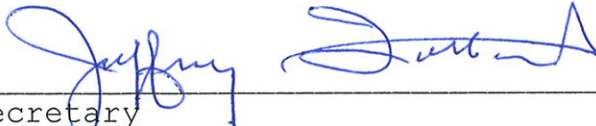
WHEREAS, Minnkota's Board of Directors has reviewed the IRP and the process by which it has been developed.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors does hereby approve the 2014 IRP and its submittal to the Minnesota Public Utilities Commission.

SECRETARY'S CERTIFICATE

I, Jeffrey Folland, do hereby certify that I am the duly elected, qualified and acting secretary of Minnkota Power Cooperative, Inc. and the keeper of its records, and that the attached is a true and correct copy of a resolution duly adopted at a meeting of the Board of Directors of said Corporation duly convened and held in accordance with its bylaws, on the 19th day of June, 2014, at which a quorum was present and acting throughout, and I do further certify that said resolution is still in force and effect and has not been repealed.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Secretary and affixed the corporate seal of said Corporation this 19th day of June, 2014.


Secretary

SEAL